

DRAFT

Rulebook for Custom Program and Projects Based on Normalized Metered Energy Consumption (NMEC)

Version 1.0

Release Date: 23-March-2018

Applicable to programs and/or projects proposed after adoption of CPUC adopted Business Plans.

Contents

1. Introduction	3
2. DEFINITIONS	4
Avoided Energy Use	4
Baseline Period	4
Behavioral	4
Embedded M&V	4
Evaluation, Measurement and Verification (EM&V)	4
Implementation Period	5
Maintenance	5
Measurement and Verification (M&V)	5
Non-Routine Adjustments	5
Non-Routine Events	5
Normalized Energy Savings	6
Normalized Metered Energy Consumption (NMEC)	6
Normal Operating Conditions	6
Operational	6
Program Influence	6
Repairs	6
Reporting Period (also referred to as Post-Implementation Performance Monitoring or Performance Period)	7
Retrocommissioning	7
Routine Adjustments	7
Strategic Energy Management (SEM)	7
3. Program Level Requirements	8
A. Custom Program and Projects Classification	8
B. Implementation Plans	9
C. Permissible Project Types	9
D. Expected Impacts as a Fraction of Total Billing	10
E. Incentives	10
F. Qualifying Measures	11
G. Cost Effectiveness and Measure Cost	12
4. Project Level Requirements	12
A. NMEC Project Stages and General Description	12
B. Project Baseline Adjustment	13
C. Project Savings Estimates	13
D. Project Savings Claims	14
E. Changing savings calculation methods	15
F. Tools, Methods, Analytical Approaches and Modeling software	15
G. Submetering	15
H. Energy Efficiency Savings Performance Incentive (ESPI)	16

1. Introduction

The purpose of the Custom Program and Projects Based on Normalized Metered Energy Consumption (NMEC) Policy Manual is to provide the most up to date list of the rules established by Commission Decisions and Resolutions that govern the administration of such programs.

The rules, terms and definitions contained herein pertain to efficiency activities funded through the following mechanisms:

- The gas public purpose program (PPP) surcharges, as authorized by §890-900.
- Electric procurement rates, as authorized by the Commission.

The rules in this policy manual, unless specifically indicated, apply to all the following entities: the investor-owned utilities (IOUs), Community Choice Aggregators (CCA), and Regional Energy Networks (RENS) and third-party implementers as per D.16-08-019 modified by D.18-01-004 that are funded through the mechanisms above.

While this manual does not include all Commission directives that are specific to the current portfolio cycle, Commission directives that are not included in this manual still apply.

This guidance refers to other sections of the CPUC Rolling Portfolio Guidelines Website. Please note that some of these sections may still be under development.

2. DEFINITIONS

Avoided Energy Use¹

Avoided Energy Use is the amount of energy (or peak demand) that was not consumed or realized as a result of the energy efficiency project or program intervention. Avoided energy use is the difference between actual energy consumption in the “reporting period” and the consumption that is forecast for the same period using the “baseline energy consumption model,” and where the baseline energy consumption model use is adjusted to reflect reporting period conditions. The Avoided Energy Use approach is used as the basis of customer incentive calculations and embedded M&V reporting of savings.

Baseline Period

The baseline period is the 12-month period leading up to the energy efficiency intervention or retrofit.

Behavioral

Behavioral activities provide energy savings from interventions that result in changes in actions by customers with respect to energy usage in a building. Behavioral activities consist of actions such as manually turning off lights and equipment, adjusting blinds, reducing water use and so on.

Embedded M&V

Refers to the collection of sufficient data to validate the savings claims and document the financial incentives. Implementers must submit an Implementation plan consistent with D.15-10-025 Appendix 4 and include a program level measurement and verification (M&V) plan that defines the data collection activities. Financial data shall include the amount of financial incentives paid to customers or the amount of compensation offered to implementers or contractors.

Evaluation, Measurement and Verification (EM&V)

EM&V consists of activities that evaluate, monitor, measure and verify performance or other aspects of energy efficiency programs or their market environment. Energy Division has management and contracting responsibilities for all EM&V impact-related studies that will be used to 1) measure and verify energy and peak load savings; 2) generate data for savings estimates, cost-effectiveness inputs, and the Commission’s adopted performance basis; and 3) evaluate whether portfolio goals are met.²

¹ Referred to as “Forecast Normalization” in the SEM Guidelines.

