TOD/ek4 11/4/2015

FILED
11-04-15
11:24 AM

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

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

ADMINISTRATIVE LAW JUDGE'S RULING REQUESTING COMMENTS ON COMMISSION STAFF WHITE PAPER REGARDING "HIGH OPPORTUNITY PROGRAMS OR PROJECTS"

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 Rulemaking 13-11-005)" set out the procedural schedule for the current phases of this proceeding. Pursuant to that schedule, Commission Staff have prepared a white paper regarding "high opportunity programs or projects" (high opportunities white paper). The high opportunities white paper is attached as Exhibit A.

IT IS RULED that:

1. Parties may file comments on the high opportunities white paper by no later than November 20, 2015.

2. Comments should follow the outline structure of the high opportunities white paper.

3. We are not imposing any page limits on comments.

Dated November 4, 2015, at San Francisco, California.

/s/ TODD O. EDMISTER
Todd O. Edmister
Administrative Law Judge

Exhibit A

Proposed Framework for AB 802 High Opportunities Projects and Programs

Proposed Framework for AB 802 High Opportunities Projects and Programs

Objective: In this white paper, Commission staff identifies the provisions of PU Code Section 381.2 that need to be interpreted in order to enable the January 1, 2016 effective date for "high opportunity projects and programs" (HOPPs) and proposes an approach for HOPPs implementation.

Introduction

Summary of PU Code Section 381.2(b),(c):

- The commission shall authorize IOUs to provide incentives "*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."*
- By January 1, 2016, "*The commission shall provide expedited authorization of high opportunity projects and programs to apply the savings baseline provisions"* from the above section.

Key Issues for Implementation of HOPPs by Jan 1, 2016:

1. Propose a definition for "high opportunity projects and programs" (HOPPS) and determine their qualifications.
2. Identify filing requirements for HOPPS and how HOPPS should be integrated into the integrated into the portfolio.
3. Determine the requirements for expedited authorization of HOPPS and procedures for review.
4. Set guidelines for quantifying energy savings as "*normalized metered energy consumption"* and requirements for reporting and verifying savings.
5. Provide guidance for customer and administrator performance incentive payments.

Proposal for Implementation

A. Definition of HOPPs:

Staff recommends that HOPPs be defined broadly, with some exceptions as detailed in Attachment A, to allow Program Administrators (PAs) and implementers to propose a variety of programs and projects that can qualify as high opportunity, and that the Commission more specifically define the normalized metered energy consumption criteria for *ex post* savings claims. Thus all interventions, including behavioral, retrocommissioning, and operations as well as traditional capital investment programs may qualify under the following conditions:

- The program or project uses *ex post* data based on normalized metered energy consumption as the basis for savings claims.
- If the program or project provides a customer incentive payment, the payment reflects the performance of the program or project intervention.
- A measurement and verification (M&V) plan is incorporated into the program or project design.
- The program or project meets the submission requirements and M&V protocols proposed in this white paper and to be finalized in a subsequent Commission ruling.[1]

B. Portfolio Framework Considerations for HOPPS

Staff recommends that the general portfolio framework not be changed to accommodate the HOPPs projects. These framework changes would require a greater breadth of issues to be considered in a Commission decision, which would not allow us to meet the January 2016 statutory deadline.

1. **Budget:** Total portfolio budget will not be adjusted, though PAs may shift funds as needed, up to 10% of the total portfolio budget.
2. **Goals:** Goals will not be adjusted, since there is no basis to estimate savings forecasts for HOPPs; HOPPs program or project savings can be applied toward current goals.
3. **Cost-Effectiveness:** Cost effectiveness methodology applies. Staff points out that *Standard Practice Manual defines the measure cost for an existing condition baseline to be the full measure cost*.
4. **Savings Claims:** Savings will be claimed on an *ex post* basis.
5. **Evaluation, Measurement and Verification (EM&V) Process:** While "AB 802 programs and projects" will include their own measurement and verification, the Commission will conduct an independent EM&V process in order to verify the effectiveness of the different models implemented as HOPPs. Commission-led *ex post* third party evaluation activities will focus on

[1] The process for establishing the protocols and review will be informed by comments on the ruling.

reviewing models, methods, and results, and may include field verification as needed.

6. **Energy Savings and Performance Incentive (ESPI) Payments:** Energy savings claimed through AB 802 projects and programs 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.

C. General Project/Program Design Requirements:

The intention of staff's proposed framework is to leave the program or project design open-ended in order to learn how the utility and/or energy efficiency industry would propose to implement projects on a consumption reduction model. These requirements will enable the Commission to gather sufficient information about the proposed projects and programs from the outset to understand each implementer's approach as a foundation from which to assess how the approach performed, and to inform the broader adoption of an existing baseline framework by September 2016.

