

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA
ENERGY DIVISION

Agenda ID 15445
RESOLUTION E-4818
February 9, 2017

RESOLUTION

Resolution E-4818. Measure level baseline assignment and preponderance of evidence guidance to establish eligibility for an accelerated replacement baseline treatment.

PROPOSED OUTCOME:

- Adopts modifications to state energy efficiency policy toward an existing conditions baseline per Assembly Bill 802 and Decision 16-08-019 and the details described in this resolution.

SAFETY CONSIDERATIONS:

- This Resolution modifies the energy efficiency policy guidelines of ratepayer funded programs, and thus is not expected to have an impact on public safety.

ESTIMATED COST:

- This Resolution will not change the currently budgeted spending of the investor owned utilities. However, this Resolution adopts definitions of energy efficiency savings within the existing building stock that will ultimately impact future estimates of energy efficiency potential upon which budgets are based, which will in turn impact future Energy Efficiency portfolio funding authorizations. Many factors will determine how these policies will alter cost-effective savings potential within investor owned utility (IOU) service territories. It is not possible to offer a reasonable estimate for the changes to savings potential given the available information.

SUMMARY

In October of 2015 California adopted two pivotal pieces of legislation affecting energy efficiency policy in the state. Senate Bill (SB) 350 calls on the California

Energy Commission (CEC), the California Public Utilities Commission (CPUC), and publicly owned utilities to work together to double cumulative energy efficiency savings achieved by 2030. The second, Assembly Bill (AB) 802 calls on the CPUC to authorize investor owned utilities (IOUs) to implement programs that improve the efficiency of existing buildings and take into account all estimated energy usage reductions resulting from measures that bring existing buildings, at a minimum, into conformity with the requirements of Title 24, as well as operational, behavioral, and retrocommissioning activities that are reasonably expected to produce multiyear savings.

Commission Decision (D.) 16-08-019 directs that a working group, organized by Commission staff, to develop consensus recommendations on measure-level baseline assignments and present these recommendations to the Commission in via staff resolution by the end of 2016. Working group activities resulted in an overarching "Working Group Report¹" documenting the varying perspectives of stakeholders, as well as two proposed guidance documents: a measure-level baseline guidance and a preponderance of evidence guidance. The Working Group Report, measure-level baseline guidance, and preponderance of evidence guidance can be found on the CPUC website¹.

Despite a complicated scope and an aggressive timeline, the working group came to agreement on a majority of the issues discussed. The proposals adopted in this Resolution include: key definitions concerning alteration and installation types, and standards for the measure-level baseline treatment for various combinations of these and how they should vary by customer class and program delivery. This Resolution adopts much of the working group guidance, in accordance with a standard of good faith and due diligence with respect to our fundamental obligation to ratepayers and our core mission as it is entrusted by the state of California.

There were only a few issues for which the working group recommendations were not made. A small set of these issues are assigned to the "Track 2 working group" (directed in D. 16-08-019 to address the streamlining of custom ex-ante review and industry standard practice) to receive further consideration through

¹ <http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442451953>

that venue; we anticipate that these issues will be addressed in a future resolution.

BACKGROUND

This Resolution is a result of direction in Decision 16-08-019, issued on August 18, 2016 within Rulemaking 13-11-005. This Resolution presents findings and recommendations resulting from working group activities, organized in accordance with D. 16-08-019 by Commission staff, and implemented with parties and stakeholders. The working group was assigned the task of developing a consensus set of recommendations to address baseline treatment details that could not be fully addressed in D. 16-08-019, due to insufficient record and consensus opinion available at that time.

The new baseline policy is a response to AB802, which calls for the inclusion of all energy usage reductions in the determination of energy savings. That is, we count savings in relation to changes in the efficiency of measures and installations as well as those resulting from behavioral, retrocommissioning and operational (BRO) activities that are expected to produce multi-year savings. AB802 states:

“...the commission <shall authorize> financial incentives, rebates, technical assistance, and support to their customers to increase the energy efficiency of existing buildings based on all estimated energy savings and energy usage reductions, taking into consideration the overall reduction in normalized metered energy consumption as a measure of energy savings. Those programs shall include energy usage reductions resulting from the adoption of a measure or installation of equipment required for modifications to existing buildings to bring them into conformity with, or exceed, the requirements of Title 24 of the California Code of Regulations, as well as operational, behavioral, and retrocommissioning activities reasonably expected to produce multiyear savings. (emphasis added)”

Implementation of AB802 was first taken up in the energy efficiency proceeding (R.13-11-005) on October 30, 2015 via an Assigned Commissioner and Administrative Law Judge (ALJ) Ruling and Amended Scoping Memorandum Regarding Implementation of Energy Efficiency “Rolling Portfolios” (Phases IIB and IIIA of Rulemaking 13-11-005) (hereinafter referred to as the Amended Scoping Memo). The Amended Scoping Memo called for the “Interpretation and

implementation of AB 802 generally and support for implementation of SB 350.” Among the related issues identified in the Amended Scoping Memo was the need to develop new policy for the determination of baseline and the implementation of meter-based measurement of energy savings.

In April of 2016, the CPUC staff published a white paper presenting recommendations for implementing an existing conditions baseline, as required by AB 802. On June 8, 2016 an ALJ Ruling was issued, with the staff white paper attached, seeking public comment.

Decision 16-08-019 considered the comments on the staff white paper and addresses the appropriate baselines that are to be used to measure energy savings for specific programs and measures, including specific provisions consistent with the requirements of AB 802. Section 3.14 of Decision 16-08-019 presents Table 1, copied below, which summarizes the adopted baseline policy.

Table 1. Adopted Default Baseline Policy for All Sectors

| Alteration Type | Delivery | Savings Determination | Shell & Bldg System and Add-On Equipment | Behavioral, Retro-commissioning, and Operational | Normal replacement | Accelerated replacement and repair eligible |
|------------------------------------------------------------------------|----------------------|------------------------------|-----------------------------------------------------|---------------------------------------------------------|---------------------------|----------------------------------------------------|
| New construction, expansions, added load | Any | Any | Code | N/A | Code | N/A |
| Existing buildings, including major alterations | Upstream & Midstream | Any | Code | N/A | Code | N/A |
| | Downstream | Calculated | Existing | Existing | Code | Dual |
| | | Deemed | Existing | Existing | Code | Dual |
| | | NMEC | Existing | Existing | Existing, Program Design | Existing |
| | RCT/ experimental | Existing | Existing | Existing | Existing | |
| Non-building projects, including industrial and agricultural processes | Any | Any | N/A | Existing | Standard Practice | Dual |

Decision 16-08-019 deferred some issues to be addressed in a working group process through which Commission staff and parties would work together to create a consensus set recommendations that fulfill the following objectives:

- Identify the measure-level treatment for baselines, and if these should vary within sectors or program savings determination categories.
- Produce a measure-level table similar to the one presented by PG&E in response to Proposed Decision 16-08-019.
- Create a set of more detailed guidelines for documentation required for repair eligible or accelerated replacement treatment for dual baseline treatment for these types of projects.

D. 16-08-019 further directed that these recommendations should be presented in the form of a staff resolution for Commission approval by the end of 2016.