² California Public Utilities Commission, Energy Efficiency Policy Manual, v. 5 (July 2013).

Implementation Period

The Implementation period³ is the period between the baseline period and the reporting period. This period covers the time when the measures are installed and the project construction is completed. The implementation period may also include time to adjust, fine-tune, or commission the measure as part of the construction process.

Maintenance

Requires a minimum of tools and financial expenditures to adjust equipment components and restore expendable materials (such as fluids and filters) to their agreed-upon condition. Typical examples of such tasks include cleaning, adjusting, tightening, calibration, and lubrication.⁴ Maintenance should follow manufacturer recommended regularly scheduled work necessary to keep the equipment in optimal working condition, and instructing customers on how to carry out maintenance tasks should be a component of this intervention.

Measurement and Verification (M&V)

The process of using measurement to reliably determine actual savings created within an individual facility by an energy efficiency intervention. Savings cannot be directly measured, since they represent the absence of energy use. Instead, savings are determined by comparing measured use before and after implementation of a project, making appropriate adjustments for changes in conditions⁵.

Non-Routine Adjustments

Non-routine adjustments are used to account for the effects of non-routine events, where the changes affected by the NRE are not suitable to the baseline or reporting period adjustment models. Non-routine adjustments occur separately from the routine adjustments made using independent variables in the adjustment model. Non-routine adjustments are developed using methods including but not limited to engineering analysis, sub-metering, or other analyses using the metered energy use data.

Methods for identification and tracking of non-routine events and non-routine adjustments must be well substantiated and fully documented in the site M&V report.

Non-Routine Events

A non-routine event (NRE) is an externally-driven (i.e. not related to the energy efficiency intervention) significant change affecting energy use in the baseline or the reporting period and therefore must be accounted for in savings estimations. Typical NREs include changes in facility size, changes in facility activity not affected by the energy efficiency measures (such as addition or removal of a data center) or other modifications to the facility or its operation that alter energy consumption patterns and are unrelated to the program intervention.

³ Sometimes this is also referred to as the “installation” or “construction” period.

⁴ Edited from proposed revision to ASHRAE Standard 180.

⁵ International Measurement and Verification Protocol (IPMVP) Volume 1: Concepts and Options for Determining Energy and Water Savings. Efficiency Valuation Organization, 2010. Available at www.evo-world.org.

Normalized Energy Savings⁶

Normalized energy savings is the reduction in energy consumption or demand that occurs in the reporting period, relative to the baseline period, after both have been adjusted to a common set of normal operating conditions. Normalized Savings are used for the final reporting of energy and demand savings claims that are filed with the CPUC.

Normalized Metered Energy Consumption (NMEC)

NMEC is a method used to measure gross energy savings using metered energy consumption data to compare baseline and reporting period consumption under normal operating conditions. Normalization of energy consumption is achieved using adjustment models that account for routine events, and other adjustments to account for non-routine events so that consumption in baseline and reporting periods can be directly compared, as if all relevant variables were the same in the two periods. Normalized baseline period and/or reporting period energy consumption are calculated using one or more adjustment models.

Normal Operating Conditions

Normal operating conditions should reflect expected operating conditions and occupancy. This includes long-term average weather⁷ conditions for the climate zone corresponding to the building location . Normal production and occupancy should be based on observed pre and post-treatment values.

Operational

Operational activities are control-based; they improve or adjust existing controls to optimize equipment performance. Operational activities include maintaining room temperature set points, revising equipment operating schedules consistent with current building occupancy schedule, and changing equipment set points in response to current weather conditions.

Program Influence

The Program Implementer shall confirm program influence using methods or strategies to screen and/or target potential participants in such a way as to manage the risk/reduce the incidence of free ridership. This is not the same as net-to-gross measurement or analysis, which is conducted through CPUC-led impact evaluation activities only.

