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Order Instituting Rulemaking Concerning Energy Efficiency Rolling Portfolios, Policies, Programs, Evaluation, and Related Issues.	Rulemaking 13-11-005 (Filed November 14, 2013)

ASSIGNED COMMISSIONER AND ADMINISTRATIVE LAW JUDGE'S RULING REGARDING HIGH OPPORTUNITY ENERGY EFFICIENCY PROGRAMS OR PROJECTS

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ASSIGNED COMMISSIONER AND ADMINISTRATIVE LAW JUDGE'S RULING REGARDING HIGH OPPORTUNITY ENERGY EFFICIENCY PROGRAMS OR PROJECTS

Summary

This ruling adopts substantive standards and an expedited Commission review process for "high opportunity programs or projects," pursuant to Assembly Bill 802.

1. Procedural History

The October 30, 2015 "Assigned Commissioner and Administrative Law Judge's Ruling and Amended Scoping Memorandum Regarding Implementation of Energy Efficiency 'Rolling Portfolios' (Phases IIB and IIIA of R.13-11-005)" (Phase IIB/IIIA scoping memo) placed implementation of Assembly Bill (AB) 802 in scope for the proceeding. It established a process specifically for addressing "high opportunity programs or projects," along with other aspects of AB 802.

Pursuant to the Phase IIB/IIIA scoping memo, Commission Staff prepared a white paper regarding "High Opportunity Programs or Projects" (white paper). The assigned Administrative Law Judge (ALJ) issued the white paper for public comment via a ruling on November 4, 2015. Commission Staff conducted an informal public webinar on the white paper on November 17, 2015. Parties filed comments on the white paper on November 20, 2015.[1]

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[1] The following parties filed comments:

Brightline Defense Project

California Building Performance Contractors Association

California Energy Efficiency Industry Council

Footnote continued on next page

As also set forth in the Phase IIB/IIIA scoping memo, we are providing guidance now on High Opportunity Programs or Projects, so as to meet the January 1, 2016 legislative deadline for High Opportunity Programs or Projects implementation.

2. Guidance on "High Opportunity Projects and Programs" Under AB 802

2.1. AB 802

AB 802 provides that "Effective January 1, 2016, electrical corporations and gas corporations are authorized to implement the provisions of [Cal. Pub Util. Code § 381.2(b)] for high opportunity EE projects or programs."[2] AB 802 obligates the Commission is provide "expedited authorization of high

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California State Labor Management Cooperation Committee for the International of Electrical Workers

Ecology Action

EnergySavvy

FirstFuel Software Inc.

Home Energy Analytics

National Association of Energy Service Companies

Nest Labs, Inc.

Opower, Inc.

Organization of Ratepayer Advocates

Pacific Gas and Electric Company

San Diego Gas & Electric Company

Southern California Edison Company

Southern California Gas Company

Southern California Regional Energy Network

The Utility Reform Network

[2] Cal. Pub. Util. Code § 381.2(c). All statutory references are to the Public Utilities Code unless noted otherwise.

opportunity projects or programs" that flow from "apply[ing] the savings baseline provisions of [Section 381.2(b)]."[3]

Section 381.2(b) requires, in pertinent part, that the Commission shall:

> authorize electrical corporations or gas corporations to provide financial incentives, rebates, technical assistance, and support to their customers to increase the energy efficiency of existing buildings based on all estimated energy savings and energy usage reductions, taking into consideration the overall reduction in normalized metered energy consumption as a measure of energy savings.
>
> Those programs shall include:
>
> - Energy usage reductions resulting from the adoption of a measure or installation of equipment required for modifications to existing buildings to bring them into conformity with, or exceed, the requirements of Title 24 of the California Code of Regulations, as well as
> - Operational, behavioral, and retrocommissioning activities reasonably expected to produce multi-year savings.
> - Electrical corporations and gas corporations shall be permitted to recover in rates the reasonable costs of these programs. The commission shall authorize an electrical corporation and gas corporation to count all energy savings achieved through the authorized programs created by this subdivision, unless determined otherwise, toward overall energy efficiency goals or targets established by the commission.[4]

In sum, we must expeditiously authorize "high opportunity programs or projects" that implement the provisions of Section 381.2(b).

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[3] Cal. Pub. Util. Code § 381.2(c).

[4] Section 381.2(b) (bullets and paragraph breaks added for clarity).

Our goal in defining "high opportunity programs or projects" is to establish a universe of activities that will fall under whatever full definition(s) we ultimately adopt in implementing Section 381.2(b). That is, we will identify "high opportunity" interventions clearly within Section 381.2(b)'s ambit before fully fleshing out Section 381.2(b)'s requirements.

In addition to determining what "high opportunity programs or projects" are, and how to authorize them, we will address several ancillary issues relating to such "programs or projects" including:

1. Preliminary interpretation of the phrase "estimated energy savings and energy usage reductions, taking into consideration the overall reduction in normalized metered energy consumption as a measure of energy savings;"
2. How to determine the cost-effectiveness of such programs and projects;
3. Customer incentive levels and timing;
4. How to evaluate, measure, and verify savings from such programs and projects ex post;
5. How to set shareholder incentives for such programs and projects.

2.2. Overarching Principles for Implementation

AB 802 sets up a two-step process for its implementation. High Opportunity Programs or Projects are "authorized" as of January, 2016. The idea behind High Opportunity Programs or Projects is that some newly-permissible or mandated energy efficiency activities need not or should not await the Commission's full explication of section 381.1(b). Full implementation is to happen by September.

This ruling applies only to High Opportunity Programs or Projects. Nothing here should be read to pre-judge what the Commission will adopt in September.

Program Administrators (PAs) should submit High Opportunity Programs or Projects proposals with the following principles in mind:

- 381.2(b)'s stated goal is to "increase the energy efficiency of existing buildings." Therefore High Opportunity Programs or Projects should focus on existing buildings.
- In designing High Opportunity Programs or Projects, PAs should draw from the wealth of saturation studies, pilots, EM&V, and other analysis, to find and propose clear winner projects/programs. Similarly, PAs should look to these sources, to decide what *not* to pursue as High Opportunity Programs or Projects.
- High Opportunity Programs or Projects should focus on energy efficiency activities *newly permissible under the 381.2(b) changes*.
    - High Opportunity Program or Projects should reach "stranded potential" via AB 802's new approaches to valuing and measuring savings.
    - While we do not foreclose modification of existing programs, High Opportunity Programs or Projects proposals should focus on interventions (and associated intervention strategies, savings measurement regimes, and program designs) that 381.2(b) authorizes that PAs could not do previously.

There are some practical considerations that will limit the scope of High Opportunity Programs or Projects. First, there are only a few months between the January start for High Opportunity Programs or Projects and the Commission's pre-September decision on AB 802 rules more generally. Many of the same Commission Staff working on the fuller implementation of AB 802 and Senate Bill (SB) 350 and on the other issues called out in the Phase IIB/IIIA

scoping memo are the same Commission Staff working on High Opportunity Programs or Projects. Staff bandwidth (and the lack of it) is a factor in how we approach High Opportunity Programs or Projects.

Second, AB 802's two-step structure, coupled with companion bill SB 350's focus on integrated planning, indicates that the legislature expects us to plan energy efficiency portfolio holistically, as part of an integrated procurement planning process. A corollary is that the legislature does not appear to want to see major pieces of the energy efficiency portfolio redesigned *ad hoc*. As noted earlier, we will be taking the legislatively-directed integrated look at energy efficiency portfolios in the business plan applications coming by September.

Finally, we are establishing a process here that allows for many types of interventions. It is up to PAs in the first instance to decide which sectors, programs, and measures to pursue as High Opportunity Programs or Projects. We are expressly not singling out any particular market sectors, program types, or measure types for High Opportunity Programs or Projects proposals.

3. High Opportunity Programs or Projects Rules

3.1. Summary of Responses to Comments

As noted in Section 1, we solicited party comments on the Commission Staff white paper. We summarize below where the foregoing principles take us in response to the major issues parties raised in comments.

Issue From Comments	Adaptation/Change in Ruling
Repair and Maintenance Commenters took issue with what was characterized as the white paper's requirement that customers bring equipment up to a "normal" level of repair prior to eligibility; and for adjustments to baselines to reflect normative rather than actual repair	Allows repair/maintenance to count for savings without a baseline adjustment for "normal" maintenance, and allows incentive payments for repair/maintenance. This allowance comes with qualifications: any incentive for repair/maintenance must

practices.	be coupled with multi-year contracts for on-going maintenance, and with documentation of what is done. (e.g., of maintenance contracts and/or training) Additional new language references how other jurisdictions have addressed repair/maintenance issues in their energy efficiency programs.
Replace on Burnout The white paper proposed a "code baseline"[5] for measures replaced on burnout that would have to be replaced with at least at-code new equipment. A number of commenters noted that while this might be appropriate for some equipment, other equipment could be repaired indefinitely, or exceeded the calculated "expected useful life" (EUL) for the category of equipment, and so should receive more favorable treatment.	Allows for replace on burnout measures to qualify for incentives and savings credit where the program or project proponent makes a data-supported case that the equipment at issue has a history of being repaired indefinitely or generally lasts longer than the currently adopted EUL.
Single Measures Commenters argued for allowing single measures so as to capture savings opportunities associated with large equipment replacements.	Allows for single measures if they are likely to be large enough to "show up" in the modeling/metered approach.
Deemed Measures Original language was perceived as missing high opportunities by not allowing deemed approaches (instead focusing on metered results)	Allows for the possibility of deemed measures, but notes that developing new ex ante savings estimates in the High Opportunity Programs or Projectstime frame will be difficult, and

[5] For an explanation of what a "code baseline" is, *see* D.14-10-046 at 52-57 (*Baseline* is: "The state of performance and/or equipment that what would have happened in the absence of the program induced energy efficiency." *Code baseline* is the baseline that "regulations, codes, and/or industry standard practices dictate - not what existing conditions happen to be.")