1.1 Working Group Process

Commission staff convened the working group directed in D. 16-08-019 using contracted facilitators. A public meeting was held on October 12, 2016 to introduce the working group topics and to invite parties to participate. Commission staff and the facilitators worked to ensure participation from a diverse set of stakeholders. Table 2 below summarizes participation by stakeholder group. While the first meeting was more heavily weighted toward implementers (44 percent), representation over the course of the working group process was more balanced across stakeholder groups. Important advocacy groups were represented with regular attendance, though smaller in number.

Table 2. Summary of Working Group Participation

| Organization Type | Number Attending Kickoff | Attended Final Meeting | Attended more than 50% of Meetings |
|--------------------------|--------------------------|------------------------|------------------------------------|
| Advocacy | 2 | 1 | 1 |
| Industry organizations | 2 | 4 | 3 |
| Program Administrators | 17 | 12 | 13 |
| Implementer | 24 | 15 | 13 |
| Commission & Contractors | 9 | 8 | 7 |

The working group held seven weekly meetings after the public kickoff on October 12, 2016. A summary of each working group activity and the corresponding topic is provided in Table 3.

Table 3: Working Group Meetings and Topics

| Date | Event | Topic |
|----------|------------------------------------------|-------------------------------------------------------------|
| 10/12/16 | Public Meeting, all day | Introduce Working Group objectives and recruit participants |
| 10/20/16 | Webinar | Review Working Group process, schedule |
| 10/25/16 | Webinar | Installation category definitions |
| 11/1/16 | Webinar | Measure level assignments |
| 11/8/16 | Webinar | Program influence models |
| 11/15/16 | Webinar | Preponderance of evidence models |
| 11/17/16 | Sub-group conference call | Deemed Preponderance of Evidence standards |
| 11/22/16 | Webinar | Preponderance of evidence details |
| 11/30/16 | In-person working group meeting, all day | Final report discussion |

In preparation for each meeting, the working group facilitators distributed “prompts” and/or online surveys that were designed to gather an understanding of the perspectives and opinions related to the meeting topic. The perspectives and comments of working group participants are documented in the working group report and accompanying guidance documents, poste.

1.2 Product Outcomes

The working group facilitators developed a number of work products. They developed a working group report which describes the activities of the working group in more detail, and summarizes the discussions that were held and the perspectives offered by the various working group members. The facilitators also drafted two guidance documents, a measure-level baseline guidance document and a preponderance of evidence guidance document.

The measure-level guidance document presents definitions and discussions of the alteration types and installation types referenced in Table 1 of D. 16-08-019. This document also presents proposed definitions for key concepts, including existing conditions baseline, code baseline, dual baseline, and accelerated replacement measures.

The preponderance of evidence guidance also presents some key definitions, including accelerated replacement, normal replacement and preponderance of evidence. Sections 4 through 7 of that guidance document present the following:

- Section 4: *Direct-to-decision and Direct-to-Default Baselines*, wherein a standard for streamlining or automating approval for accelerated replacement baseline treatment is proposed.
- Section 5: *Full Site Based Preponderance of Evidence Based Assessment for Custom Measures* wherein a “full rigor” scoring and assessment process is described and examples of evidence and documentation are presented.
- Section 6: *Simplified Site-Based Preponderance of Evidence Protocol for Custom and Deemed Measures* offers two tiers of simplified assessment standards for projects within certain incentive ranges (Tier 2 applies to incentives less than \$25,000. Tier 1 applies to incentives between \$25,000 and \$100,000).
- Section 7: *Program Level Preponderance of Evidence-Based Assessment for Deemed Measures* presents a process through which program rules and workpapers may be used to pre-qualify measures as accelerated replacement.

NOTICE

Energy Division issued the draft Resolution as ordered in Ordering Paragraph 4 D.16-08-019.

DISCUSSION

1.3 Measure Level Baseline Guidance

This section presents the measure-level baseline guidance, the recommendations of the working group, and the resulting policies adopted by the Commission.

1.3.1 Baseline Treatment

1.3.1.1 Code Baseline

The working group created a prioritized list of references for using a code baseline. Code baseline has been the default baseline for California IOU energy efficiency programs for a long time. However, some working group members suggest that current implementation of code baseline might be more accurately termed as an Industry Standard Practice baseline to reflect the fact that in some cases, standard practice falls short of or, alternatively, exceeds existing codes. The working group's proposed definition of code baseline applies Title 24 (part 6) building code, regardless of whether there is a standard practice that exceeded code.

Consistent with the perspective of PG&E and others, establishing this type of clarity on the application of code baseline was not within the assigned scope of the working group and we choose not to adopt this proposed definition at this time. However, we recommend that the upcoming working group directed in D.16-08-019 to address topics related to streamlining custom ex-ante review and clarifying the application of industry standard practice consider the issue of code baseline determination as well.

1.3.1.2 Existing Conditions

The existing condition will be interpreted and applied in a broad range of circumstances, and will inform the development of new programs and measures. The working group's measure-level baseline guidance document proposes a definition of the existing condition. However, before addressing that definition directly, we present a contextual discussion that informs consideration of the proposed definition.

What is the Existing Condition?

The question of how to define the existing condition is an important one, and not a simple one. The text of AB802 indicates the energy savings should reflect reductions in energy usage resulting from:

- Adoption of a measure or the installation of equipment that modifies existing buildings to bring them into compliance with code or to exceed code, and
- Energy use reductions due to operational, behavioral, and retrocommissioning activities reasonably expected to produce multi-year savings

Defining an existing condition baseline is challenging because at any given time, some of the equipment within the current stock of existing buildings will be performing sub-optimally. That is, performing at less than its rated or designed efficiency level. This happens for a variety of reasons, some of which go well beyond normal wear and tear, such as deferred or improper maintenance, improper configuration, improper installation, and/or improper application.

When sub-optimally performing, equipment is replaced, the resulting change in energy consumption reflects the savings of the equipment upgrade, as well as those associated with correcting some (or all) of the factors that led to sub-optimal performance.

The savings from restored maintenance, configuration, and usage behave differently over time, and have a shorter effective useful life than the equipment they address. BRO programs have an effective useful life of one to three years; Decision 16-08-019 adopted a two-year life for behavioral programs in non-residential settings and a three-year effective useful life for retrocommissioning and operational programs.

Use of normalized metered energy consumption (NMEC), randomized control trials, and/or experimental design help account for suboptimal performance or varying existing conditions within populations. NMEC savings determinations account for savings only as they are verified using measured data. Thus, performance is monitored, and accounted for as it is demonstrated, which is an appropriate way to track potential degradation of efficiency savings over time. Randomized control trials and experimental design rely on population comparisons, so they reflect what could be described as "standard practice baseline" for the maintenance and repair component of savings, which is a reasonable approximation of "well maintained" equipment standard to be used as existing conditions baseline.

Deemed and calculated savings determination methods, however, may be based on performance assumptions and short-term metering that do not reflect actual long-term operating conditions, which makes the determination on an existing condition baseline difficult. If performance improvements that are due to alleviating maintenance and repair issues are bundled with the improvement in equipment efficiency, the implied assumption is that the combined savings will persist over the life of the measure, which may be optimistic given that it assumes the customer's behavior that led to the substandard operating condition will change when the new equipment is installed. This assumption would also be inconsistent with the effective useful life of three years for retrocommissioning and operational measures adopted in D.16-08-019.