1. **Definitions of Project and Program:** For the purpose of filing requirements and review process, project and programs are defined as the following:
   - A *project* is implemented for or by a single customer/facilities owner, which may involve more than one building, but specific buildings and interventions have been established at the time of the proposal and specific savings estimates may be provided.
   - 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 HOPPs proposal should be more developed in its integration of the program strategy with its measurement and verification plan.
2. **Qualifying Measure/Whole Building Treatment:** Staff proposes that the Commission not be prescriptive about what measures qualify or are excluded from HOPPs. However, we are proposing to treat HOPPs as a learning experience, upon which to base the future requirements; so Program Administrators and implementers should consider the value added of projects receiving *ex post* savings treatment. Staff proposes that preference should be given to whole building, multi-measure, deep retrofit approaches that may result in large savings. In addition program proposals could include

interventions for large groups of participants where savings are determined *ex post* at the program level. Proposals should not include projects or programs considered "New Construction" as per the definition included in the Savings by Design Program Manual[2] or programs or projects focused on a single measure for a single site. Savings from burned-out equipment that will be replaced at the Title 20 or Federal standards regardless of program intervention still needs to account for the savings baseline relative to what would happen in absence of the program intervention.

3. **Threshold for expected savings:** Given the emerging measurement paradigm, ratepayers may face substantial adverse risks of programs and projects producing savings that are not detectible and verifiable. In order to minimize this risk and support the development of a robust M&V model, programs and projects will be subject to minimum thresholds for expected savings that encourage deep savings and are appropriate to the measurement error for a given program or project design. For example, a light bulb replacement will not likely be detectable on a billing regression analysis. Staff does not want to set inflexible requirements that may exclude productive proposals. However, we are concerned that standard statistical confidence intervals (e.g. 90% confidence) around savings point estimates may include negative savings values for some projects. Thus, HOPPs proposals should address risk management and proposed ranges for confidence intervals that are sufficient for making verified savings claims.
4. **Customer incentive design:** In order to encourage innovation in program design, HOPPs programs and projects may propose their own approach to incentive structure, which may include not providing any customer incentive, such as the current residential behavior programs; or may use project financing, Standard Performance Contracting, or other Energy Service Company (ESCO) models. However, the Commission expects that the payment strategy will be based in whole or in part on post-intervention "metered" savings models that reflect an accurate valuation of the savings:

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

- Customer payment must be at least in part based on *ex post* data from changes in normalized metered energy consumption.
- 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.
- Payment structure should mitigate the risk that potential up-front payments do not overrun the realized savings.
- Replace on Burnout (ROB) equipment replacement and 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.

5. ***Ex post* claims and evaluation:** Energy savings achieved through these programs or projects will only be claimed by utilities on an *ex post* basis. Given that the results of the programs and projects 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. A minimum period of 1 year of post-intervention measurement allows for capture of seasonal variation in energy consumption (and a minimum of three years for interventions that include behavior, retrocommissioning, or operational interventions).

   The lifecycle savings for an intervention is required 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.

   For behavioral, retrocommissioning or operational interventions the longevity of the savings must be reasonably expected to have multi-year impacts. The forecast longevity of the impact should be grounded in evidence from past studies or data collected from the field. Staff also recommends that expected useful life of these measures be tied to the duration the program administrator will measure these savings, and that the M&V period should be a minimum of three years. Energy savings claims to the Commission will only be permitted for behavior, retrocommissioning or operational interventions three years after the start of the intervention to assure reasonable persistence.

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.

6. **Treatment of Behavioral, Retrocommissioning, and Operational**: Proposals for programs or projects that are capturing savings from these interventions should demonstrate how to ensure persistence of savings and that interventions will result in multiyear savings.

   Staff is concerned about the grey area between what constitutes "regular maintenance and operation" of a building and "behavior, retrocommissioning and operational" measures. While savings from improved regular maintenance and operation may be visible using normalized meter data, it is important to emphasize the responsibility of participants in ensuring adequate maintenance and operation. Staff recommends that incentives only be paid after necessary repairs are made to bring buildings and equipment to reasonable operating practices , and that those adjustments be made to the pre-intervention measurement. For example, those implementing retrocommissioning interventions already do adjust their savings estimates to back out effects of routine maintenance.[3] Program administrators should consider Staff-adopted rules for behavior, retrocommissioning and operational interventions in the current custom review process. Staff recognizes that there is no Commission adopted definition of behavior programs for the non-residential sector. Parties are invited to propose definitions in comments; and proposals will be considered as rules are further developed.

D. Normalized Metered Energy Consumption and Reporting Guidelines:

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." Staff recommends

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

parameters for "taking into consideration the overall reduction in normalized metered energy consumption as a measure of energy savings" in the tables in Attachment A.