	so encourages a focus on meter-based programs/projects.
10% Threshold for Savings Original language seemed too restrictive, and some parties misinterpreted this as a "requirement" but it was intended as aspirational	Notes that 10% savings is a preference, not a requirement.
10% Budget Cap Original language was perceived by some as too restrictive and additional clarification was requested.	Notes that 10% of annual spending is $100,000,000 dollars per year; concludes that this is a reasonable cap on *ad hoc*, expedited review programs/projects to be approved in the next eight months, especially since an integrated, holistic, set of revisions to energy efficiency portfolios are only a few more months away.
Project/Program Proposal Review Several commenters expressed concern about the review process, and that it too closely resembled current ex ante processes.	Simplifies/clarifies the expedited review process.
Submetering Many parties advocated for allowing submetering.	Submetering is permissible.
Require RFP? Some parties asked for RFP process for the IOUs as the means to make proposals.	Does not require RFPs.
1 year of customer data prior to claiming savings for programs/projects where savings are based on net metered energy consumption. Some parties thought this was too long.	Maintains the one-year-of-data requirement for High Opportunity Programs or Projects, consistent with treatment for current metered program

	design approaches (e.g., OPower).
3 year for behavioral, retrocommissioning, and operational savings reporting Same as above.	Notes that AB 802 contemplates "multiyear" savings from behavioral, retrocommissioning, and operational programs/projects; shortens waiting period to claim savings from three to two years (we still want to ensure the persistence AB 802 seeks), trued up for ESPI purposes.
Industrial Process Improvements Some argued to include industrial process interventions in the opportunities	Limits High Opportunity Programs or Projects to improvements in the efficiency of existing buildings, per AB 802's express language. Notes that industrial process programs or projects may be considered as part of the broader changes to portfolios later in 2016.
Gut Rehab Parties asked for clarification of the phrase, and were concerned that excluding gut rehab programs/projects is contrary to the legislature's intent.	No longer defined separately, since the gut rehab classification is part of the new construction definition, and is already the subject of "savings by design" programs.
Existing Programs Parties asked for clarification as to whether High Opportunity Program or Projects had to be new programs; or if old programs could qualify.	For High Opportunity Programs or Projects, we strongly prefer innovative new programs, not just changes to the incremental measure cost and savings claims for existing programs (see above re deemed savings and the technical challenges associated with revisions to deemed savings levels). The ruling nonetheless allows for resubmittal as High Opportunity Programs or Projects

	extant programs that have a significant re-design.

3.2. Definition of High Opportunity Programs or Projects:

High Opportunity Programs or Projects may include programs and projects in residential and non-residential sectors. High Opportunity Programs or Projects proposals should emphasize measurement of the effects of interventions as detailed in Attachment A. High Opportunity Programs or Projects may either be:

1. Interventions, including but not limited to behavioral, retrocommissioning, and operational interventions as well as traditional capital investment programs, where:
   a. The program or project uses as the basis for PA savings claims *ex post* data based on normalized metered energy consumption; and,
   b. If the program or project provides a customer incentive payment, the customer incentive reflects the performance of the program or project intervention.

   Or:
2. Deemed measures that meet all of the following criteria:
   a. can be reasonably defined as "repair indefinitely,"
   b. savings potential below-code is "stranded" and
   c. there are re-approved deemed savings values (either in the Database for Energy Efficiency Resources (DEER) or in Commission-Staff approved workpapers[6]).

All High Opportunity Program or Projects must incorporate a measurement and verification (M&V) plan. All High Opportunity Programs or

[6] We establish an expedited process for new High Opportunity Programs or Projects-related workpapers below.

Projects must also meet the additional submission requirements and M&V protocols set out in this ruling.

3.3. Portfolio Framework Considerations for High Opportunity Program or Projects

SB 350 mandates an integrated approach to the Commission's load serving activities, including demand-side activities such as energy efficiency programs and projects.[7] We are expecting PAs to take an integrated approach to energy efficiency in the business plans PAs will file in September.

The legislative mandate for integration, coupled with (a) the short time for High Opportunity Programs or Projects and (b) constraints on staff availability to review High Opportunity Programs or Projects proposals means that we must impose some limitations around what High Opportunity Programs or Projects will be, as distinct from what we will consider in September.

1) **Budget:** To fund High Opportunity Programs or Projects, PAs may draw down unspent funds, take funds from existing programs (aka "fund shifting"), or use funds authorized for PA (as distinct from Commission) EM&V studies. We will adopt Commission Staff's 10% budget cap proposal. This allows for up to approximately *$100,000,000* in High Opportunity Programs or Projects spending during the ~8-month window that this High Opportunity Programs or Projects framework will be in place. This is a reasonable limit on funding for High Opportunity Programs or Projects given the need to integrate High Opportunity Programs or Projects into our fuller implementation of AB 802 and SB 350 in just a few months. Further, it is impractical for Commission Staff or PAs to manage a greater volume of program changes between now and September. Relatedly, we have not yet

[7] *See* Pub. Util. Code § 454.52.

changed goals to reflect the new paradigm that AB 802 and SB 350 are introducing.

2) **Goals:** We will not adjust goals now. There is no basis for forecasting savings from High Opportunity Programs or Projects. PAs may apply High Opportunity Programs or Projects savings toward current goals, *ex post*.

3) **Cost-Effectiveness:** Current cost effectiveness methodologies apply. As Commission Staff pointed out, the *Standard Practice Manual defines the measure cost for an existing condition baseline to be the full measure cost*.

4) **Savings Claims:** For PA savings claims based on reductions in net metered energy consumption, PAs will claim savings on an *ex post* basis. If PAs use deemed savings estimates, PAs shall claim savings on an *ex ante* basis. (*See,* 6), below.

5) **Evaluation, Measurement and Verification (EM&V) Process:** High Opportunity Programs or Projects proposals shall include their own measurement and verification, for both metered and deemed approaches. In either case, the Commission will conduct an independent EM&V process in order to verify the effectiveness of the different models implemented as High Opportunity Programs or Projects. Commission-led *ex post* third party evaluation activities will focus on reviewing models, methods, and results, and may include field verification as needed. Deemed savings estimates will be subject to pre-review as well as ex post evaluation, as is current Commission practice.

6) **Energy Savings and Performance Incentive (ESPI) Payments:** IOU energy savings claims for High Opportunity Programs or Projects will be classified as "uncertain" and receive ESPI payments on an *ex post* basis. Methods for reporting lifecycle savings need to be consistent with existing policy. Commission Staff shall revise the ESPI coefficients and the caps for each incentive category to reflect the 2016 goals and budget authorization. Until the Commission develops a method for estimating the persistence of behavior, retrocommissioning and operational measures, the Expected Useful Life (EUL) for these savings will be 1 year, consistent

with the current policy for behavioral programs such as Opower.

3.4. General Project/Program Design Requirements:

The intention of the High Opportunity Programs or Projects framework is to leave the program or project design open-ended. Program and project submission requirements will enable the Commission to gather sufficient information about the proposed projects and programs from the outset to understand each implementer's approach. From there we can assess how each approach performs, and also use what we learn from the approach to inform adoption of a broader AB 802 framework by September 2016.

3.4.1. Definitions of Project and Program:

For the purpose of filing requirements and review process, project and programs are defined as the following:

a) A *project* is implemented for or by a single customer/facilities owner, which may involve more than one building. Specific buildings and interventions have been established at the time of the proposal and specific savings estimates may be provided.

b) A *program* is managed by an implementer who plans to identify and sign up customers to receive a proposed intervention. Since the implementer does not know at the outset what customer participants or measures may be included, the High Opportunity Programs or Projects proposal should be more developed in its integration of the program strategy with its measurement and verification plan.

3.4.2. Program Design Requirements for Projects Using Deemed Measures

In comments on the white paper, several Parties asked us to allow High Opportunity Programs or Projects to include "deemed"[8] measures. These parties contend that there are some interventions that changes to baseline policy now make attractive to PAs, and that PAs should be able to incentivize these measures (and claim savings from them) on a deemed basis.

We will allow for limited inclusion of deemed measures in High Opportunity Programs or Projects. The easy measures to allow are those measures for which there is already a Commission-approved DEER or non-DEER workpaper value that attributes savings from an existing conditions baseline (e.g., various residential measures).

The more challenging question is what to do about deemed values where no Commission-approved deemed values currently exist. Use of existing conditions baseline with deemed measures raises a host of complex questions that we have not fully explored. In the most recent instance where the Commission set deemed savings values for measures using an existing conditions baseline, establishing those values proved controversial.[9] Moreover, from start (data gathering) to finish (new DEER values approved by the Commission), establishing *ex ante* savings values generally takes considerably longer than this High Opportunity Programs or Projects framework will be in place.

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[8] "*i.e.*, measures with predetermined savings and costs." D.10-04-004 at 10.

[9] *See* D.15-10-028 at 106-111 (establishing new DEER values for refrigerator and freezer recycling programs).

We want to be practical here. We will allow High Opportunity Programs or Projects to include some deemed measures with new deemed savings values. But these measures should be few in number and *very* high-impact. We discuss how PAs should propose new deemed savings estimates below.

3.4.3. Requirements for Projects using Normalized Metered Energy Consumption

3.4.3.1. Qualifying Measure/Whole Building Treatment

We will not be prescriptive about what measures qualify or are excluded from High Opportunity Programs or Projects. We *prefer* to see whole building (or house), multi-measure, deep retrofit approaches that result in significant, clearly detectable impacts at the meter. *However*, single measures are permissible where likely to produce large bill savings (e.g. central heating and cooling systems) for a single customer, or large aggregate savings if aggregated across multiple customers. Program proposals could include interventions for large groups of participants where savings are determined *ex post* at the program level.

We will not entertain High Opportunity Programs or Projects focused on a single measure for a single site that would not have a detectable impact for the customer (e.g. a single light bulb replacement in a commercial building). Also, High Opportunity Programs or Projects should not include projects or programs considered "New Construction" as per the definition included in the Savings by Design Program Manual.[10]

Some commenters took issue with the white paper's proposal to exclude "replace on burnout" measures from High Opportunity Programs or Projects.

[10] New Construction definition as per Savings by Design 2015 Program Manual: http://www.savingsbydesign.com/book/savings-design-online-program-handbook#booknode-437

Commission Staff notes that in general when something burns out the only replacement option is at or above code. In that case, continues Commission Staff, there is no reason for ratepayer incentives (or savings credit to PAs) for replacement at a code level, since it would have happened anyway.

Commenters counter that in at least some instances, for at least some classes of equipment (e.g., boilers, some electric motors), customers will repair the ostensibly "burnt out" equipment indefinitely. According to these commenters, it is appropriate to incentivize replacement in these instances to drive inefficient but repairable equipment out of use in favor of more efficient equipment.

We are not going to be able to resolve the complexities around replace on burnout in this ruling. It is a larger matter best addressed in the Commission's full decision on AB 802 implementation. For now, we will impose some reasonable limits on claims/incentives for replace on burnout to ensure that the focus is on "high opportunity" measures.

If PAs want to provide incentives and/or claim savings for replace on burnout measures, they need to make a data-supported case in their High Opportunity Programs or Projects proposal that a given piece of equipment has a history of being repaired rather than replaced. Parties seem to have specific equipment types and/or building uses in mind, and should bring programs/projects for that equipment and building use to us along with supporting information justifying use of an existing conditions baseline.