At present, neither deemed savings nor calculated projects generally allow savings from fixing deferred maintenance issues. Most rely on International Performance Measurement & Verification Protocol (IPMVP) Options A² and B³, where the baseline efficiency is deemed or estimated through engineering analysis, and performance monitoring is done in the post-period only.

The working group's measure-level baseline guidance document⁴ offers this definition of existing conditions baseline:

“An existing baseline refers to the actual load-serving operation of the existing equipment prior to its replacement, adjusted, where applicable, for the post-installed operation. The existing operations can be suboptimal, but it must reflect equipment performance that maintains essential

² Option A. Partially Measured Retrofit Isolation: Savings are determined by partial field measurement of the energy use of the system(s) to which an ECM was applied, separate from the energy use of the rest of the facility. Measurements may be either short-term or continuous. Partial measurement means that some but not all parameter(s) may be stipulated, if the total impact of possible stipulation error(s) is not significant to the resultant savings.

³ Option B. Retrofit Isolation: Savings are determined by field measurement of the energy use of the systems to which the ECM was applied, separate from the energy use of the rest of the facility. Short-term or continuous measurements are taken throughout the post-retrofit period.

⁴ <http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442451953>

services. In order to use an existing baseline, the existing equipment is expected to be able to meet customer current and anticipated future requirements (e.g., for the remaining life of the equipment). In the case of 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 (e.g., 30% or more) in the design occupancy there is no reference operation for existing conditions and the pre-existing conditions may not be applicable to the project.”

This definition indicates that sub-optimal performance due to deferred maintenance and repair issues is legitimate to assume in the existing conditions baseline, with the caveat that equipment meet current and anticipated load.

AB802 asks us to count savings from both equipment upgrades and BRO improvements, but does not explicitly imply that we mix the results of one with those of the other. If we incorporate all non-catastrophic failures of the existing equipment into the baseline, we are essentially procuring BRO savings within a capital expenditures framework, and assuming those savings will persist over the life of the equipment, instead of the two or three-year life that BRO measures can be expected to offer. As we endeavor to meet net lifecycle savings goals, it will be important to differentiate savings gained from capital improvements from those resulting from BRO measures.

The working group report elaborates on the definition of existing conditions shown above, to say:

“Implications of this requirement include the following:

The existing baseline required to maintain essential services is the equipment restored sufficiently (at least in theory) to service the load.

Examples follow:

- A pump where the performance has degraded to where it can no longer maintain head pressure is not providing essential service, and the actual existing baseline for the pump must be adjusted to meet the head requirements.

- A pump where the performance has degraded but it still can maintain head pressure is providing essential service, and the actual operation of the pump may be used as the existing baseline.

The existing baseline for non-essential controls is their actual performance prior to replacement, even in a suboptimal state. The existing baseline for controls required for essential services is the restored state.

- Lighting occupancy control is not an essential building service. Occupancy controls are often overridden, broken, or not optimized for the application. The existing baseline for lighting controls should reflect their actual operation, including the effects of the overrides and poorly implemented strategies. “

We do not have an objection to these definitions, necessarily. However, as noted earlier, the assumption that currently observed (inefficient) settings or operational patterns will not persist post-installation is likely to be overly optimistic, since it assumes a behavior that the customer is not currently exhibiting. Given these issues, the following clarifying policies are part of the definition of an existing conditions baseline for use within a deemed or calculated savings determination:

- An existing conditions baseline reflective of poor maintenance and disrepair applies only to BRO installation types.
- All activities and installations that restore equipment performance to its nominal efficiency (i.e., rated, intended, or original efficiency) but do not enhance the nominal efficiency must be classified as BRO, and where applicable should adhere to the HOPPs Ruling and with the guidance presented on page 26 of this Resolution (in the subsection titled *Repairs, Optimization, and Replacement of Existing Add-On Equipment*).

When is the Existing Condition Undefined?

Most agree that the intention of AB 802 is to unlock potential efficiency savings within the existing building stock by measuring savings against current performance. There is no existing condition that would apply to a newly constructed building, or to the expansion of space, or the addition of new load. These activities are associated with a code baseline per Table 1 of D. 16-08-019.

The working group recommends expanding the set of circumstances under which no existing condition can reasonably be defined, as follows:

“In the case of 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 (e.g., 30% or more) in the design occupancy, there is no reference operation for existing conditions and the pre-existing conditions may not be applicable to the project.”

We adopt this expanded set of conditions for which no existing condition is defined, but we modify the language to read:

“In the case of 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 (e.g., 30% or more) in the design occupancy, there is no reference operation for existing conditions and the pre-existing conditions *are* not applicable to the project.”

1.3.2 High-Efficiency Operation

The working group guidance document proposes two definitions of energy efficient operations: improved operation and restored operation. The rationale for developing these definitions was to assist in classifying measures and calculating savings. More specifically, it was to create context for applying the qualifying principles presented in the previous section of this Resolution, stipulating that for deemed and calculated savings determinations, BRO is the appropriate classification wherever sub-optimal performance represents the existing conditions baseline, and for all measures that offer *only* a restorative component of savings.

The definitions themselves, however, were disconcerting to some working group members, perhaps due to their presentation in the guidance document that is absent a direct contextual framing tying the definitions to their role in the installation type definitions. The definitions are as follows:

- “Improved operation – In this case, the high-efficiency measure is nominally more efficient than the pre-existing system as demonstrated by an increase in name plate efficiency or an improvement in the operational specifications of the equipment.

- Restored operation – In this case the high-efficiency measure restores the pre-existing equipment efficiency. These measures entail like replacement of equipment, repair of equipment, or non-hardware operational changes.”

We find these definitions offer a useful reference and language for articulating standards, and determining the appropriate installation type for measures. For these reasons, we adopt them.

1.3.3 Effective Useful Life, Remaining Useful Life, and Measure Cost Definitions

The working group included current definitions and policy that define effective useful life, remaining useful life and measure costs. These do not represent a change, and were not within the assign scope of the working group. They are accepted as existing policy.

1.3.4 Alteration Type

1.3.4.1 New Construction, Expansions, Added Load

The working group reiterates language from D. 16-08-019 in the draft baseline guidance document definition of the new construction alteration type. As before, and per D. 16-08-019, new construction is an alteration type for which a code baseline must be used. In addition, we note that new construction is an alteration type for which no existing condition is defined.

“The new construction alteration type includes new equipment that has been installed in any one of the following:

- a) New building projects wherein no structure or site footprint presently exists
- b) Addition or substantial expansion of an existing building or site footprint
- c) Expansion or addition of substantial load to an existing facility

All new construction projects use a Code baseline.”

1.3.4.2 Existing Buildings and Non-Building Projects

The working group measure level baseline guidance document offers definitions of “existing buildings” and “non-building projects.” These definitions seem

reasonable and they appear sufficient for the intended purpose. For these reasons, we adopt them in this Resolution.

1.3.5 Delivery and Savings Determination Type

1.3.5.1 Program Delivery

The working group's proposed guidance document offers definitions for programs that should be categorized as upstream/midstream, and those that are considered downstream programs. The distinction is important to the application of baseline, of course. Per Table 1 of D. 16-08-019, upstream and midstream programs are counted against a code baseline in all cases, while a downstream program may receive different baseline treatments.

Programs that are offered through contractors interacting with customers are generally considered downstream, though not all provide rebates directly to customers. The definition offered in the measure-level baseline guidance document states that downstream measures "target" end-use customers, and that they "typically" offer incentives to customers.