Repairs

Minor Repairs

Activity that requires tools, parts and or/equipment to return a system or system equipment to operating condition. Tools and parts are simple and costs are minimal.⁸

Major Repairs

⁶ Referred to as “Standard Conditions Normalization” in the SEM Guidelines.

⁷ Long term average weather defined as the California Energy Commission climate data (2010 version) for each of the 16 Title 24 climate zones.

⁸ Ibid.

DRAFT

Activity requiring substantial expenditures, tools, parts, equipment and material to return a system back to its normative state.⁹

Reporting Period (also referred to as Post-Implementation Performance Monitoring or Performance Period or Post-Installation Metering Period)

The Reporting Period is the period of time over which the savings from energy efficiency interventions and retrofits are measured. The reporting period immediately follows the implementation period.

Retrocommissioning

A systematic process of identifying and implementing operational and maintenance improvements to achieve the design intentions consistent with the current usage of a building. The process is designed to improve the performance of building subsystems as well as optimize the performance of the overall system. Retrocommissioning focuses on operations and maintenance improvements and diagnostic testing, although major repairs and equipment upgrades may be identified and recommended through the process. Minor repairs required to conduct diagnostic testing may also be implemented.

Behavioral, Operational, Maintenance and Repair measures may be identified and carried out during a retrocommissioning project. Behavioral, operational and maintenance activities may also be implemented separately as "operations and maintenance" projects in existing buildings.

Routine Adjustments

Routine adjustments account for regularly fluctuating factors that affect energy use in a predictable manner and are variable in the baseline and/or reporting periods. Routine adjustments typically account for factors such as weather, occupancy and/or production volume. Routine adjustments are made through the inclusion of independent variables in the baseline and reporting period adjustment models.

Strategic Energy Management (SEM)

Strategic Energy Management is a holistic, whole-facility approach that focuses on business practice change from senior management through staff, affecting organizational culture to reduce energy waste and improve energy intensity. SEM emphasizes equipping and enabling plant management and staff to impact energy consumption through behavioral and operational change. While SEM does not emphasize a technical or project centric approach, SEM principles and objectives may support capital project implementation.¹⁰ "Strategic Energy Management" as used by the CPUC refers to specific, standalone programs designed by consultants to the investor owned utilities.¹¹

⁹ Ibid.

¹⁰ Based on Consortium for Energy Efficiency Definition, available at https://library.cee1.org/system/files/library/11283/SEM_Minimum_Elements.pdf.

¹¹ The "Strategic Energy Management – California Industrial SEM Design Guide" and the "Strategic Energy Management – EM&V Guide" are available at <https://pda.energydataweb.com/> and can be found by entering *Strategic Energy Management* in the search box. The Guides are considered living documents that may be updated

3. Program Level Requirements

A. Custom Program and Projects Classification

- 1) Program and projects using normalized metered energy consumption to measure savings at a building, site or project level will be classified as Custom and will follow all established Custom Programs/Projects rules and requirements.
- 2) Any changes to existing Custom processes, procedures rules and regulations shall apply to programs and projects utilizing normalized metered energy consumption methods unless otherwise stated.

B. Implementation Plans

Programs leveraging normalized metered energy consumption to measure savings and/or inform the amount of financial incentives to customers or the amount of compensation offered to implementers or contractors must submit an Implementation Plan, consistent with Decision 15-10-028, Appendix 4, and include the following:

- 1) A program level **Measurement and Verification Plan** (M&V Plan) that provides the following:
 - a) Methodology, analytical methods and tools employed for calculating Normalized Metered Energy Savings (gross savings) resulting from the energy efficiency measures installed and not influenced by unrelated changes in energy consumption;
 - b) Data collection plan;
 - c) Approach to ensure adequate monitoring and documentation of energy savings for each project over the reporting period;
 - d) A method of identifying and adjusting for non-routine events;
 - e) Method of determining program influence;
 - f) Programs targeting savings that comprise less than 10% of annual consumption must provide a rationale and explanation in the Implementation Plan of how savings will be distinguishable from normal variations in consumption.
- 2) A description of the incentive structure, including:
 - a) A description of which entity receives compensation at each stage of the project; and
 - b) Method(s) and tools utilized in the calculation of incentives and/or compensation.
- 3) Compliance with Decision 17-11-006 Ordering Paragraph 2 for programs targeting to-code savings.