3.4.3.2. Threshold for expected savings

We do not impose any minimum requirement for expected savings for High Opportunity Programs or Projects. While we encourage proposals with

forecast savings of at least ten percent of baseline consumption levels, we do not require that savings level.

Measuring savings at the meter offers a significant opportunity to demonstrate savings in close to real time. However, we share Commission Staff's concern that it will be difficult to demonstrate what impact small-scale interventions (e.g., replacement of a single light bulb in a commercial building) have on energy consumption. We are also concerned about possible negative savings (i.e., increased consumption) appearing at the meter, as when non-intervention changes in some aspect of energy consumption overwhelm savings from an intervention. For example, the increased energy use from an additional resident moving into a home may offset savings from more efficient lighting. High Opportunity Programs or Projects with a meter-based savings component shall address risk management by 1) including an M&V model, and 2) making appropriate adjustments for measurement error for a given project or program design (e.g., establishing ranges for confidence intervals that are sufficient for making verified savings claims). Ultimately we want the interventions to have a noticeable and quantifiable effect on energy usage.

Proposals that are based on deemed measures may have a smaller absolute savings value, but the proposal should explain why, and provide data to support the argument that a measure's savings potential is stranded (e.g., documentation that there is a history of this equipment being repaired rather than upgraded to code upon burnout).

3.4.3.3.Customer Incentive Design

The timing of customer incentive payments need not mirror the timing of PA savings claims. That is, PAs may pay incentives for savings that the PA may not yet claim, as with an up-front payment for a portion of the expected savings

value, followed by performance-based payments. There may be other combinations of staggered incentives over time that are appropriate to consider.

High Opportunity Programs or Projects may feature a variety of incentive structures. They might not provide any customer incentives at all, as with current residential behavior programs. They may also use project financing, Standard Performance Contracting, or other Energy Service Company (ESCO) models. We expect only that the payment strategy reflect an accurate valuation of the savings:

1) Where savings claims are based on normalized metered energy consumption, customer payment must be at least in part based on *ex post* data from changes in normalized metered energy consumption.

2) Pay for performance incentive designs must:

a) Use at least one year of pre installation usage data to establish a usage baseline;[11]

b) provide for at least one year of ex post measurement, and,

c) account for the length of time the savings are expected to persist.

3) Payment structure should mitigate the risk of up-front payments exceeding the value of actual savings.

4) For proposals basing savings claims on net metered energy consumption, we will not require projects to demonstrate that

[11] Several commenters on the Commission Staff white paper opposed this requirement. We are adopting it for High Opportunity Programs or Projects in order to avoid complicated methodological issues around how to determine a usage baseline for customers without a year-round track record. Normalizing consumption even with at least a year's worth of usage data poses a large enough methodological challenge for the HOPPs timeframe.

As with all things High Opportunity Programs or Projects, this is without prejudice to taking a different approach for September.

they are early retirement, or to adjust baselines to account for replace on burnout.

5) Standard building repair and maintenance need to be accounted for, with baseline savings adjustments specified to reflect the customary customer activity in the absence of the program intervention.

3.4.4. PA Savings Claims

PAs may claim savings based on normalized metered energy consumption only on an ex *post* basis. Where program and project savings are to be "metered," by necessity the claims must come in after an intervention has occurred and has been metered for a minimum period to assure savings. As the Commission adopted with the Home Energy Reports programs (a.k.a. OPower), a minimum period of 1 year of post-intervention measurement allows for capture of seasonal variation in energy consumption.

Behavioral, retrocommissioning or operational (BRO) interventions must be reasonably expected to "produce multi-year savings."[12] Research on the persistence of retrocommissioning measures shows savings start degrading after three years. [13], Accordingly, behavioral, retrocommissioning and operational interventions must, in addition to the requirements of the preceding paragraph,

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[12] Section 381.2(b) ("programs shall include energy usage reductions resulting from the adoption of . . . operational, behavioral, and retrocommissioning activities *reasonably expected to produce multiyear savings*") (emphasis added).

[13] Bourassa, N.J., M.A. Piette, N. Motegi. 2004. Evaluation of Persistence of Savings from SMUD Retrocommissioning Program – Final Report. LBNL-54984; Turner, W.D., Claridge, D.E., Deng, S., Cho, S., Liu, M., Hagge, T., Darnell, C.,Jr., and Bruner, H., Jr. 2001. "Persistence of Savings Obtained from Continuous Commissioning." National Conference on Building Commissioning, Cherrry Hill, NJ., May 9-11, Session 20, Paper 1, 13 pp; Meiman, A., Anderson M., Brown, K., 2012. "Monitoring-Based Retrocommissioning: Tracking the Evolution and Adoption of a Paradigm-Shifting Approach to Retro-Commissioning." ACEEE 2012 Summer Study Proceedings.

demonstrate metered savings for a minimum of two years. PAs may begin claiming savings the first year after the intervention, but savings claims will be trued-up on an ex-post basis after two years and each year thereafter to ensure persistence and multiyear savings. PAs must report energy savings claims at year two, to assure reasonable persistence. Until the Commission addresses the plethora of persistency and savings claim accounting issues that arise with BRO measures, EUL for BRO measures will be 1 year for High Opportunity Programs or Projects for the purposes of lifecycle savings estimates for ESPI and for GHG reductions.

PAs must provide program or project lifecycle savings estimates for forecasting and cost-effectiveness purposes. Proposed programs and projects should forecast the lifecycle savings per existing Commission rules regarding total lifecycle (no more than 30 years) and include the rationale for any lifecycle estimated for an intervention. The forecast longevity of the impact should be grounded in evidence from past studies or data collected from the field. The expected useful life of these measures should be tied to how long the PA will measure savings. The M&V period should be a minimum of two years.

Commission staff will continue to conduct *ex post* evaluation measurement and verification, but the points of intervention and nature of review may differ from current practice. After the program or project has been deployed, the reported savings based on the data collected will be reviewed by evaluators for accuracy.

Final evaluated savings may include true ups with other programs to avoid double counting. In addition to verifying savings, other evaluation activities may be needed to understand the effectiveness of the program and its incremental impacts.

3.4.5. The Intersection of Behavioral, Retrocommissioning, and Operational Programs/Projects with Regular Maintenance

We share Commission Staff's concerns about the grey area between what constitutes "regular maintenance and operation" of a building and "behavioral, retrocommissioning and operational" measures.[14] Retrocommissioning and custom programs in other jurisdiction distinguish among such measures, and quite a few jurisdictions disallow incentive payments for measures considered regular maintenance and repair (*see* Attachment C).

While on the one hand we do not want to put ratepayers in the position of paying for routine maintenance that most building owners already currently perform, on the other hand we have the "play it as it lies" gestalt of AB 802/SB 350 suggesting that if such maintenance is not happening and we can make it happen via programs or projects, we should do so.

We will not resolve this tension fully in time for High Opportunity Programs or Projects. We have no data on the extent to which building owners do or do not perform particular routine maintenance tasks, or the extent to which funding such maintenance will lead to additional free ridership.

For High Opportunity Programs or Projects purposes, we will allow customer incentives and PA savings claims for maintenance, with the following caveats. (1) PAs may only pay customer incentives for maintenance after program participants or project owners commit to a maintenance plan for a minimum of three years, (2) program participants or project owners must commit to carry out a minimum set of improvements based on criteria

[14] California Retrocommissioning Guide: Existing Buildings p.6, available at http://www.documents.dgs.ca.gov/green/commissionguideexisting.pdf

established by the PA, and 3) any customer incentives PAs pay for maintenance activities (alone or when bundled with other measures) must be based on ex post meter-based savings verification, and not based on any deemed savings. PAs shall include training components in maintenance program offerings in order to ensure participants understand the value of preventive maintenance and good operational practices.

3.4.6. Normalized Metered Energy Consumption and Reporting Guidelines:

Normalized metered energy consumption is not a new concept. In the white paper, Commission Staff reviewed the existing sources for EM&V protocols (listed in Attachment B), considered current practice, and offered lessons learned to propose a consensus definition for the "normalized metered energy consumption." and the key information needed to assess proposals.

In defining the phrase "normalized metered energy consumption," our intent is to:

1) Set consistent technical interpretation of measurement terms to allow for comparability of results and repeatability of methods for transparency in the market and regulatory process;

2) Provide resources and references for the definitions and guidance to improve understanding around current measurement methods and best practices;

3) Clarify expected use of measurement terms to ensure reasonable, feasible and cost effective proposals emerge in the first round;

The Commission will revisit the measurement guidelines based on lessons learned from the High Opportunity Programs or Projects, and possibly refine the guidelines for wider implementation of AB 802;

Projects and programs proposed to claim savings based on "normalized metered energy consumption" must comply with the definitions and guidelines provided in Attachment A. The table in Attachment A provides definitions, detailed considerations and reference materials to be used in the development of and documentation for programs and projects presented to the Commission for approval.

3.5. PA Filing Requirements

Starting on January 1, 2016, PAs may submit proposals for programs or projects with the documentation identified below, and as specified in Attachment A. This list of filing requirements is applicable to either an individual project or a program[15] and will generally supplement the basic submission requirements for new program or a custom project application.

Several parties recommended that PAs be required to issue a competitive solicitation for High Opportunity Programs or Projects. Whatever the merits of this concept, it is impractical; there is not sufficient time for PAs to develop and release an RFP, implementers to prepare bids, and for the bids to be reviewed and awarded before September 1. PAs shall work with implementers to support the development of High Opportunity Programs or Projects.

1) **General Program Description**

   a) Provide general description of the intervention strategy employed, with reference to the type of known existing business model being employed, (e.g. Standard Performance Contracting, ESCO models,

[15] There is no need to file for each project within a program. Just for standalone projects analogous to custom projects.

retrocommissioning, experimental design, or financing), Provide specifics on the terms of the proposed structure.

b) How does the project/program proposal address past challenges that have arisen with the business model being employed?

2) Measure Treatment

a) Measures and end uses that will be addressed—describe what type of intervention activities will be applied to what measures. If implementers propose to use deemed savings values, then the DEER value applicable to the site's existing condition baseline treatment must be identified (or an alternative workpaper offered per the California Technical Forum (CalTF) vetting process described herein).

3) Saving Calculations Method

a) For normalized metered energy consumption, detailed description of the savings calculation methods and provide access to models used for addressing normalized, metered and energy consumption, detailed in Attachment A.

b) For deemed savings projects that are providing incentive payments based on ex ante values, standard custom project savings calculation methods apply.