We take this opportunity to clarify that downstream programs should involve program agents (including contractors) directly interacting with participating customers. Also, Program Administrators should ensure implementers maintain records for downstream program claims for each participating customer. We can adopt the guidance document definition, with the addition of the following descriptive text:

"Programs can be classified as downstream when they are delivered by agents or representatives (including installation contractors) of the program that have direct interaction with end-use customers. Downstream programs must maintain site-specific records for program activities and installations resulting in energy savings. These records must include utility account number, installation site address, and evidence required by the applicable preponderance of evidence standard. In some cases preponderance of evidence standards will consist of evidence of program eligibility and adherence to program rules."

1.3.5.2 Savings Determination

Section 4 of the working group measure-level baseline guidance document describes a principle of savings determination, as follows:

“Methods for determining savings, regardless of the determination type, should use a congruent approach when characterizing the pre- and post-project conditions - e.g., the efficiency rating of pre-existing equipment is compared with the efficiency rating of installed equipment, or the metered performance of the pre-existing equipment is compared with the metered performance of the installed equipment.”

This principle is important for the following reasons:

- It avoids the possibility of using a baseline reflective of deferred maintenance while assuming that the installed efficiency persists over the life of a measure.
- It allows for the simplicity of assessing the current and future operational efficiency using rated efficiencies.
- Directs that a comparable circumstance and method be applied to both the pre and post period measurements in all cases.

As such, we adopt this principle as written in the measure-level baseline guidance document.

Deemed Measures

The third paragraph of Section 4.2 of the draft guidance document addresses deemed measures.

“Deemed measure savings rationale, methods and parameters are documented in work papers. A deemed measure work paper establishes the existing and high efficiency baselines, the EUL and RUL of the measure, the measure cost, and the preponderance of evidence requirements for accelerated measure types.”

We adopt this definition and highlight the addition of “the preponderance of evidence requirements” for accelerated measure types. While the details of the work paper process are not within the assigned scope of the working group, there is a need to create an avenue through which deemed measures could apply an existing conditions baseline. In general, the deemed characteristics that are

used to calculate and verify deemed measure savings cannot be site specific. The use of site specific equipment information in determining savings implies the measure is custom (or calculated). For this reason, the application of existing conditions baseline to deemed measures must involve approved workpapers that establish reliable aggregate data reflective of the existing condition and circumstance (buildings, customers, climate zones, etc.) where a measure is applied.

Existing conditions are much more variable than code conditions. This fact exacerbates the potential for error in determining reasonably assured deemed savings values for existing conditions baseline. On the other hand, variance in the existing condition might be largely explained by observable parameters, and where this is the case, the variance of existing condition will be lower within the sub-population defined by those parameters. Thus, we encourage the Program Administrators to examine sub-populations where there are similar existing conditions, and to assess the vintage, efficiency and natural turnover of equipment therein to identify program opportunities with reasonably predictable savings. Examples of observable parameters that may predict or explain existing conditions include: building type, building size, business type, business size, business activity, equipment type, building ownership (own versus rent), lease length, local economic conditions and climate.

Additional discussion of deemed measure considerations can be found in the section titled *Deemed Measure Preponderance of Evidence* on page 41 of this Resolution, and Section 7 of the preponderance of evidence guidance document.

1.3.6 Installation Type

Definitions of installation types were one of the key issues in the measure level baseline working group. Shell and building systems is a relatively new concept, and not a segmentation that is currently built into the portfolio of measures. The installation type issues of concern include:

- What should be included in the shell and building system category? (Working group members were not confused by the definition or intent of the category, but more concerned about how to apply those concepts to the portfolio of measures.)

- Would an initial allocation of a measure to the shell and building system category prevent a program administrator from offering the measure within a normal replacement framework?
- If measures are fungible in this way, what potential compromises does this represent for the integrity of the portfolio?

1.3.6.1 Shell and Building System

The proposed definition of shell and building system (SBS) in the baseline guidance document is as follows:

“A shell and building system (SBS) measure improves from the nominal efficiency of pre-existing equipment that is otherwise expected to perform essential building functions throughout the course of a building’s life cycle, without regular replacement.”

The baseline guidance document offers the following clarifications:

“SBS measures improve the efficiency of equipment that does not burn out or when they do burn out the building can function without them, thus, this equipment is typically not replaced unless there is a major building renovation. An SBS measure must be a nominal energy efficiency improvement over the existing equipment.

Wall and pipe insulation, windows, and ducts are expected to last through the building life cycle without scheduled replacement. This equipment is eligible for SBS treatment. A roof itself is expected to be repaired or replaced during the building life cycle and is not considered a building system.

- Lighting systems (hard-wired systems only) provide the essential service of lighting. Fixtures are typically left in place until a major renovation occurs. Lamps and ballasts can be replaced with like technology as they individually fail, maintaining the original system efficiency indefinitely. Therefore, the lighting system (fixtures, lamps, ballasts, and controls) and the replacement of subsystem of ballasts and lamps with a higher efficiency subsystem is a SBS

measure. Lighting controls alone, nor lamps alone, do not qualify as a building system, but could qualify under other installation types.

- Mechanical systems can be expected to be replaced or repaired during the building life-cycle (i.e., boiler, chillers, pumps, air-handlers, motors) in order to maintain essential building services and are categorized as other installation type measures.”

The implications of the draft measure-level baseline guidance discussion and clarification of the category of shell and building systems includes measures that address:

- Improvements to non-mechanical building structures (which might also be characterized as “building weatherization”).
- Improvements to lighting, inclusive of all improvements that are more comprehensive than an exchange of the bulb.

As explained in the section below, we do not accept the categorization of lighting systems as shell and building system measures that do not normally turnover with a building. Therefore, shell and building system measures are limited to non-mechanical building structures, also referred to as building weatherization measures.