“The investor owned utilities shall ensure that all program proposals and program implementation plans, for programs that target (or will claim) to-code savings, describe what program design elements, data collection activities, and/or analyses will be conducted to help lend insight into the following questions as part of the planned implementation of the proposed program:

 - a) *Where does the to-code savings potential reside? What equipment types, building types, geographical locations, and/or customer segments promise cost-effective to-code savings?*
 - b) *What kinds of barriers are preventing code-compliant equipment replacements?*
 - c) *Why is natural turnover not occurring within certain markets or for certain technologies?*
 - d) *What program interventions would effectively accelerate equipment turnover? “*

C. Permissible Project Types

Normalized metered energy consumption projects must occur in existing buildings and shall primarily consist of accelerated replacement measures,¹² add-on measures, whole

¹² A measure or project may be classified as Program Induced Accelerated Replacement classification, or simply Accelerated Replacement, when the program has induced the replacement rather than merely caused an increase in efficiency in a replacement that would have occurred without the program influence. Program influence must

building/building envelope measures, and/or behavioral, retrocommissioning, and operational measures, including maintenance and repair measures.

Normalized metered energy consumption methods are not permissible to calculate savings for new construction projects.¹³

NMEC **is not** permissible for Industrial operations and maintenance (O&M) or behavior, retrocommissioning, and operations (BROs)-type projects **except** as a component of Commission defined Strategic Energy Management Programs.¹⁴

Industrial buildings to the extent the project is similar to one that would be carried out in commercial building.¹⁵

D. Expected Impacts as a Fraction of Total Billing

- 1) Projects should maintain a minimum threshold of expected savings for normalized metered energy consumption projects at 10% of annual consumption.¹⁶
- 2) Programs targeting savings that comprise less than 10% of annual consumption must provide a rationale and explanation in the Implementation Plan of how savings will be distinguishable from normal variations in consumption.

E. Incentives¹⁷

- 1) A portion of customer and implementer incentives shall be based on NMEC-determined performance.
- 2) Pay for performance shall include a minimum of 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 shall be designed to mitigate the risk that potential up-front payments may exceed the value of realized savings.
- 4) Incentives should reflect incremental measure cost for normal replacement measures and should not be paid for customer activity that would have happened in the absence of the program intervention (see Qualifying Measures for minimum repairs rules).

be established by preponderance of evidence. Defined in D.11-07-030, clarified on D.12-05-015 and renamed in Resolution E-4818.

¹³ See Ordering Paragraph 3 of Resolution E-4818: “We direct the Program Administrators to apply a code baseline in cases where there is no reference operation for existing conditions, including new construction, expansions, added load, and projects that occur concurrently with a change in ownership or a lessee, or a change in the function of the space (e.g., office to laboratory), or a substantial change (i.e., 30% or more) in design occupancy.”

¹⁴ See Decision 18-01-004 “We clarify that this SEM program is the only program in which NMEC currently may be used to assess savings in industrial facilities from operations and maintenance (O&M) or behavior, retrocommissioning, and operations (BROs)-type activities”.

¹⁵ See Decision 16-08-019, p. 39 “to the extent there are building-related projects in the industrial sector similar to those in the commercial sector, those types of projects in the industrial sector may also receive an existing conditions baseline, consistent with our approach for the commercial sector”.

¹⁶ Assigned Commissioner and Administrative Law Judge’s Ruling Regarding High Opportunity Energy Efficiency Programs or Projects (12/30/2015) , Attachment A, p. 6

¹⁷ Assigned Commissioner and Administrative Law Judge’s Ruling Regarding High Opportunity Energy Efficiency Programs or Projects (12/30/2015) , Attachment A, pp. 11-12

- 5) Incentives for behavioral, retrocommissioning, and operational measures shall only be paid once participant commits to a maintenance plan for a minimum of two years (evidence should be made available to Commission staff upon request).