4) Incentive Design (if applicable)

a) Basis and rationale for payment structure--Explain the payment structure, including the basis for setting the upfront payment (if any) and how the structure mitigates the risk that potential upfront payments do not overrun the value of the realized savings.

b) Measure costs and capital burden—Identify the estimated capital costs and what portions of costs are to be borne by ratepayer and by implementer.

c) Partial or incremental payments with true up over time—Describe the terms and schedule of the incentive payments.

d) Strategy for tracking persistence—describe the long term tracking and reporting strategy for sustained savings with ongoing feedback.

3.6. Procedures for Review

Commission Staff will prioritize High Opportunity Programs or Projects for expedited review. Commission Staff should aim to keep review time (that is, the time that the proposal is in Commission Staff's custody, excluding the time during which nonconforming or incomplete proposals have been returned to a PAs' custody for revision/completion) limited to 21 days. Limitations on Commission Staff's availability require this timeline to be flexible, however.

Commission Staff shall develop a publicly-accessible review queue that provides twice-monthly status updates on Commission Staff's High Opportunity Programs or Projects proposal review.

We are adopting separate processes for Commission review of *programs* and for Commission review of *projects*.

1) **Programs:** PAs shall submit program proposals as Tier 1 Advice Letters. PAs shall include in each advice letter the information directed in this ruling. Once a program is approved (and for programs that become effective pending disposition), the PA shall file an implementation plan on EE Stats, consistent with the guidance in D.15-10-028. Any proprietary models included with High Opportunity Program or Projects submission may be held as confidential and made available only for Commission technical review if necessary. If a PA wants to propose modifications to an existing

program, it will need still file a High Opportunity Programs or Projects submission, and classify the funds separately in the annual advice letter filings and provide updated implementation plans.

Saving assumptions for deemed measures not already in DEER or in an approved workpaper shall be offered to the California Technical Forum (CalTF)[16] for review and submitted in new or updated workpapers after CalTF review.

Commission Staff review of High Opportunity Programs or Projects submitted by PAs (including CalTF-reviewed workpapers for new deemed measures) will be conducted by a panel of experts. For net metered energy consumption programs/projects, the panel will include Commission Staff, a technical advisor under contract with the Commission, and an EM&V consultant under contract with Commission. For deemed and calculated savings programs/projects, an *ex ante* consultant under contract to the Commission will replace the EM&V consultant on the panel.

2) **Projects:** Individual projects should be submitted as custom projects. Submittals shall include the information detailed in Attachment A. For projects that use normalized metered energy consumption, staff will not perform the standard engineering workpaper review, and will instead only review ex ante savings estimates to consider whether they are within a reasonable range to meet the expectations of the project

[16] The CalTF describes itself as "a collaborative of technical experts who use independent professional judgment and a transparent, technically robust process to review and issue technical information related to California's integrated demand side management portfolio." (Motion of the California Technical Forum Staff (Cal TF Staff) Requesting Party Status at 2 (filed April 8, 2015).) CalTF offers, among other things, its assistance with "updating ex ante values, changes to the workpaper process, [and] suggestions for improving workpaper quality." (Id. at 1). High Opportunity Programs or Projects offer a chance for us to pilot greater CalTF involvement in the *ex ante* process. Accordingly, we direct PAs to obtain CalTF review of any new or updated ex ante values PAs proposed for use in High Opportunity Programs or Projects. Commission Staff should give CalTF-reviewed workpapers due consideration in the program/project evaluation process.

design. The primary component of the workpaper review will be to ensure that the approach to measuring ex post savings is consistent with EM&V protocols as referenced in the appendix.

Saving assumptions for deemed measures not already in DEER or in an approved workpaper shall be offered to the CalTF for review, and submitted in new or updated workpapers after CalTF review.
High Opportunity Program or Project Commission Staff review of High Opportunity Programs or Projects programs submitted by PAs (including CalTF-reviewed workpapers for new deemed measures) will be conducted by a panel of experts. For net metered energy consumption programs/projects, the panel will include Commission Staff, a technical advisor under contract with the Commission, and an EM&V consultant under contract with Commission. For deemed and calculated savings programs/projects, an ex ante consultant under contract with the Commission will replace the EM&V consultant on the panel.

4. Integration of "High Opportunity Programs or Projects" Into Energy Efficiency Portfolios, And A Sunset For The High Opportunity Programs Or Projects Approach

As AB 802 directs, the Commission will replace the High Opportunity Programs or Projects framework with a broader framework implementing AB 802 of all programs, projects, and portfolios by September 1, 2016. The framework this ruling adopts is only for the interim between now and September 1, 2016. That said, once High Opportunity Programs or Projects are approved, they will be "grandfathered," and can remain in PA portfolios as long as their performance warrants. As explained at the outset of this ruling, our goal in designing the High Opportunity Programs or Projects framework is to build programs/projects that will fit into whatever larger edifice the Commission adopts in fully implementing AB 802.

5. PG&E's Examples – What Passes the High Opportunity Programs or Projects Screens and What Does Not

In response to the white paper, PG&E helpfully provided examples of what it had in mind for High Opportunity Programs or Projects. We appreciate the opportunity to provide feedback on these conceptual proposals now, ahead of the submittal of full-blown High Opportunity Programs or Projects proposals.

PG&E Concept[17]		High Opportunity Program or Projects?
Residential Pay-for-Performance		Yes. Focused on buildings. Multi-measure. Uses net metered energy consumption as the basis for savings. Pay for performance. Contains behavioral and operational elements.
Market Sector	Residential	
Measurement	Meter-based pre/post	
Incentive structure	Pay-for-performance to implementer	
Measure type	Multi-measure	
Intervention strategy	Selected aggregators would work with residential customers to achieve energy savings through their choice of operational, behavioral and/or retrofit activities. The participating homes' energy savings are then summed together to determine the aggregator's portfolio performance. The	

[17] From PG&E Comments at 4-6.

	aggregator would be paid a set $/therm and $/kWh rate annually for a set period of time.	
Commercial Pay-for-Performance		Yes. Focused on buildings. Multi-measure. Uses net metered energy consumption as the basis for savings. Pay for performance. Contains behavioral and operational elements.
Market Sector	Commercial	
Measurement	Meter-based pre/post or calibrated simulation	
Incentive structure	Pay-for-performance to customer	
Measure type	Multi-measure	
Intervention strategy	Builds upon the innovative Commercial Whole Building (CWB) Demonstration to create a scalable vehicle to cost-effectively procure energy savings in commercial buildings. Measures include equipment retrofit, retrocommissioning, automation-driven and behavioral measures. Incentives are tied to post-installation savings estimated using interval meter and other data over an extended period of time, typically 12 months before and	

	after project implementation.	
Whole Industrial Facility **Market Sector** **Measurement** **Incentive structure** **Measure type** **Intervention strategy**	Industrial Sub-metered normalized consumption Payment to customer after post installation verification Single or multi-measure based on sub-metering analysis The subprogram would conduct sub-metering and audit analysis in participating industrial facilities to identify and implement energy saving retrofit, behavioral, and operational measures in load intensive processes. Interventions would be coupled with sustained coaching of facility staff and tracking of the savings to ensure that savings are maximized and persistent. Incentives would be paid 6	No. Has most High Opportunity Programs or Projects elements, but industrial "*process* interventions" as proposed here will not "increase the energy efficiency of *existing buildings*," as AB 802 contemplates. Though not a High Opportunity Program or Project, this certainly merits consideration for September.

	months after installation, which is a sufficient period to review persistence of savings normalized to production.	
Financing **Market Sector** **Measurement** **Incentive structure** **Measure type** **Intervention strategy**	Commercial Meter-based pre/post Financing only; no incentive Single or multi-measure at customer discretion On-Bill Financing (OBF) is a revolving loan fund that, since 2011, has originated $56M in loans, of which $23M have already been repaid by customers ('revolved') and are available for additional loans. OBF supports hard-to-reach customers, with 70% of loans being made to Small and Medium Businesses. The program currently requires customers to also participate in a utility EE program. OBF could be offered as a High	Yes. Focused on buildings. Uses net metered energy consumption as the basis for savings. No incentive costs. Contains behavioral and operational elements

	Opportunity Program or Project as a standalone intervention strategy for customer investments. The projected meter based energy savings for the projects would be reported, which are also to calculate the customer's loan repayment. Energy savings would be based on pre/post measurement rather than rebate/incentive program participation. The process for an OBF project without a rebate or incentive would be faster, and less susceptible to interruptions than the current rebate or incentive process. This simplified intervention strategy could be offered quickly.	
Retro-commissioning (RCx)		Not as proposed here. Even though the proposal is focused on buildings and Retrocomissioning, persistence of savings for retrocommissioning is difficult to correctly capture with a calculated approach to savings
Market Sector	Commercial	
Measurement	Calculated	
Incentive structure	Based on verified savings	

Measure type	Single or multi-measure at customer discretion	measurement. We believe a modified approach based on meter-based savings measurement, and that includes a long-term maintenance agreement and training, could pass High Opportunity Programs or Projects muster
Intervention strategy	The existing RCx program identifies and improves less-than optimal energy performance in an existing building's equipment and control systems to save energy1/. In light of the baseline provisions within AB 802, the RCX program structure, can be modified and quickly mobilized in early Q1 2016 to deliver additional energy savings and reach more customers than are currently served.	
1/ **Inefficient Equipment Bounty Program**		Not as proposed here. "Cash-for clunkers"-type programs with deemed savings values are difficult to implement effectively, have historically not yielded promised savings and have even increased energy consumption.[18]
Market Sector	Commercial	
Measurement	Deemed or calculated	

[18] For a general discussion of the pitfalls of such programs, *see* Davis, Lucas W., Alan Fuchs, and Paul Gertler. 2014. "Cash for Coolers: Evaluating a Large-Scale Appliance Replacement Program in Mexico." *American Economic Journal: Economic Policy*, 6(4): 207-38. ("refrigerator replacement reduces electricity consumption by 8 percent, about one-quarter of what was predicted by ex ante analyses. Moreover, we find that air conditioning replacement actually increases electricity consumption. Overall, we find that the program is an expensive way to reduce externalities from energy use, reducing carbon dioxide emissions at a program cost of

Footnote continued on next page

Incentive structure **Measure type** **Intervention strategy**	Deemed or calculated plus "bounty" based on age of equipment Single or multi-measure at implementer and customer discretion The Inefficient Equipment Bounty Program would target the replacement of old equipment (e.g. T12 lighting, HVAC, and boilers) to identify and eliminate and the least efficient equipment in California to achieve large long term energy savings. The program would put in place a "bounty payment" for implementers, which could be based on the age of the equipment to seek out and replace old and inefficient equipment still in operation. This type of	We support the idea of a High Opportunity Program or Project targeting old boilers, but are concerned about both ex ante overestimations of savings and excessive free ridership. We suggest that a program built around meter-based savings measurement and a mix of up-front and performance-based incentive payments could pass High Opportunity Programs or Projects muster.

over $500 per ton.") *See also* D.15-10-028 (noting decline in savings associated with appliance recycling programs, even with an existing conditions baseline already in place).

	approach was successfully applied, from 2010 to 2012, in a multi-family (MF) boiler replacement program in San Francisco. 2/ The program results demonstrate that this approach can be used to encourage market actors to seek out and replace inefficient equipment that is kept in service long past its expected useful life.	