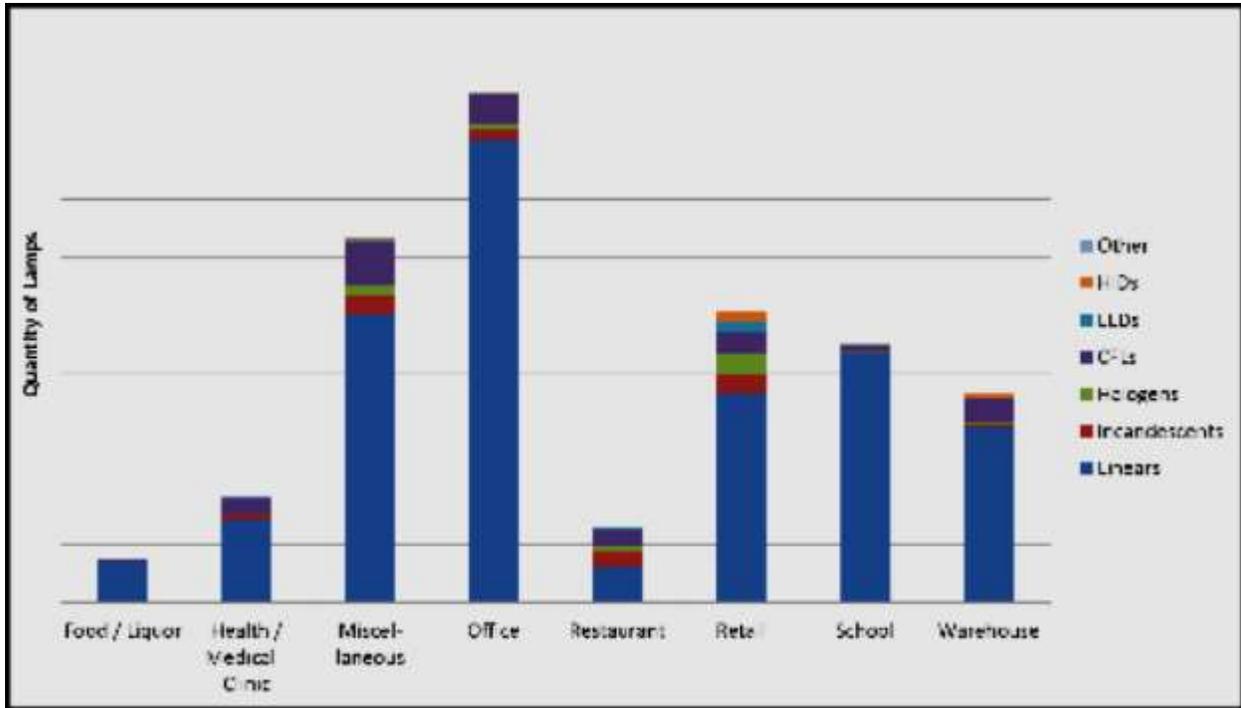
Lighting

Lighting is a crucial energy efficiency measure category. Lighting technologies have offered most cost-effective savings opportunities to date. Lighting also encompasses important components of the stranded savings AB 802 asks us to pursue. It is important to adhere to principles that are consistent and clear. If all other mechanical systems are not qualified as shell and building system because they are likely to be replaced, why is lighting different? This appears inconsistent with the intent of the category given the pervasiveness of lighting measure retrofits in the portfolio in relation to HVAC and other building mechanical systems.

The California Commercial Saturation Survey(CSS) was conducted to assess the saturation and efficiency of mechanical systems and equipment in existing

buildings. The study, published in 2014, included 1,439 on-site surveys, each with a full inventory of indoor and outdoor commercial lighting measures.⁵ Figure 1 below is an excerpt from that study which represents the distribution of interior lighting found in CSS study efforts. The Figure reflects the study finding that 83 percent of all commercial indoor lamps are linear fluorescent.

Figure 1: Interior Lamp Type Distribution by Business Type



As part of the CSS study, attempts were made to collect the age of linear fluorescent systems. A good proportion of these attempts failed, but not all of them. Table 4 below is based on CSS findings and shows the distribution of lighting system installation year for sites where the year could be determined. The data indicate that between one-third and one-half of linear fluorescent lighting systems were installed in the eight years between 2006 and 2014.

⁵ California Commercial Saturation Survey, Prepared for the California Public Utilities Commission by Itron, Inc. August 26, 2014.
http://www.calmac.org/publications/California_Commercial_Saturation_Study_Report_Finalv2ES.pdf

Table 4: Distribution of Linear Lamps by System Installation Year and Business Type - Indoor Lighting

| System Installation Year | Food/Liquor | Health/Medical - Clinic | Miscellaneous | Office | Restaurant | Retail | School | Warehouse |
|---------------------------------|--------------------|--------------------------------|----------------------|---------------|-------------------|---------------|---------------|------------------|
| Pre-1990 | 4% | 29% | 7% | 25% | 14% | 11% | 18% | 5% |
| 1990-1999 | 10% | 12% | 16% | 14% | 9% | 3% | 16% | 12% |
| 2000-2003 | 6% | 8% | 7% | 12% | 6% | 14% | 3% | 9% |
| 2004-2008 | 21% | 18% | 28% | 16% | 29% | 29% | 19% | 19% |
| 2009-2012 | 60% | 33% | 42% | 33% | 43% | 43% | 45% | 56% |
| <i>n</i> | 78 | 60 | 152 | 121 | 98 | 145 | 82 | 74 |

The CSS study assembled data on the wattage of lighting systems and recorded the number of fixtures and bulbs at each site. Table 5 below presents a comparison of the Title 24 building standard (using the “complete building method”) to the CSS study results. Building types where the 2014 CSS results (in watts per square foot) are lower than the Title 24 standard indicate that, on average, interior lighting is code compliant in that building type. These data indicate that lighting systems for many business type categories are code compliant at present, and that greater opportunities for efficiency improvements are found in the Office, Retail, and Health / Medical Clinic business types. Data indicate that it would not be reasonable to assume that lighting would remain below code over the course of building lifetime without program intervention.

Table 5: Interior Lighting Code Compliance in Commercial Buildings

| Building Type | Title 24 Standard ⁶ (watt/ft2) | 2014 CSS* (watts/ft2) |
|-----------------------|-------------------------------------------|-----------------------|
| Warehouse | 0.6 | 0.4 |
| School | 0.95 | 1.0 |
| Retail | 1.0* | 1.2 |
| Restaurant | 1.1 | 1.1 |
| Office | 0.8 | 1.0 |
| Miscellaneous | 1.0* | 0.9 |
| Health/Medical Clinic | 1.0 | 1.2 |
| Food/Liquor** | 1.5 | 1.0 |

* Reflects the “General Commercial Building/Industrial Work Building” category in Title 24.

**Reflects the “Grocery Store” category in title 24.

* The results presented above have been weighted by site weight.