F. Qualifying Measures

In a program using normalized metered energy consumption to measure gross savings, the following measures are permissible:

- 1) Measures currently allowable through the deemed and calculated energy efficiency programs.
- 2) Normal replacement measures are permissible as long as total normal replacement measures do not exceed 50% of the entire projects savings estimates.
- 3) Behavioral, retrocommissioning, operational measures are permissible, including maintenance and repair, per compliance with these requirements:
 - a) The program participant or project owners must commit to a repair and maintenance plan for a minimum of two years via a signed two-year customer agreement under which the repair and maintenance activities will continue;
 - b) Program participants or project owners must commit to carry out a minimum set of improvements based on criteria established by the Program Administrator at their own cost;
 - c) Continuous feedback for the building operator (or home owner) to sustain savings;¹⁸
 - d) Use of appropriate analytical methods by which potentially small changes in consumption can be attributed to operational effects, versus other effects;¹⁹
 - e) Detailed documentation of the operational interventions;²⁰
 - f) A detailed data tracking plan;²¹and
 - g) Monitoring period shall last a total of 24 months. After 12 months PAs shall submit a Final M&V Report documenting the first year and lifecycle savings claim based on 12 months of monitoring. After 24 months PAs shall submit an updated Final M&V report, documenting any changes that need to be made to savings claims based on the full 24 months of monitoring.²²
- 4) Program Administrators shall include training components in all repair and maintenance program offerings in order to ensure participants understand the value of preventive maintenance and good operational practices.²³
 - a) This requirement should be carried out by qualified professionals.

¹⁸ Assigned Commissioner and Administrative Law Judge's Ruling Regarding High Opportunity Energy Efficiency Programs or Projects (12/30/2015) Attachment A, at 9

¹⁹ ibid

²⁰ ibid

²¹ ibid

²² ibid

²³ Assigned Commissioner and Administrative Law Judge's Ruling Regarding High Opportunity Energy Efficiency Programs or Projects (12/30/2015) at 22-23

G. Cost Effectiveness and Measure Cost

- 1) Existing cost effectiveness policies apply to normalized metered energy consumption programs and projects.
- 2) Full measure cost applies to all projects and measures that use an existing conditions baseline, per D.16-08-019.²⁴ Full measure cost is the full cost of equipment and labor, including installation, for the measure.
- 3) PAs are required to report project costs and savings estimates²⁵ (see Project Level Requirement section below for savings estimates guidelines) until final claims are submitted.

4. Project Level Requirements

A. NMEC Project Stages and General Description

Project Feasibility	<ul style="list-style-type: none"> • Test the feasibility of NMEC approaches on target population or buildings. See LBNL Option C Technical Guidelines Document for proposed method.
Project Application	<ul style="list-style-type: none"> • Submission of project documentation to Program Administrator (see Reporting Requirements Section). • Program Administrator submits a list to CPUC as per Custom projects review rules (see Reporting Requirements Section). • Projects should have estimates of energy savings and incentive payments. • M&V Plan and demonstration of feasibility of normalized metered energy consumption analytical approach. • The Commission staff may select a sample of projects for review and input. <ul style="list-style-type: none"> ○ Commission staff will provide feedback on the project and its documentation, including but not limited to, M&V Plan, analytical methods and data collection approaches proposed.
Project Implementation	<ul style="list-style-type: none"> • Installation and commissioning of energy efficiency measures. • The Project implementation stage should last no more than 18 months; otherwise the project shall be re-baselined.
Reporting Period, or Post-Implementation Performance	<ul style="list-style-type: none"> • The reporting period stage begins once the measures are installed, working and producing savings. • Reporting period stage shall last no less than 12 months for capital

²⁴ D.16-08-019, Page 34: "... when the baseline is set based on existing conditions, the full savings amount between the existing condition and the new measure installed will be counted towards the benefits of the project. However, on the cost side, this also means that the cost of the measure will be, in most instances, the full measure cost, and not just the incremental measure cost as it was with the prior baseline policy."