In sum, conceptually, all of PG&E's proposed programs except the industrial program either are or, with modifications, could be, High Opportunity Programs or Projects. While PAs' formal proposals may make material changes to these or similar programs such that we reconsider these assessments when we see detailed proposals, we are generally encouraged at the direction seen in these examples.

IT IS RULED that:

1. Beginning January 1, 2016, Program Administrators may submit High Opportunity Programs or Projects to the Commission for expedited review.
2. Program Administrators shall submit proposals for High Opportunity Programs to the Commission's Energy Division via Tier 1 Advice Letters.
3. Program Administrators shall submit proposals for High Opportunity Projects to the individual(s) within Energy Division currently designated to receive proposals for custom projects.

4. High Opportunity Programs or Projects proposals shall include information as set forth in the body and attachments to this ruling.

5. High Opportunity Programs or Projects proposals shall conform to the substantive guidance in this ruling.

6. Program Administrators seeking to establish new deemed savings values shall submit workpapers for such new values to the California Technical Forum prior to including the workpapers in a High Opportunity Programs or Projects proposal.

7. Commission Staff shall review High Opportunity Programs or Projects as set forth in the body of this ruling.

Dated December 30, 2015, at San Francisco, California.

/s/ CARLA J. PETERMAN	/s/ TODD O. EDMISTER
Carla J. Peterman	Todd O. Edmister
Assigned Commissioner	Administrative Law Judge

Attachment A: Proposed Definitions and Requirements for High Opportunity Projects and Programs

The Commission is clarifying the terms "normalized metered energy consumption" as key concepts for guidance on eligible High Opportunity Projects and Programs envisioned in AB 802 for the anticipated proposals submitted after January 1, 2016.

1. Interpretation of legislation language "normalized metered energy consumption"

Topic	Definition should include	Should not mean	PA Proposal Requirements
Normalized	1) Energy use is adjusted to account for external factors that may influence energy use trends, so that pre and post measurements reveal savings due to the program intervention. 2) Account for key drivers[19] that affect energy use, relevant to the targeted sector, including: a. weather (all sectors) b. production volume/activity level (non-residential) c. occupancy (all sectors)	1) A simple creation of a common denominator is not sufficient to normalize (i.e. kWh per square foot) as it does not allow for an accurate comparison of pre and post conditions. 2) Mathematical expressions or algorithms to normalize are not being prescribed by the Commission, but all calculations and methods must be made available for review.	1. Programs and projects must document the method for normalization and list: a. the variables included in the normalization process and b. documentation of specific program actions that were intended to drive savings. 2. Models, methods, and tools must use recognized

[19] The following external drivers have been identified in the International Performance Measurement and Verification Protocol (IPMVP), citation available in the reference section. Key drivers must also be considered in econometric or statistical models, not just engineering models.

Topic	Definition should include	Should not mean	PA Proposal Requirements
	d. or schedule (non-residential) e. non-routine adjustments (non-residential) f. And any other baseline adjustments based on the guidelines listed on the References section (all sectors)		engineering, economic or statistical approaches to normalization. 3. Models, methods and tools must be transparent, reviewable and replicable by peer reviewers.[20] 4. In addition to normalized savings as defined here, programs and projects shall also report absolute changes in consumption expressed with a common denominator.
Metered	1) Data is collected from a device designed to quantify electricity, natural gas usage over time or at specific times. a) Data from Advanced Metering Infrastructure (AMI) from an ANSI	1. Simulations, inferences and proxies without data representing the pre and post intervention period based on meter data are excluded 2. Projects or programs that shift load, substitute fuel, install on-	1. Models must include pre and post-intervention data streams. Minimum 1 year post data for retrofits, and minimum 3 years for Behavior Retrofit or Operations 2. Models, methods, tools must

[20] Proprietary models must be submitted to the CPUC for review, but they will not be made publicly available. Peer reviewers will be under contract with the CPUC and will sign non-disclosure agreements before reviewing proprietary tools.

Topic	Definition should include	Should not mean	PA Proposal Requirements
	approved meter is the most likely source of metered data b) [optional] Sub meter (for a group of buildings, a single building, or a portion of a building, if necessary to detect intervention) 2) Tied to a specific physical location where the intervention is taking place 3) Billing data is acceptable if it is based on actual metered not estimated consumption 4) May be aggregated effects at a building, a group of buildings, a program, a neighborhood or other combinations. For aggregated approaches, building level results will need to be discernable. 5) Deemed values, re-defined savings estimates from engineering estimates with updated baseline assumptions	site power generation, curtail operations, transfer operations, solely implement activities to comply with non-energy related regulations or otherwise do not meet the intent of the definition of energy efficiency shall not count as the basis of savings	be transparent, reviewable and repeatable 3. Meter does not necessarily equal whole building, so proposals must make clear the link between meter and building

Topic	Definition should include	Should not mean	PA Proposal Requirements
Energy Consumption	1. An energy efficiency intervention may result in a decrease or increase energy consumption. 2. Normalized and metered are conditions for measuring changes in consumption, which will be quantified, based on post intervention data. 3. Changes in consumption may be attributable to: 1. Behavioral, retro commissioning and operational interventions. 2. May be aggregated effects at a building, a group of buildings, a program, a neighborhood or other combinations. Site level results will need to be discernable for verification purposes.	Changes in energy consumption that have nothing to do with the program intervention: 1) Economic recession 2) Noncompliance with code (i.e. safety and operational) 3) Any other intervention that reduces consumption but has a substantial negative effect on service 4) Changes resulting from routine maintenance.	1. Proposals for programs or projects must document the market barriers they are designed to address and the interventions planned to achieve reductions in energy consumption

2. Programmatic Guidance:

Program /Project Parameters:	Permissible (under what conditions?)	Not permissible	PA Proposal Requirements
General Program Design			
Types of programs or projects	1. Whole building (residential or non-residential), multi-measure, deep retrofit projects/programs a) May also include full floor or wing of building if a comprehensive intervention is planned 2. Program proposals based on aggregated effects of a single measure or intervention for residential or non-residential buildings from a group of buildings, program, a neighborhood or other combination. 3. Single measure in an existing non-residential building that is	1. Projects or programs considered New Construction[21]: b) New building projects wherein no structure or site footprint presently exists. c) Addition or expansion of an existing building or site footprint. d) Addition of new load, as in the example of an existing site adding a new process. e) Construction that involves complete removal, redesign, and replacement of the energy consuming systems of a building or process. f) Projects that require design and	1. Description of the nature of the proposed program or project intervention with respect to whole building or single measures 2. Site level results will need to be discernable at building level for verification purposes.

[21] New Construction definition as per Savings by Design 2015 Program Manual: http://www.savingsbydesign.com/book/savings-design-online-program-handbook#booknode-437

Program /Project Parameters:	Permissible (under what conditions?)	Not permissible	PA Proposal Requirements
	detectable on the meter, such as changing a boiler or chiller or otherwise likely to have a large effect on the customers metered usage 4.	selection of new systems based upon the needs of new or modified space function(s). g) Major tenant improvements that add new load. 2. Programs or projects focused on a single measure for a single site that is an intervention designed to change a process.	
Threshold for expected savings	1. In order to encourage deeper savings, submissions of non-residential whole building projects should strive to meet a minimum savings threshold of a 10% reduction in building energy consumption, but it is not a requirement. 2. Other savings targets may be acceptable for whole building projects and proposals based on combinations of buildings, neighborhoods, populations pending review of program design and M&V plan.	Programs and projects with an M&V plan that cannot reliably demonstrate savings estimate precision at standard confidence intervals in order to limit ratepayer exposure to risks associated with savings measurement error and uncertainty.	1. Description of the expected saving from the proposed program or project intervention 2. Literature or field performance data demonstrating the expected impact and expected certainty of estimates.

Program /Project Parameters:	Permissible (under what conditions?)	Not permissible	PA Proposal Requirements
	3. All proposals must reliably demonstrate savings estimate precision and adhere to CPUC measurement protocols.		
Ex-post claims and evaluation	1. Energy savings achieved through these programs or projects will only be claimed to the Commission on an ex post basis (annual and lifecycle). a) After an intervention and b) 1 year of post measurement for retrofits & c) starting 1 year after a behavior, retro commissioning and operations intervention but trued up after 3rd year to demonstrate persistence d) life cycle savings will be forecast based on existing rules 2. CPUC-led ex post third party evaluation activities will e) Review and approve models,	Claims to the Commission will not be based on (*see section on metered)*: 1. Deemed values, pre-defined savings estimates from engineering estimates are excluded 2. Simulations, inferences and proxies without data representing the pre and post intervention period based on meter data are excluded	*See sections on Normalized, Metered, and Consumption for proposal requirements for ex post claims and evaluation.*

Program /Project Parameters:	Permissible (under what conditions?)	Not permissible	PA Proposal Requirements
	methods prior to program or project deployment. f) Review ex-post savings claims based on approved models g) Conduct additional evaluation activities as needed to verify savings or improve programs 3. PAs will submit savings estimates for the purposes of estimating program or project size or cost effectiveness for the customer or to the Commission, but these estimates will not be used to determine achievement of goals or incentive payments.		
Baseline Adjustments	1. Baseline based on meter data will allow for savings claims from existing conditions. 2. Baseline should follow the normalization guidelines described in section on *normalization section*.	Baseline adjustments are not necessary for eligible for repair measures, or early retirement	1. Documentation of the baseline assumptions and strategy for collecting necessary information 2. Description of how normalization methods capture (or not) baseline

Program /Project Parameters:	Permissible (under what conditions?)	Not permissible	PA Proposal Requirements
	3. For replace on burnout, follow existing rules for establishing baseline as per the Energy Efficiency Policy Manual (Version 5, July 2013, #6 p. 31)		assumptions
Application to Behavioral, Operational, Retro-commissioning (B.R.Os)	1. Interventions need to be feasible, cost effective and properly scaled to the potential value gained. 2. Programs or projects that are capturing effects from such changes must include: a) Continuous feedback for the building operator (or home owner) to sustain savings. b) Use of appropriate analytical methods by which potentially small changes in consumption can be attributed to operational effects, versus other effects c) Detailed documentation of the operational interventions.	Proposed programs or projects should not violate: 1. Energy Division approved rules concerning documentation of reasonable maintenance. 2. Energy division approved rules concerning expected customer responsibility for repairs and maintenance.	1) Program/project proposals shall: a) Include requirement that participant sign up for a maintenance plan for at least three years. b) Include requirement that participants commit to install a minimum set of measures according to PA pre-defined criteria. 2) PA is encouraged to include a training component to program/project offerings. a) 3) Performance post-intervention: a) Must ensure persistence of savings that ensures

Program /Project Parameters:	Permissible (under what conditions?)	Not permissible	PA Proposal Requirements
	d) A detailed data tracking plan. 2) Interventions create multiyear savings Claims for savings are made after demonstrated metered persistence (2years post data) 3) PAs shall submit annual first year claims for a minimum of 2 years, and can continue claiming savings as long as they can demonstrate persistence. 4) EUL for behavioral, retrocommissioning, and operational measures is 1 year.		multiyear savings for measures that are based in changes in behavior or operational practices. b) During the claimable expected useful life (EUL) period, continuous feedback should be in place. c) PAs shall consider incentive structures that encourage long term savings d) Incentives shall only be paid once participant commits to a maintenance plan for a minimum of three years (evidence should be made available to Commission staff upon request).