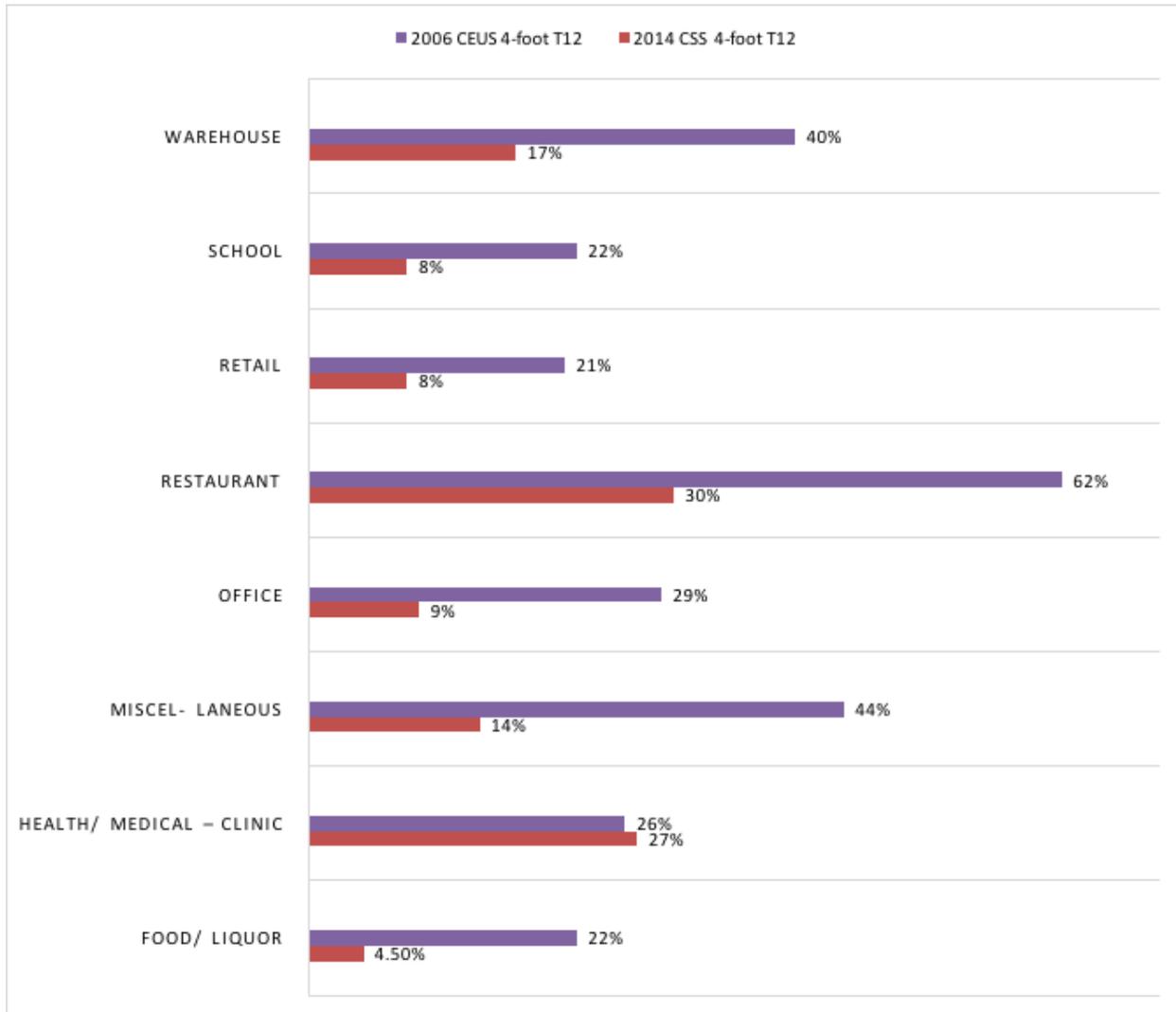
A market study like the CSS study was done in 2006 - the California Commercial End Use Survey (CEUS). Like the CSS study, the CEUS also collected information about lamp type, including the distribution of 4-foot linear fluorescent fixtures across T-8 and T-12 lamp types. There are many varieties of T8 lamp type. The first-generation variety (Series 700) are characterized as a “base” efficiency technology in the CSS report, and there are numerous subsequent generations of T-8s, each with a higher level of efficiency. There are also LED retrofit options for linear fluorescents. In recent years, many lighting retrofits were upgrades of T-8 fixtures from a base efficiency a high-efficiency version. The CSS study collected more detailed categorizations for T-8, but the CEUS study can offer only two categories, T-8 and T-12. Turnover of equipment within the T-8 category cannot be assessed with the data at hand. However, the data does allow us to examine turnover rates within the facilities that were using T-12 linear fluorescent systems in 2006. Figure 2 below illustrates the rate of change over the 2006-2014

⁶ For the 2016 Building Energy Efficiency Standards, Title 24, Part 6, and Associated Administrative Regulations in Part 1. Table 140.6-b Complete Building Method Lighting Power Density Values.

<http://www.energy.ca.gov/2015publications/CEC-400-2015-037/CEC-400-2015-037-CMF.pdf>

period for facilities using a T-12 technology in 2006.⁷ The exhibit shows that for some building types the rate of lighting system replacement is significant.

Figure 2: Distribution of 4-Foot Linear Fluorescents, 2006 CEUS versus 2014 CSS



In addition to issues of lighting system turnover, there is also a need to carefully consider and protect the ongoing viability of lighting measures in the portfolio. Much of the turnover described above is a result of energy efficiency programs.

⁷ It is reasonable to assume no facilities were adopting T-12 technology as a retrofit or new construction option

There are some lighting measures that would be difficult to sustain in a cost-effective portfolio using an existing conditions baseline.

For these reasons, we direct the program administrators to classify lighting with other mechanical systems and treat lighting retrofits as either accelerated replacement or normal replacement subject to a preponderance of evidence via approved workpapers, as described in the deemed and preponderance of evidence discussions in this resolution. We remind stakeholders that the deemed, tiered, and direct-to-decision preponderance of evidence approaches offer an avenue for programs to pre-qualify for a default accelerated replacement baseline.

1.3.6.2 Add-On Equipment (AOE)

The draft baseline guidance document offers this definition of add-on equipment:

“An Add-on Equipment (AOE) measure installs new equipment onto an existing host improving the nominal efficiency of the host system. The existing host system must be operational without the AOE equipment, continue to operate as the primary service equipment for the existing load, and is able to fully meet the existing load at all times without the add-on component. The actual energy reduction occurs at the host equipment, not at the add-on component, although any add-on component energy usage must be subtracted from the host savings.”

The document goes on to present examples that include equipment types and circumstances that have been considered AOE in the past. The example, AOE#6 presents a case where the addition of new energy consuming and fully functional equipment would qualify as an add-on measure. The reasoning behind the modification and an analysis of how it would present opportunities or potential risks is not offered in the guidance document. We do not adopt the implied revisions to the qualifications for AOE at this time given the absence of more detailed analysis and guidelines.

The CPUC website offers several guidance documents under a heading, “Ex Ante Review Custom Process Guidance Documents.”⁸ One of these documents is titled “Early Retirement Using Preponderance of Evidence.”⁹ Section 2.2.5 of this document offers a definition of Add-on Retrofit. We elect to adopt this definition as appropriate to serve as the definition of Add-on Equipment (AOE) for the purposes of measure-level baseline guidance. Accordingly, AOE is defined as:

“...Situations where new equipment has been installed onto an existing system as either an integral additional component or a substitution of a pre-existing add-on component whose primary purpose is to improve overall efficiency of the system. Such a component must not be able to operate on its own. Retro-commissioning measures for which no additional equipment is purchased or measures involving the addition of a variable speed drive to an existing motor drive process will fall under this category.

The EUL of AOE measures is capped at the RUL of the equipment being retrofitted. This means that AOE measures utilize the RUL of the pre-existing equipment up to and not to exceed the EUL for the AOE measure. For example, adding a variable speed drive to a HVAC air-handler or a process motor will have the measure EUL limited by the RUL of the equipment to which the variable speed drive was added. For a more specific example, suppose a variable frequency drive (vfd) is an AOE measure being installed on an existing pump. The vfd and the pump, when brand new, would have a 15 year EULs from DEER, respectively. The DEER default RUL for the pump is the 15 year EUL divided by 3 or 5 years.

To properly determine the savings claim and cost-effectiveness of AOE installations, the following information is required: an approved single baseline energy savings calculation approach and estimate, full measure cost, and a measure EUL with justification.”

⁸ <http://www.cpuc.ca.gov/General.aspx?id=4133>

⁹ <http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=5325>

1.3.6.3 Behavioral, Retrocommissioning, and Operational (BRO)

Measures installed within the BRO installation type are assigned an existing conditions baseline and may include measures that either restore or improve energy efficiency, and can be reasonably expected to produce multi-year savings.

For deemed and calculated savings determination, all measures that capture savings from deferred maintenance, performance restoration and operational characteristics are considered within this category even when they are a component of savings captured through equipment replacement.