Staff's objectives in defining the phrase "normalized metered energy consumption" are to:

- Communicate expectations for consistent technical interpretation of these terms to allow for comparability of results and repeatability of methods for transparency in the market and regulatory process.
- Provide resources and references for these recommendations to improve understanding around the current methods and best practices.
- Clarify expected use of these terms to ensure reasonable, feasible and cost effective proposals emerge in the first round.
- Revisit these guidelines based on lessons learned from the HOPPs, 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 the definition, detailed considerations and reference materials to be used in the development of and documentation for projects presented to the Commission for approval. All questions must be addressed in the proposals submitted to the Commission.

E. Project Filing Requirements

Starting on January 1, 2016, PAs may submit proposals for programs or projects with the following documentation, as specified in Attachment A. This list of filing requirements is applicable to either an individual project or a program and will generally supplement to the basic submission requirements for new program or acustom project applications. The Commission will review comments on HOPPs filing requirements and finalize the specific details in the ruling issued in December.

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, i.e. Standard Performance Contracting, ESCO models, retrocommissioning, experimental design, financing, etc. 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.

b. Adjustments to baseline—Describe what baseline adjustments will be made for replace on burnout measures or expected maintenance and repair.

3. Saving Calculations Method

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

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 realized savings.

b. Capital costs and access to capital—Identify the estimated capital costs and the sources of capital funding anticipated for the project or program.

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 utilizing ongoing feedback.

F. Procedures for Review

The projects will be prioritized for an expedited *ex ante* review, using the existing procedures for programs and projects. All existing projects or programs (specifically demonstrations or pilots currently underway) will adhere to the rules and framework under which they were submitted, and should not be resubmitted as HOPPs. However, the review process will be altered to reflect the purpose of the HOPPs projects. Review of the *ex ante* savings estimate methodology will be deprioritized, while staff will review projects as a consideration of how to

implement and streamline the process for normalized metered energy consumption. Review period will be limited to 60 days of staff custody.[4]

1. **Programs:** To follow standard Tier 2 Advice Letter procedure.
2. **Projects:** Individual projects should be submitted as custom projects, according to Custom Review guidance provided in D.11-07-030 Attachment B, and including the information detailed in Attachment A. Custom review process will be modified to meet the specific objectives of AB 802, and the proceeding schedule, as further defined in the following ruling.

[4] Staff custody accounts for time that the proposal is under staff review; not time that staff has requested additional data and is waiting for a response.

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[5] affecting energy use, including: a) weather b) production volume/activity level c) occupancy or schedule d) non-routine adjustments e) And any other baseline adjustments based on the guidelines listed on the References section	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 engineering, economic or statistical approaches to normalization. 3) Models, methods and tools must be transparent, reviewable and replicable by peer reviewers. 4) In addition to normalized savings as defined here, programs and projects shall also report absolute changes in consumption expressed with a common denominator.

[5] 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
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 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.	1) The Commission is not interpreting "metered" to include sub-metered (non-whole building) projects or equipment level on-board metering at this time as a means of limiting and simplifying the number of potential projects and programs for review in January. 2) Deemed values, pre-defined savings estimates from engineering estimates are excluded 3) Simulations, inferences and proxies without data representing the pre and post intervention period based on meter data are excluded 4) Projects or programs that shift load, substitute fuel, install on-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	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 be transparent, reviewable and repeatable 3) Meter does not necessarily equal whole building, so proposals must make clear the link between meter and building
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: a) Behavioral, retro commissioning and operational interventions. b) May be aggregated effects at a	Changes in energy consumption that have nothing to do with the program intervention: a) Economic recession b) Noncompliance with code (i.e. safety and operational) c) Any other intervention that reduces consumption but has a substantial negative effect on service d) 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

Topic	Definition should include	Should not mean	PA Proposal Requirements
	building, a group of buildings, a program, a neighborhood or other combinations. Site level results will need to be discernable for verification purposes.		

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 at group of buildings, program, a neighborhood or other combinations.	1) Projects or programs considered New Construction[6]: a) New building projects wherein no structure or site footprint presently exists. b) Addition or expansion of an existing building or site footprint. c) Addition of new load, as in the example of an existing site adding a new process. d) Construction that involves complete removal, redesign, and replacement of the energy consuming systems of a building or process.	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.