Program /Project Parameters:	Permissible (under what conditions?)	Not permissible	PA Proposal Requirements
Customer incentives	1. Customer payment must be at least in part be based on ex-post data from changes in normalized metered energy consumption 2. Pay for performance should allow for one year of baseline measurement and account for the length of time the savings are expected to persist. Hence, the incentive strategy should account for multi-year lifecycle savings. 3. Payment structure should mitigate the risk that potential up-front payments do not overrun the realized savings 4. Replace-on-burnout equipment replacement and standard building repair and maintenance needs to be accounted for, with incentives appropriate to reflect the customer activity in absence of	1. Incentive structure that is wholly based on savings estimates or use of deemed measures 2. Incentive structure that allows for more than 50% of adjusted total project cost without workpaper submission	1. Basis and rationale for payment structure--Explain the payment structure, including the basis for setting the upfront payment (if any) and how the structure mitigates the risk that potential upfront payments do not overrun the realized savings 2. Capital costs and access to capital—Identify the estimated capital costs and the sources of capital funding the project 3. Partial or incremental payments with true up over time—Describe the terms and schedule of the incentive payments 4.

Program /Project Parameters:	Permissible (under what conditions?)	Not permissible	PA Proposal Requirements
	the program intervention 5. Incentives for behavioral, retrocommissioning, and operational measures shall only be paid once participant commits to a maintenance plan for a minimum of three years (evidence should be made available to Commission staff upon request).		
Financing	Programs and projects proposed should consider how they can leverage: a) statewide financing pilots approved in D. 13-09-044 b) other existing utility and REN financing models or c) External financing sources to maximize the effects of these interventions at the lowest cost to ratepayers	Specific to the statewide finance pilots: per D.13-09-044, and D. 15-06-008 if a measure is not an eligible energy efficiency measure (EEEM), it is not eligible for credit enhanced financing.	1. Description of any use of financing programs or external financing to support the program or proposed project.
Efficiency Savings Performance	Savings from these proposed projects and programs will be classified as "uncertain"	ESPI claims for High Opportunity Programs or Projectsprograms filed in the ex ante savings phase of the	No requirement

Program /Project Parameters:	Permissible (under what conditions?)	Not permissible	PA Proposal Requirements
Incentive (ESPI)	1. Subject to CPUC-led ex post evaluation prior to being eligible for ESPI payment claims 2. Follow rules and procedures for high uncertainty measures (D. 13-09-023) 3. EUL for behavioral, retrocommissioning, and operational measures is 1 year.	proceeding.	

(End of Attachment A)

Attachment B: References

Source	Name/Citation	Relevance & Description	Link
STANDARDS, PROTOCOLS, AND GUIDELINES			
American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)	ASHRAE Guideline 14 (2014). Measurement of Energy, Demand, And Water Savings; ISSN 1049-894X.Guideline 14, (2002)	This document provides a standardized set of energy, demand, and water savings calculation procedures, as well as guidance on minimum acceptable levels of performance for determining savings, using measurements. In reference to our definition of normalized, bullet # 2, this guideline provides more technical detail on Option C change point models and examples. Description from the text: "Guideline 14 provides a standardized set of energy, demand, and water savings calculation procedures. This publication provides guidance on minimum acceptable levels of performance for determining energy and demand savings, using measurements, in commercial transactions."	Link to 2002 version: https://gaia.lbl.gov/people/ryin/public/Ashrae_guideline14-2002_Measurement%20of%20Energy%20and%20Demand%20Saving%20.pdf 2014 version for sale on www.ashrae.org

Source	Name/Citation	Relevance & Description	Link
Bonneville Power Administration	Regression for M&V: Reference Guide (May 2012)	It includes suggestions and practical applications. Description from the text: "provides a complement to the Measurement and Verification (M&V) protocols used by the Bonneville Power Administration (BPA). The Regression Reference Guide assists the engineer in conducting regression analysis to control for the effects of changing conditions (i.e., weather) on energy consumption."	https://www.bpa.gov/EE/Policy/IManual/Documents/July%20documents/3_BPA_MV_Regression_Reference_Guide_May2012_FINAL.pdf
	Existing Building Commissioning: An M&V Protocol Application Guide (2010)	This document provides an overview of the issues specific to the application of energy modelling to an EBCx process, reporting requirements for M&V and then gives examples of whole building M&V approach and system level verification.	https://www.bpa.gov/EE/Policy/IManual/Documents/July%20documents/8_BPA_MV_ECBx_Application_Guide_May2012_FINAL.pdf
California Commissioning Collaborative	California Commissioning Guide: Existing Buildings (2006)	This document provides an overview of retrocommissioning (RCx) projects concepts and definitions. This document served as a basis for establishing differences between RCx and regular maintenance. Relevant portions were cited in Attachment A.	http://www.documents.dgs.ca.gov/green/commissionguideexisting.pdf

Source	Name/Citation	Relevance & Description	Link
California Public Utilities Commission	Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals (2006)	Chapters on Impact Evaluation Protocol (p. 19) and Measurement and Verification Protocol (p. 49) Description from website: "Provides guidance to policy makers to plan and structure energy efficiency evaluation efforts."	http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/EM+and+V/ Listed under Reference Materials
California Public Utilities Commission	California Evaluation Framework (2004)	Description from website: "Provides a consistent, systemized and cyclic approach for planning and conducting evaluations of California's energy efficiency and resource acquisition programs."	http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/EM+and+V/
Federal Energy Management Program	M&V Guidelines (2008). Measurement and Verification for Federal Energy Projects Version 3.0	This document provides an overview of M&V, the methods for M&V, how to select an M&V method, develop an M&V plan, commissioning process and reporting requirements for M&V.	http://energy.gov/eere/femp/downloads/mv-guidelines-measurement-and-verification-federal-energy-projects-version-30
International Organization for Standards	ISO 50015: 2014 Energy Management Systems	International Standard with general definitions of M&V Description from website: "establishes general principles and guidelines for the process of measurement and verification of energy performance of an organization or its components. ISO 50015:2014 can be used independently, or in conjunction with other standards or protocols, and can be applied to all types of energy."	http://www.iso.org/iso/catalogue_detail?csnumber=60043

Source	Name/Citation	Relevance & Description	Link
	ISO 50006:2014 Energy Management Systems	General discussion of baseline issues for energy management systems Description from website: "provides guidance to organizations on how to establish, use and maintain energy performance indicators (EnPIs) and energy baselines (EnBs) as part of the process of measuring energy performance. The guidance in ISO 50006:2014 is applicable to any organization, regardless of its size, type, location or level of maturity in the field of energy management."	http://www.iso.org/iso/catalogue_detail?csnumber=51869
International Performance Measurement and Verification Protocol (IPMVP)	IPMVP Core Concepts 2014	Simplified language of IPMVP framework of M&V options (provides definition of normalized savings that probably is NOT what the legislature had in mind) Description of IPMVP from website: "The IPMVP provides an overview of current best practice techniques available for verifying results of energy efficiency, water efficiency, and renewable energy projects in commercial and industrial facilities."	www.evo-world.org
	IPMVP Concepts and Options 2012	More detailed explanations of Options and examples.	www.evo-world.org

Source	Name/Citation	Relevance & Description	Link
North American Energy Standards Boards	Nothing specified		https://www.naesb.org/
PAPERS AND REPORTS			
Lawrence Berkeley National Laboratory (LBNL) Applied Energy Paper and Report	Granderson, J., Price, P. N., Jump, D., Addy, N., & Sohn, M. D. (2015). Automated measurement and verification: Performance of public domain whole-building electric baseline models. Applied Energy, 144, 106-113.	The findings of this work can be used to (1) inform technology assessments for technologies that deliver operational and/or behavioral savings; and (2) determine the expected accuracy of statistical models used for automated measurement and verification (M&V) of energy savings.	http://dx.doi.org/10.1016/j.apenergy.2015.01.026

Source	Name/Citation	Relevance & Description	Link
	Granderson, J., Touzani, S., Custodio, C., Sohn, M., Fernandes, S., Jump, D. Assessment of Automated Measurement and Verification (M&V) Methods. Lawrence Berkeley National Laboratory report LBNL-187225; July 2015.	The results of this work show that interval data baseline models, and streamlining through automation hold great promise for scaling the adoption of whole-building measured savings calculations using Advanced Metering Infrastructure (AMI) data. These results can be used to build confidence in model robustness.	http://eetd.lbl.gov/node/60099
ASHRAE Paper on Inverse Modeling	Kissock, J., Haberl, J., Claridge, D., (2003). Inverse Modeling Toolkit: Numerical Algorithms. ASHRAE Transactions 01/2003; 109:425-434	"This paper describes the numerical algorithms used to find general least squares regression, variable-base degree-day, change-point and combination change-point multivatiable regression models in the Inverse Modeling Toolkit as well as the equations used for the purpose of measuring savings using IMT models."	http://www.eeperformance.org/uploads/8/6/5/0/8650231/ashrae_-_inverse_modeling_toolkit_-_numerical_algorithms.pdf
EXAMPLES OF IMPLEMENTATION			
	ECAM+	Excel implementation of ASHRAE Change point models.	http://www.northwrite.com/ecam.asp