Repairs, Optimization, and Replacement of Existing Add-On Equipment

Add-on equipment that breaks or performs poorly may result in increased energy consumption. When broken add-on equipment is fixed or replaced, energy consumption should return to previous levels. Under current deemed and calculated program guidelines, these are ineligible for program savings credit, because the activity is considered part of expected, or “normal” repair and maintenance. However, these types of improvements in some cases may qualify as retrocommissioning. They are also permitted within an NMEC or RCT /experimental design approach, and can qualify as measures under the repair and maintenance rules outlined in the High Opportunity Programs and Projects (HOPPs) ruling released in R.13-11-005 on December 30, 2015.

Similarly, measures that consist of bringing systems that are performing below rated efficiency up to their installed efficiency, such as duct repair or HVAC maintenance, share characteristics of a repair, and require assuming a baseline that is below rated efficiency.

Consistent with current policy, replacement of broken or poorly performing add-on equipment does not qualify as a measure, with these exceptions:

- Use of NMEC, RCT/experimental design to measure savings
- Offered through a BRO program or under the repair and maintenance provisions outlined in HOPPs

We adopt the following text as guidance for the distinction between repairs that are eligible for ratepayer funded programs and those that are not. We acknowledge this was not discussed in the working group, but find that the recommendations of the working group with respect to the application of

existing conditions baseline call for clarifying policy surrounding the distinction between normal repairs and improvements that qualify for energy efficiency program support.

The following defines repairs that are not-eligible for ratepayer supported energy efficiency programs:

Failure of an existing equipment or component whereby the system or process is no longer able to deliver the intended purpose or function. This type of repair leads to a normal required repair or replacement to restore the equipment into service. Without the repair the existing equipment is inoperable so cannot consume any energy or consumes standby energy without performing any function. For example, a compressor breaks in an air-conditioning unit; the air-conditioner unit is no longer able to deliver conditioned air as intended. A similar example is an inoperative compressor in a multi-compressor air conditioner or compressed air system; again, returning this into service to perform the design function, while not improving efficiency, simply restores operation. Backup or redundant equipment required due to continuous operation or service requirements is another example of ineligible equipment.

The following defines repairs eligible for ratepayer supported energy efficiency programs:

Non-essential component(s) of an existing equipment or system that when failed:

- Does not prevent the full system from performing the design function at near design capacity; and
- Reduces the overall annual system efficiency by more than 20%; and either:
 - a) The failure type/component not considered “standard” or “routine” maintenance and there is no requirement to do so to maintain warranty or service coverage or for health and/or safety reasons; or
 - b) The failure typically remains unrepaired for 2-3 years or more and is not no cost or low cost.

In other words, a non-essential efficiency related repair that would not normally be standard or required practice to fix soon after being identified. Non-essential components are those that when failed or not operating as designed or optimally, only reduce efficiency and do not prevent the equipment from delivering the original service or function. Normal maintenance required to maintain warranties on overall systems or components do not fall in this category.

Examples that fall into this category when meeting the above four criteria include: economizers on A/C systems; non-essential heat recovery systems that are not operating fully due to failed controls or sensors; failed controllers or sensors or actuators that do not prevent the overall system from delivering the required end use function at near design capacity; malfunctioning components (i.e., power supplies, switches, motors, etc.) that are consuming 20% or more of design power but are still delivering their design function adequately and are not in impending failure mode or threatening the reliability or longevity of the overall system (whereas failed steam traps or leaking pipes that pose a potential health or safety issue or threaten the overall system integrity or operation are an example of ineligible repairs).

These types of repairs can be the subject of support as part of an activity to bring enhanced maintenance and system optimization practice into standard practice at a facility. The program design should only offer these kinds of repairs in a “start-up” activity to institute an enhanced maintenance at the facility in a manner so as not to simply transfer standard maintenance activities and costs to be a ratepayer funded activity.

1.3.7 Normal Replacement

The draft measure-level baseline document and the draft preponderance of evidence guidance document offer definitions of normal replacement. We adopt this definition.

1.3.8 Accelerated Replacement

The draft measure-level baseline document and the draft preponderance of evidence guidance document offer slightly different definitions of “accelerated replacement.” The version proposed in the draft measure-level baseline guidance

includes a stipulation that the efficiency measure represent an enhancement over the original efficiency of equipment (i.e., the measure offers more than a restorative improvement). It also reminds us that the remaining useful life of the existing equipment must be at least one year. The baseline guidance stipulates three sub-categories of accelerated replacement (repair eligible, repair indefinitely and early retirement) where each is subject to a standard dual baseline approach.

We believe the baseline and preponderance of evidence documents should be aligned with respect to their definitions of accelerated replacement. We adopt the recommendation that accelerated replacement include three sub-categories, and that each be treated equivalently with respect to the dual baseline approach. However, we do not adopt the definition of repair eligible that is proposed in the draft guidance document, due to apparent risk and complexity. A more detailed discussion is presented in the following section.

1.3.9 Repair Eligible

We consider the hypothetical example of a broken boiler, which does not function at all, but could be cost effectively repaired. This represents a decision-point where the customer could be influenced by the program to replace the equipment instead of repair it. Assume further that the customer could provide evidence of previous repairs and their costs, and has already obtained a reliable cost estimate for the repair. In this scenario, if a program were to influence the customer's decision to replace rather than repair, should this be considered an early replacement?

The working group members were in general agreement that what is at issue is whether the equipment could be cost effectively repaired, not simply whether it could be repaired, and that a comparison of repair costs and replacement costs was called for. With this it seems that in order to apply a dual baseline treatment for the replacement of a broken but repairable piece of equipment, at minimum the following data are needed:

- Repair cost
- Replacement cost
- Energy savings (needed for all claims)
- Effective useful life of installed equipment
- Remaining useful life of existing equipment

The draft measure-level baseline guidance document recommendation suggests screening broken equipment that is potentially repair eligible using a comparison of repair costs and replacement costs. It suggests the standard for determining repair eligible equipment be that the costs of repairs are less than 50 percent the costs of replacement. We observe that the higher this cut-off percent is, the closer the equipment is to being economically unsalvageable. We also observe that the difference between the cost of replacement versus repair in combination with the energy savings offered by the equipment replacement determines the project payback period for the customer. That is, for each combination of equipment cost, energy savings, and repair cost period, it is possible to solve for the payback.

Should the defining criteria be based on the payback period, instead of only the repair and replacement cost? It seems that payback period offers more insight to customer decision-making.

If we assume rational decision-making, and had full information about the longevity of the considered repair, then the solution might be to disallow cases where payback (before incentives) is less than the longevity of the repair - i.e., the expected interval between repairs.

We also consider a scenario where repair is relatively inexpensive in comparison to replacement, but that this repair would need to be repeated at short intervals. In this case the best comparable repair cost would represent the discounted cost of a stream of repairs over the EUL of the replacement equipment.

In practice, applying this approach would be burdensome in its complexity and there would be cases with a large variance in estimating the longevity of a repair, and/or costs of future repairs.

These issues would be further compounded by the introduction of sub-optimal performance, and hypothetical repaired efficiency operations into the baselines. The discussions surrounding the use of a repaired efficiency as baseline led to the observation that repairs temporarily restore performance that degrades over time. Use of a degradation factor in the baseline would introduce additional complexity.

The full spectrum of cases to consider in dual baseline is intractable without simplifying principals. (Note these do not apply to NMEC or RCT/experimental design savings determinations.)