[6] 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
		e) Projects that require design and selection of new systems based upon the needs of new or modified space function(s). f) Major tenant improvements that add new load. 2) Gut rehab of an existing building 3) Programs or projects focused on a single measure for a single site.	
Threshold for expected savings	1) In order to encourage deeper savings, submissions of non-residential whole building projects should generally meet a minimum savings threshold of a 10% reduction in building energy consumption. 2) Other savings targets may be acceptable for proposals based on combinations of buildings, neighborhoods, populations pending review of program design and M&V plan. 3) All projects and programs are expected to meet minimum thresholds for the precision and reliability of savings estimates, including adhering to CPUC measurement protocols.	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.
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 &	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	*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
	c) 3 years for behavior, retro commissioning and operations d) life cycle savings will be forecast based on existing rules 2) CPUC-led ex post third party evaluation activities will a) Review and approve models, methods prior to program or project deployment. b) Review ex-post savings claims based on approved models c) 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.	intervention period based on meter data are excluded	
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*. 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) 4) Baseline should be adjusted for routine maintenance and like for like	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 assumptions

Program /Project Parameters:	Permissible (under what conditions?)	Not permissible	PA Proposal Requirements
	replacement (e.g. replacing something with the exact same efficiency and type).		
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. d) A detailed data tracking plan.	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) Baselines should reflect adequate maintenance and operation.[7] a) Before proceeding with the projects, PAs should work with the participant to identify reasonable operating practices. b) PAs should document normal expected maintenance and operation. c) Any repairs necessary to bring the building to reasonable operating practices should be paid by the participant and prior to initiating incented work.[8]

[7] 'A maintenance tune-up is a systematic process performed either by in-house staff or an outside maintenance service provider, which includes a conditions assessment and the implementation of maintenance measures that have not been completed during the regular preventive maintenance schedule. This is often done prior to putting an ongoing preventive maintenance program in place or as the initial step in providing an ongoing maintenance service contract. Tune-ups tend to focus on maintenance of components and equipment, and address their physical condition.' (California Retrocommissioning Guide: Existing Buildings p.6, available at http://www.documents.dgs.ca.gov/green/commissionguideexisting.pdf)

[8] 'Special care should be taken to make sure that in-house staff or an outside maintenance service contractor completes scheduled preventive maintenance work before retrocommissioning begins. For example, if retrocommissioning occurs during the cooling season, the annual maintenance tasks for the cooling plant and systems should be completed before commencing with the project. It is not cost-effective to hold up the

Footnote continued on next page

Program /Project Parameters:	Permissible (under what conditions?)	Not permissible	PA Proposal Requirements
	3) Interventions create multiyear savings Claims for savings are made after demonstrated metered persistence (3 years post data)		2) Performance post-intervention: a) Must ensure persistence of savings (e.g. agree with participant long term maintenance and building operation plan) that ensures multiyear savings for measures that are based in changes in behavior or operational practices.[9] 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
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	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	5) 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

retrocommissioning process because of dirty filters, loose belts, broken dampers, or loose electrical connections. (California Retrocommissioning Guide: Existing Buildings pp.16-17 , available at http://www.documents.dgs.ca.gov/green/commissionguideexisting.pdf)

[9] For instance: energy management or performance long term plans.

Program /Project Parameters:	Permissible (under what conditions?)	Not permissible	PA Proposal Requirements
	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 (ROB) equipment replacement and standard building repair and maintenance needs to be accounted for, with savings adjustments to reflect the customer activity in absence of the program intervention		the realized savings 6) Capital costs and access to capital—Identify the estimated capital costs and the sources of capital funding the project 7) Partial or incremental payments with true up over time—Describe the terms and schedule of the incentive payments 8) Strategy for tracking persistence—describe the long term tracking and reporting strategy for sustained savings utilizing ongoing feedback.
Financing	1) 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 Incentive (ESPI)	1) Savings from these proposed projects and programs will be classified as "uncertain" a) Subject to CPUC-led ex post evaluation prior to being eligible for ESPI payment claims b) Follow rules and procedures for high uncertainty measures (D. 13-09-023)	ESPI claims in the ex ante phase of the proceeding.	No requirement

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
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 (M&V) 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
	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

Source	Name/Citation	Relevance & Description	Link
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
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
	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

Source	Name/Citation	Relevance & Description	Link
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
	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			
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"

Source	Name/Citation	Relevance & Description	Link
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

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.	1998

Sponsor	Title	Summary	Program Year
		2. Conduct a broad statewide process, market, and impact evaluation of the 1998 Nonresidential Standard Performance 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 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.	1998 1999
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	1998 1999 2000

Sponsor	Title	Summary	Program Year
		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.	
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 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	2000

Sponsor	Title	Summary	Program Year
		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 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.	1999
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 Nonresidential Standard Performance Contract Program Measurement and Evaluation Study: Impact Evaluation	This report present results from an impact evaluation 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	2002

Sponsor	Title	Summary	Program Year
	Report	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 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.	2003 2002
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
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,	2006 2007 2008

Sponsor	Title	Summary	Program Year
		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 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. 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.	

Sponsor	Title	Summary	Program Year
		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 Contract Group Volume 1 Final Impact Evaluation Report 2006-2008 Program Years	Major Commercial is one of ten contract groups developed 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) 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	2006 2007 2008

Sponsor	Title	Summary	Program Year
		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 Exhibit A)