Source	Name/Citation	Relevance & Description	Link
	Universal Translator 3 "The UT is software designed for the management and analysis of data from loggers and trend data from building management systems."	Example of the implementation of Change Point and Time/Temperature models. "Microsoft Excel-based tool that facilitates the examination of energy information from buildings, and ultimately reduces the time spent analyzing utility meter data and system operational data. Starting from simple time-series data, ECAM+ automates awide array of charting and analysis functionality."	http://utonline.org/cms/
Investor Confidence Project	**The Energy Performance Protocol for Large Commercial**	Includes project finance protocols and M&V links. "designed for large scale projects that involve whole building retrofits and other projects involving multiple measures with interactive effects where the cost of improvements and size of savings justifies greater time and effort in pre- and post-development energy analysis as well as high performing projects with sufficient savings for pre- and post-retrofit meter data yields where savings are of greater magnitude than noise."	http://www.eeperformance.org/large-commercial.html
IDEAS FOR PERFORMANCE BASED MODELS FROM THE CALIFORNIA SOLAR INITIATIVE			

Source	Name/Citation	Relevance & Description	Link
CPUC	D. 06-08-028	Opinion Adopting Performance-Based Incentives, an Administrative Structure, and Other Phase One Program Elements for the California Solar Initiative	http://www.cpuc.ca.gov/PUC/energy/Solar/About_the_California_Solar_Initiative.htm listed under "Selected Important Decisions and Rulings"
CPUC	D. 06-12-033	Opinion Modifying Decision 06-01-024 and Decision 06-08-028 In Response to Senate Bill 1. This decision modifies the Commission's earlier CSI decisions to phase in performance-based incentives more quickly	http://www.cpuc.ca.gov/PUC/energy/Solar/About_the_California_Solar_Initiative.htm listed under "Selected Important Decisions and Rulings"
CPUC	D. 07-07-028	Opinion Modifying Decision 06-08-028 Regarding Metering Accuracy and Monitoring Requirements This decision allows solar generation systems that receive EPBB incentives to install meters that are accurate within +/- 5%, and to require all systems that participate in PBI program to install meters that are accurate to within +/- 2% of actual system output and eliminate the cost cap.	http://docs.cpuc.ca.gov/DecisionsSearchForm.aspx

1) Examples of Standard Performance Contracting Impact Evaluations

All of the following studies are available at www.calmac.org using the search criteria "standard performance contract"

Sponsor	Title	Summary	Program Year
PG&E / CBEE	Interim Evaluation: California Board for Energy Efficiency PY98 Residential Standard Performance Contract Program	Early in the evaluation process for the PY98 program, it was suggested that immediate feedback on several critical areas of program design was desirable. As such, it was determined that a full and comprehensive evaluation, as initially planned for this program, would not meet the near-term needs of the CBEE. Given these time considerations, it was agreed that an interim report would be written to (1) summarize the history and current status of the program, (2) prioritize a disparate array of issues associated with the PY98 program, and (3) provide options and recommendations for the PY99 program.	1998
SCE / CBEE	Evaluation of the 1998 Nonresidential Standard Performance Contract Program: Volumes I and II	This evaluation study was commissioned by the California Board for Energy Efficiency (CBEE) and managed by Southern California Edison Company. The objectives of the evaluation, as stated in the original request for proposal, are to: 1.Conduct a statewide assessment of the baseline characteristics of the current nonresidential retrofit market for performance contracting and related energy-efficiency services. 2. Conduct a broad statewide process, market, and impact evaluation of the 1998 Nonresidential Standard Performance	1998

Sponsor	Title	Summary	Program Year
		Contract Programs, focused on: · reviewing and integrating utility tracking data, · characterizing how the Program actually worked in 1998, · refining hypotheses regarding the potential market effects of the Program, and · providing timely feedback for use in improving future NSPC Programs.	
PG&E	1999 State-Level Small/Medium Nonresidential MA&E [Market Assessment and Evaluation] Study	The study consists of 2 primary components: (1) an assessment of the baseline characteristics of the small nonresidential market; and (2) a broad process evaluation of the 1999 Small Business Standard Performance Contract (SBSPC) Program and the statewide 1999 Express Efficiency Program. The study used a variety of primary and secondary research approaches with most of the key results based on primary research conducted with a broad array of market actors active in small/medium nonresidential markets. A total of 403 California customers and 200 customers outside California were interviewed for this study. Neither program was found to penetrate a significant portion of the target market. Most program participants were satisfied with their program experiences. Includes recommendations for improving future programs.	1999
SCE	1999 Nonresidential Large SPC Evaluation Study	This report presents results from an ongoing, comprehensive evaluation of California's 1998 Nonresidential Standard Performance Contract Program (1998 NSPC) and 1999 Large	1998 1999

Sponsor	Title	Summary	Program Year
		Nonresidential Standard Performance Program (1999 LNSPC). Although the 1998 NSPC and 1999 LNSPC Programs include both resource-acquisition and market-transformation design intentions, this evaluation focuses more on the latter than on theformer. Includes general program evaluation, followup on the 1998 program, and baseline assessment. Method consists of interviews and assessment of utility program tracking data.	
SCE	Improving the Standard Performance Contracting Program: An Examination of the Historical Evidence and Directions for the Future	The primary objective of the study was to investigate why the SPC Program has such a relatively high rate of free-ridership, that is, a lower-than-expected net-to-gross ratio (NTGR). We looked at which customer and project characteristics seem to be associated with high or low free-ridership, and how program features or targeting could be changed to reduce the rate of free-ridership. As part of the investigation, we looked at the accuracy and stability of the NTGRs estimated for the 1998 and 1999 SPC Program, and checked whether particular survey questions seem to be driving the free-ridership result. We also looked at whether the self-report approach to estimating NTGRs for large nonresidential customers is systematically biased. Finally, we looked at the effect of the recent, dramatic increase in electricity prices on NTGRs and the total resource cost test. Recommendations for adjustments to the NTGR and program design are provided.	1998 1999 2000

Sponsor	Title	Summary	Program Year
SCE	2000 and 2001 Nonresidential Large SPC Evaluation Study	This is the third in a series of annual program evaluations of the statewide Standard Performance Contract program in California. This evaluation includes a broad statewide process and tracking data evaluation of the 2000 and 2001 LNSPC Programs focused on: 1. Interviewing customer and EESP participants for both years; 2. Characterizing how the Program worked; 3. Estimating self-report-based net-to-gross ratios for each year; and 4. Reviewing and integrating the results of utility tracking, monitoring and measurement activities.	2000 2001
SCE	EESP Program Opportunities: Large C/I Markets in California	The objective of this study was to identify program opportunities that might use public-goods charge funding to support the development of energy efficiency service providers (EESPs) within the large commercial and industrial (C/I) marketplace of electric consumers in California. The focus was on large engineering firms and facility management firms, which currently provide energy-related services to many buildings in California but have, to date, rarely participated in the Large C/I Standard Performance Contract programs offered by the utilities. To better understand these firms and their reasons for non-participation, this study researched energy service outsourcing and other types of services these firms typically	2000

Sponsor	Title	Summary	Program Year
		provide. The study also examined the current use of performance-based contracts for energy services as they are offered by California incentive programs, and as they are offered by these energy service firms to their clients. To better understand how the trends affect California's energy service firms, the research team interviewed decisionmakers at ten of the largest engineering firms and twelve of the largest property management/facilities management firms doing business in the state. The methods and results of the research are presented in this report, with recommendations concerning the role of the utility customer representative, a framework for program innovation, and improving communications with potential EESPs	
SCE	Nonresidential Standard Performance Contract (SPC) M&V Case Study Report	This report presents ten case studies of projects conducted by large nonresidential customers under California 1998 and 1999 nonresidential Standard Performance Contract (SPC) Program, with attention to the Measurement and Verification (M&V) component of these projects. The overall goal of these case studies was to bring a better understanding of the appropriateness and effects of the M&V required for the SPC Program. The case studies were projects implemented by customers with more than 500kW demand that had completed at least 1 year of M&V. The ten case studies outline the M&V process beginning from the project submittal and savings estimates through the first year (and, in some cases, second year) results. Where	1999

Sponsor	Title	Summary	Program Year
		possible, we interviewed the customer, the third-party firms sponsoring the project (if applicable), and utility representatives. The research questions focused on the participants knowledge, attitudes, and behaviors (both actual and hypothetical) concerning the M&V requirements.	
SCE	2002 Statewide Nonresidential Standard Performance Contract Program Measurement and Evaluation Study: Process Evaluation and Market Assessment Report	This report presents results from a set of evaluation activities focused on California's Nonresidential Standard Performance Contract Program for program year 2002 (PY2002). Although the PY2002 evaluation scope includes process, market, and impact evaluation components, this report covers only the process and market evaluation. (The impact evaluation report is in a separate volume.) The primary goal of this research is to provide feedback to program planners and policy makers to help improve the program, as necessary. This process evaluation and market assessment includes: (a) characterizing how the program actually worked; (b) reviewing and integrating the results of utility tracking, monitoring, and measurement activities; and (c) assessing energy-efficiency related market conditions.	2002
PG&E	2002 Statewide Nonresidential Cross-Program Evaluation	Study compared, contrasted and characterized three key nonresidential retrofit programs in California: Non-residential Audits, Express Efficiency and Standard Performance Contract (SPC). The report reveals how the programs are integrated, as well as highlighting the relative successes with different implementation strategies.	2002
SCE	2002 Statewide	This report present results from an impact evaluation	2002

Sponsor	Title	Summary	Program Year
	Nonresidential Standard Performance Contract Program Measurement and Evaluation Study: Impact Evaluation Report	conducted for California's Nonresidential Standard Performance Contract (SPC) Program for program year 2002 (PY2002). The overall PY2002 evaluation scope included process, market, and impact evaluation components. This report covers only the gross impact evaluation objective. Independent ex post impact evaluation had never been performed on the California SPC Program prior to this evaluation. In the first years of the Program, measurement of savings was conducted as part of the program participation process and was the basis for incentive payments. Since then, the amount of in-program measurement declined dramatically as the program switched to basing savings estimates and incentives on ex ante calculations. The primary goals of the evaluation are to develop a gross savings realization rate and to provide qualitative feedback on how to improve the SPC Program's resource performance in the future.	
SCE	2003 Statewide Nonresidential Standard Performance Contract (SPC) Program Measurement and Evaluation Study	California's Nonresidential Standard Performance Contract (SPC) program for 2003 offered cash incentives for completing energy-savings retrofits of existing equipment or systems to businesses and industrial customers. A primary objective for the PY2003 evaluation was to supplement the PY2002 evaluation effort by increasing the number of sites available for an impact evaluation. This report presents the combined impact-related results as well as the combined research findings for both program years. The PY2003	2003 2002