²⁵ Assigned Commissioner and Administrative Law Judge’s Ruling Regarding High Opportunity Energy Efficiency Programs or Projects (12/30/2015) Attachment A, at 8

<p>Monitoring Period, or Performance Period, or Post-Installation Metering Period</p>	<p>projects and 24 months for projects containing behavior, retrocommissioning, operational, maintenance and repair measures.</p> <ul style="list-style-type: none"> • It is recommended that implementers check the data being collected 1 to 2 months into monitoring period to ensure appropriate monitoring is occurring, any necessary adjustments should be documented in the Final M&V Report. • In addition to the review at four-months described above, projects should be monitored periodically for deviations from expected savings to identify and adjust for non-routine events. All adjustments should be documented in the Final M&V Report
<p>Final M&V Report</p>	<ul style="list-style-type: none"> • The Final M&V Report documents the activities carried out per the M&V Plan. • The Final M&V Report documents data collection (pre-and post-installation), adjustment models and all findings related to routine and non-routine events. • The Final M&V Report presents the first year and lifecycle savings claims, final avoided energy use and final normalized energy savings.

B. Project Baseline Adjustment

Refer to LBNL Option C Technical Guidelines Document in Technical Guidelines Section for further clarification of the requirements in this section.

- 1) The baseline adjustment model must span no less than a 12-month period.
- 2) The baseline must be adjusted for normal replacement measures included in the scope of the project.
- 3) The baseline energy consumption shall be adjusted for non-routine events, as needed. See Technical Guidelines.
- 4) Baseline adjustment model must be assessed for goodness-of-fit. See Technical Guidelines for proposed thresholds.
- 5) It is strongly suggested that projects be screened for feasibility of proposed methods. See Technical Guidelines.
- 6) If the implementation phase lasts more than 18 months, projects must be re-baselined to adjust for potential changes in coverage, normalization conditions and consumption.

C. Project Savings Estimates

- 1) Avoided Energy Use is acceptable for project level estimates.
- 2) Savings estimates may be based either on deemed assumptions or engineering or modeling methods. The methods chosen should be documented in the Project level M&V plan and should be appropriate to the project type.
 - a) Estimates should use DEER or workpaper values whenever possible.
 - b) Where DEER or workpapers are not available, assumptions should be documented accordingly.

DRAFT

- 3) Specific sources and rationale substantiating the selection of savings estimation methods must be documented in the Implementation Plan for the program and in the M&V plans for project specific information.
- 4) Specific or nearby weather data for baseline model development and avoided energy use calculations are allowed.
- 5) Project savings estimates must reflect measure level savings to inform expected useful life (EUL) calculations, gross realization rate (GRR) and net-to-gross (NTG) adjustments.
- 6) Project lifecycle savings must be based on a weighted average EUL method, unless staff adopts alternative method for calculation.
 - a) EULs should be based on DEER, workpaper or other Commission adopted values.
 - b) See Technical Guidelines for proposed weighted EUL calculation method.
- 7) The project's gross realization rate adjustments must be:
 - a) Non-BRO measures: 0.9
 - b) Behavior, retrocommissioning, operational, maintenance and repair measures: 0.7
 - c) The above gross realization rate factors will be updated based on CPUC led impact evaluation results.
- 8) Project net-to-gross adjustments must be:
 - a) Based on the net-to-gross for a specific measure type if available in DEER or workpapers; for measure types with no net-to-gross available in DEER or workpapers, a default value should be used, please refer to Technical Guidelines for measure level net-to-gross calculations; or
 - b) Use a sector level default net-to-gross for the entire project.
- 9) Savings estimates will not be used to determine achievement of goals or incentive payments.²⁶

D. Project Savings Claims

- 1) Savings claims must be filed only after the reporting period has completed and the M&V has been finalized.
 - a) Please refer to Qualifying Measures section for instructions for projects containing behavior, retrocommissioning, operational maintenance and repair measures.
- 2) Savings claims must be normalized by long term weather based on CZ2010²⁷.
 - a) This adjustment should be applied to the baseline and reporting period.
- 3) Savings claims shall be substantiated by an M&V Report, consistent with the specifications in the Project M&V Plan.
 - a) Project M&V Report should reflect CPUC ex-ante review recommendations if project underwent review.
 - b) Any deviations from the proposed M&V Plan should be documented and substantiated in the M&V Report.
- 4) Savings claims should reflect the same effective useful life, gross realization rate and net-to-gross used to adjust savings estimates.