Sponsor	Title	Summary	Program Year
		evaluation focused on developing verification, ex post energy savings estimates, and free-ridership estimates for a sample of 25 sites. Also included: a summary of the PY2003 tracking data; the site-specific results for PY2003 impact evaluation sample; 25 detailed site-level impact evaluation reports; and a summary of customer and energy-efficiency service provider participant experiences with the PY2003 SPC program. The PY2003 results are combined with those of PY2002 to produce weighted gross savings realization rates and net-of-free-ridership estimates for the two program years.	
PG&E	Measurement and Evaluation Study of San Francisco Peak Energy Program (SFPEP) Program Year 2003-2004 Final Report	This report presents the findings and recommendations from the 2003-2004 San Francisco Peak Energy Program (SFPEP). This program was designed to achieve a 16MW gross peak load reduction during the summertime, daytime, peak, and similar reductions during the winter evening peak. The assessment of program impacts was focused on four main program elements that tracked energy savings (Cash Rebates for Business, Standard Performance Contracting, Single Family Direct Install, and Multi Family Rebates). To meet the objectives of the program, the evaluation results included reviewing participant data, determining appropriate samples for on-site data collection, reviewing savings calculation methods, and gathering and analyzing end-use data.	2003 2004

Sponsor	Title	Summary	Program Year
		This report presents the findings and recommendations from the 2003-2004 San Francisco Peak Energy Program (SFPEP). This program was designed to achieve a 16MW gross peak load reduction during the summertime, daytime, peak, and similar reductions during the winter evening peak. The assessment of program impacts was focused on four main program elements that tracked energy savings (Cash Rebates for Business, Standard Performance Contracting, Single Family Direct Install, and Multi Family Rebates). To meet the objectives of the program, the evaluation results included reviewing participant data, determining appropriate samples for on-site data collection, reviewing savings calculation methods, and gathering and analyzing end-use data.	
San Diego Regional Energy Office	Evaluation, Measurement and Verification of the 2004-2005 Local Government Energy Efficiency (LGEE) Program of the San Diego Regional Energy Office (SDREO) - CPUC Program #1301-04 – Final Report	This document represents the Final Report of the Evaluation, Measurement, and Verification (EM&V) activities of the 2004-2005 San Diego Local Government Energy Efficiency (LGEE) program, CPUC No. 1301-04, an energy efficiency local program provided for by CPUC Public Goods Charge Energy Efficiency Rulemaking R.01-08-028. LGEEP is a standard performance contract style incentive program targeting energy efficiency retrofit projects of local government facilities within San Diego County. The program is sponsored by the San Diego Regional Energy Partnership (SDREP) and administered and implemented by the San Diego Regional Energy Office (SDREO).	2004 2005

Sponsor	Title	Summary	Program Year
CPUC	2004-2005 Statewide Nonresidential Standard Performance Contract Program Measurement and Evaluation Study	This report presents results of an impact evaluation conducted for California's Nonresidential Standard Performance Contract (SPC) Program for program years 2004-2005. The overall PY2004-2005 evaluation scope included process, market, and impact evaluation components. Key Findings: the statewide 2004-2005 SPC Program estimates are as follows: 1. gross energy savings (kWh or Therms) realization rate is 0.79 2. gross demand savings (kW) realization rate is 0.73 3. net of free ridership ratio is 0.57	2004 2005
SCE	Process Evaluation of Southern California Edison's Business Incentives and Services Program: Program Years 2006 – 2008	This report presents findings of the process evaluation of Southern California Edison's (SCE's) Business Incentives and Services (BIS) Program for program years 2006 – 2008. This evaluation, conducted by Energy Market Innovations, Inc. (EMI), covers three BIS components targeted to SCE's nonresidential customers: Express Efficiency, Standard Performance Contracting (SPC), and the Nonresidential Audits (NRA). The 2006 – 2008 BIS Program was designed to integrate these three program components so that gaps and overlaps that existed under the previous "stand-alone" program approach	2006 2007 2008

Sponsor	Title	Summary	Program Year
		would be eliminated, thereby resulting in a more comprehensive and effective delivery of energy efficiency products and services to SCE's nonresidential customers. A key process evaluation objective was to determine the extent and effectiveness of this integration. Insight into the customer experience with the BIS program was drawn from a survey and in-depth interviews with program participants and in-depth interviews from customers that submitted applications that expired or were discontinued. The market perspective was characterized from in-depth interviews with vendors that sponsored incentive applications, supply chain market actors, and community-based organizations and trade associations. Lastly, the evaluation examined the internal organization and operational efficiency of program delivery via interviews with SCE program managers, account executives/account management staff, and third-party engineer reviewers. A large proportion of NRA customers were not aware of and did not participate in efficiency programs, indicating that the audit and incentive programs were not well integrated. This evaluation also revealed organizational and infrastructure weaknesses that have negatively affected some customers and their willingness or ability to participate in the program.	

Sponsor	Title	Summary	Program Year
		However, when the program "worked well," it provided customers with excellent service in a timely manner. Overall, program participants reported a very positive experience, evidenced by relatively high satisfaction ratings. Similarly, the BIS program also faired positively from the market perspective. That is, overall satisfaction with the program among contractors that sponsored project applications was strong, and industry trade allies are using SCE's programs as a marketing tool for their businesses. Consistent with the customer research results, the primary program weaknesses from the contractor perspective related to the application and inconsistent application processing time. The primary recommendations stemming from this research are to: 1.) Minimize lost savings opportunities by using audits as a resource for marketing the incentive programs, 2.) Establish a formal and systematic process for providing support to customers that "stall" in the program, 3.) Streamline and reduce the application review and processing time, 4.) Continue and expand efforts to develop partnerships and synergies with local governments, community-based organizations, and trade organizations, 5.) Review and document the program theory and logic, and 6.) Develop key performance metrics.	
CPUC	Major Commercial	Major Commercial is one of ten contract groups developed	2006

Sponsor	Title	Summary	Program Year
	Contract Group Volume 1 Final Impact Evaluation Report 2006-2008 Program Years	by the CPUC Energy Division (ED) to organize and manage the impact evaluation of California IOU programs in the 2006-2008 energy efficiency programs. It included an analysis of high impact measures (Custom Lighting, Custom HVAC, Custom Other and Audit) within the following five commercial, industrial and agricultural programs that were implemented by Southern California Edison (SCE), Southern California Gas (SCG) and San Diego Gas and Electric (SDGE).  SCE2517 – The Standard Performance Contract and non-residential audit portions of the SCE Business Incentives and Services Program (commercial/industrial retrofit)  SCE3513 – The SCG Business Energy Efficiency Program (commercial/industrial retrofit)  SDGE3025 - The SDG&E Standard Performance Contract Program (commercial/industrial retrofit)  SDGE3010 – The SDG&E Energy Savings Bid Program (commercial/industrial retrofit)  SCG3503 – The SCG Education and Training Program (non-residential audit)	2007 2008

Sponsor	Title	Summary	Program Year
		This impact evaluation consisted of three EM&V activities. The first activity was a verification analysis that was performed in two parts; for the first two program years 2006/07 and for all three program years 2006-2008. It was performed on four of the five Major Commercial programs. The other two EM&V activities are relevant to the full impact analysis of high impact measures for program years 2006-2008. The second activity was an analysis of gross savings achieved by high impact measures within the five non-residential retrofit programs included in the Major Commercial contract group. The third activity was an analysis of net savings achieved by high impact measures within these programs. This report documents the methods used and results obtained for activities two and three. The methods and results for the first activity were documented in a previous report.	

(End of Attachment B)

Attachment C: List of Custom/Retrocommissioning Programs

Utility	Program	Key Rule	Comment	Source link
Energize Connecticut	O&M	"This program is not intended for normal preventive maintenance and repetitive procedures or to subsidize major equipment purchases."	O&M of adjustment nature is allowed. Its retrofit program requires an RUL of 25% of equipment EUL.	http://www.energizect.com/businesses/programs/Operations-and-Maintenance (Who is eligible tab)
Pepco	Custom Programs	All measures combined must save a minimum of 25,000 kWh/year of electric energy. Ineligible measures are: 1) those included in another Existing Buildings program offering, 2) demand reduction measures unless they clearly and verifiably provide	O&M is ineligible in custom measures but allowed in RCx. Incentive paid only on measures that produce savings	https://cienergyefficiency.pepco.com/Custom.aspx (custom incentive application link)

Utility	Program	Key Rule	Comment	Source link
		energy savings as well, 3) operations and maintenance measures/procedures and 4) measures implemented for code requirement purposes. Eligible measures must provide energy savings beyond criteria established by State and local codes, as applicable.		
Wisconsin Public Service	Compressed Air Leak Repair	A three-year service program that mandates annual surveys and repairs of compressed air leaks	Annual incentives based on verification	https://focusonenergy.com/sites/default/files/Application_PDFs/TM_compAirleakRepair_121614.pdf
Illinois EE	Custom Program	Projects that repair or replace existing equipment with like equipment.	RCX is not separately listed. See clause 2.4	http://www.illinois.gov/dceo/whyillinois/KeyIndustries/Energy/Documents/2015-2016%20Public%20Sector%20Standard%20and%20Custom%20Incentive

Utility	Program	Key Rule	Comment	Source link
				%2011182015.pdf
Massachusetts and New York	Custom Programs	**12. Maintenance of EEMs** Customer acknowledges and agrees that Customer shall operate and maintain the EEMs in accordance with the manufacturer's recommendations and the terms hereof, and shall replace consumable parts and other components with comparable or superior efficient products at the Customer's expense.	RCx not listed separately. See clause 12.	http://www.masssave.com/business/incentives/Custom-Measures-Retrofit?p=e8eaa759-1436-43a2-8c4c-5f5011049788 (link to application Form)
Xcel Energy (Colorado)	RCx	The main purpose of commissioning your existing building is to improve and optimize how your systems operate.	Woks from a list of approved measures http://www.xcelenergy.com/staticfiles/xe/Marketing/Managed%20Documents/Recommissioning-MN-CO-Addendum-A.xls	http://www.xcelenergy.com/Energy_Solutions/Business_Solutions/Energy_Efficiency_Studies/Recommissioning

Utility	Program	Key Rule	Comment	Source link
		It is not a method for keeping old, inefficient equipment running.		

(End of Attachment C)