²⁶ Assigned Commissioner and Administrative Law Judge's Ruling Regarding High Opportunity Energy Efficiency Programs or Projects (12/30/2015) Attachment A, at 8

²⁷ CZ2010 weather data available from the California Energy Commission for each of the 16 Title 24 climate zones.

DRAFT

- a) Deviations from methods used to calculate savings estimates should be documented and substantiated.

E. Changing savings calculation methods

- 1) It is possible that normalized metered energy consumption may not work in certain projects due to building characteristics or unforeseen events. In the event of the savings approach changing prior to a final claim submission, the project must be re-filed. All rules for alternative method chosen, i.e. deemed or custom, must be followed when re-calculating savings claims.
- 2) Program Implementation Plan and M&V Plans must detail methods for tracking feasibility of the normalized metered energy consumption approach and how normalized metered energy consumption failure will be addressed.

F. Tools, Methods, Analytical Approaches and Modeling software

- 1) NMEC projects are subject to a CPUC-led review of savings estimates methods on a sampling basis and impact evaluation.²⁸
- 2) In order to support these processes, all analytical methods, including tools, algorithms and software used in savings and incentive payment calculations, must be made available to Commission staff and its consultants.^{29, 30}

G. Submetering

Submetering is permissible for normalized metered energy consumption projects. The table below outlines minimum requirements for submetering equipment accuracy.

Energy Source	Meter Type	Minimum Accuracy³¹
Electricity	Solid State True Root Mean Square electric meter or watt transducer. ³²	+/- 0.5% of reading including current transformer accuracy and corrections for installed conditions.
Natural Gas	Positive displacement	+/- 2% of reading
Chilled water / hot water	Solid state Btu meter ³³ with temperature sensors and	Temperature sensors: +/- 0.15F from 32F - 200F

²⁸ Assigned Commissioner and Administrative Law Judge’s Ruling Regarding High Opportunity Energy Efficiency Programs or Projects (12/30/2015) Attachment A, at 7-8

²⁹ PU code 585.(a) Except as provided in subdivision (d), every public utility and business specified in subdivision (b) shall in any rate proceeding or proceeding establishing a fact or rule that may influence a rate, provide the commission with access to all computer models, as defined in Section 1821, which are used by that public utility or business to substantiate their showing in the proceeding.

³⁰ It is possible that in the future, protocols and/or certification schemes for evaluating the performance and accuracy of tools may become available. Once these are developed, the Commission will decide if and how to leverage them.

³¹ Rated accuracy must be maintained through the baseline and reporting periods. Meters and associated sensors must be calibration according to manufacturer’s instructions.

³² Meters must consider bidirectional power flow when equipment is capable of supplying power to the grid.

	flow meter.	Flow meter: +/- 2% of reading over expected flow range Calculator accuracy: +/- 0.1% at 30F delta T.
Steam	Solid state Btu meter ³⁴ with a vortex shedding flow meter, pressure and temperature sensors.	Mass flow meter: +/- 2% of mass flow calculation.

H. Energy Efficiency Savings Performance Incentive (ESPI)

- 1) Savings realized via programs or projects using normalized metered energy consumption to determine gross energy savings will be classified “uncertain”³⁵ and subject to ESPI payments on an ex-post basis.³⁶
- 2) Projects must follow required ESPI reporting requirements.
- 3) Methods for reporting lifecycle savings must be consistent with existing policy.³⁷

³³ Continuous integration of flow and temperature difference required to measure delivered energy (Btu). Energy calculations based on Instantaneous measurements of flow and temperature not acceptable.

³⁴ Continuous integration of mass flow, pressure and temperature required to measure delivered energy.

³⁵ [D. 13-09-023](#) Section 7.2, page 41.

³⁶ Assigned Commissioner and Administrative Law Judge’s Ruling Regarding High Opportunity Energy Efficiency Programs or Projects (12/30/2015) at 13

³⁷ *ibid* at 13