- For deemed and calculated savings determinations, existing conditions baselines must reflect rated equipment efficiency, or fully-maintained operational efficiency of the existing equipment. Applying this principal may result in a need to estimate the portion of savings that are retrocommissioning or operational in nature.
- Equipment that is not operational must use a normal replacement baseline.
- All accelerated replacement types (repair eligible, repair indefinitely, early retirement) receive the same dual baseline treatment, consistent with the current definition of dual baseline in the Energy Efficiency Policy Manual. However, equipment older than its EUL may qualify for accelerated replacement baseline treatment if they are determined to be repair eligible or repair indefinitely.

Table 6 below presents possible configurations for dual baseline where repair eligible/repair indefinitely equipment may have the following characteristics:

- They may be older than their EUL
- They may assume repair or replacement scenarios in the 2nd period of the dual baseline
- Equipment may be broken or performing sub-optimally in the 1st period.
- Savings credit is granted for equipment enhancements or performance optimization

Table 6 below is for illustration purposes only. As discussed previously, determining the longevity and costs of hypothetical repairs, and applying baselines that assume a future repair rather than replacement add to the complexity of baseline policy. Furthermore, as illustrated in Table 6 below, the number of scenarios to consider expands quickly creating additional complexity and potential for confusion and misinterpretation. For these reasons, we do not adopt the use of repair cost in determining equipment eligibility-based definitions. Instead we ask the Track 2 working group tasked with streamlining custom ex-ante review and industry standard practice issues to address

qualification standards and evidence to determine repair eligible / repair indefinitely equipment.

Table 6. Illustrative (Not Adopted) Table of Potential Dual Baseline Scenarios Allowing Suboptimal Performance, Performance Enhancements and Non-Operational Repair Eligible Equipment

| Existing Equipment Performance | Older than EUL? | Action Taken | Counterfactual /Baseline action at end of RUL | Measure costs based on difference between action taken and: | 1 st Baseline | 2 nd Baseline | Comments |
|--------------------------------|-----------------|--------------|-----------------------------------------------|-------------------------------------------------------------|-------------------------------------------|-------------------------------------------|----------|
| Broken | N/A? | Replace | Repair again | Discounted repairs over EUL of installed equip | Original Efficiency of existing equipment | Original Efficiency of existing equipment | |
| Broken | N/A? | Replace | Replace | Repair cost and discounted replacement cost | Original Efficiency of existing equipment | Code | |
| Orig Efficiency | Y | Replace | Repair | Discounted repairs over EUL of installed equip | Original Efficiency of existing equipment | Original Efficiency of existing equipment | |
| Orig Efficiency | Y | Replace | Replace | Repair cost and discounted | Original Efficiency of existing | Code | |

| Existing Equipment Performance | Older than EUL? | Action Taken | Counterfactual /Baseline action at end of RUL | Measure costs based on difference between action taken and: | 1 st Baseline | 2 nd Baseline | Comments |
|--------------------------------|-----------------|---------------------------------|-----------------------------------------------|-------------------------------------------------------------|------------------------------------|--------------------------|---------------|
| | | | | replacement cost | equipment | | |
| Suboptimal | Y | Replace | Replace | Discounted future replacement cost | Suboptimal or Original? | Code | |
| Suboptimal | Y | Replace | Repair | Discounted repairs over EUL of installed equip | Suboptimal or Original efficiency? | Original Efficiency | |
| Suboptimal efficiency | Y | Repair to Orig eff. | Repair to Orig eff. | Zero - full cost is incremental | ?? | No Savings | maintenance?? |
| Suboptimal efficiency | Y | Repair to > original efficiency | Repair to Orig eff. | Zero - full cost is incremental | ?? | No Savings | maintenance?? |
| Suboptimal efficiency | N | Repair to Orig eff. | Repair to Orig eff. | Zero - full cost is incremental | Suboptimal? | No Savings | maintenance?? |
| Suboptimal | N | Repair to | Repair to Orig | Zero - full | suboptimal | No Savings | maintenance?? |

| Existing Equipment Performance | Older than EUL? | Action Taken | Counterfactual /Baseline action at end of RUL | Measure costs based on difference between action taken and: | 1 st Baseline | 2 nd Baseline | Comments |
|--------------------------------|-----------------|-----------------------|-----------------------------------------------|-------------------------------------------------------------|-----------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------|
| efficiency | | > original efficiency | eff. | cost is incremental | to more than original efficiency? Or suboptimal to original? | | |
| Suboptimal efficiency | Y | Replace | Repair to Orig eff. | Discounted future repair - * | Suboptimal efficiency or Original efficiency | Original Efficiency | *if using original efficiency in first period - add cost of repair to original |
| Suboptimal efficiency | Y | Replace | Replace | Discounted future replacement* | Suboptimal efficiency or Original efficiency?? | Code | *if using original efficiency in first period - add cost of repair to original |

1.4 Prescriptive or Flexible Baseline Categorization

Some working group members suggest that all measures should be assigned to a default baseline category and, if for any reason a program administrator would like to re-categorize a measure or make an exception to the default category, that this should be restricted and only done through a process where a preponderance of evidence standard is applied.

It has long been Commission policy to require a preponderance of evidence to categorize measures as accelerated adoptions instead of normal replacements, no such standard has been applied to measures when the PA prefers a normal replacement treatment over an accelerated replacement treatment. The reasoning for this non-parallel treatment is:

- Normal replacement baseline treatment represents a lesser claim of program influence than an accelerated replacement/dual baseline treatment;
- Most mechanical equipment is replaced from time to time for reasons independent of program activities;
- Equipment with a high first-cost and a payback period that approaches the effective useful life, assuming normal replacement for purposes of baseline selection is reasonable.

Moreover, cost effectiveness policy requires the use of full measure cost to measures receiving an existing baseline treatment. Full measure cost includes demolition of existing equipment and all the labor and materials required for installation of the equipment. Many measures, particularly those with high first costs or longer paybacks would incur a prohibitively large measure cost. Although no single program or measure must be cost effective, the portfolio must be cost effective. Thus, mandating the program administrators classify all applications of a given installation type under an existing conditions baseline may unintentionally limit portfolio offerings and/or undermine their efforts to maintain a cost-effective portfolio.

The draft measure-level baseline working group report recommends allowing the PAs to change the baseline for any measure from its default category into normal replacement. This seems prudent and provides the PAs flexibility to preserve the cost-effectiveness of the portfolio without limiting measure offerings.

1.5 Preponderance of Evidence Guidance

The preponderance of evidence guidance reflects an early consensus based decision of the working group to develop a new guidance document that would supplant the previous policy guidance document. D. 16-08-019 asks the working group to develop clear definitions on what constitutes evidence sufficient to determine whether a measure is qualified for accelerated replacement baseline treatment. This assignment does not necessitate developing a framework for processing that evidence. However, the assignment also does not preclude such an undertaking, as the framework helps to clarify the evidence and how it will be used for different program types and circumstances.

1.5.1 Proposed Preponderance of Evidence Framework

The working group interpreted the preponderance of evidence standard to imply a need to consider evidence both for and against two opposing outcomes. An illustrative excerpt from the working group guidance follows:

“Preponderance of evidence’ is a term borrowed from civil law. The preponderance of evidence standard requires that evidence for two opposing conditions be considered – in this case accelerated replacement and normal replacement baselines – and the condition more likely to be true (greater than 50% probability) be chosen.

If an implementer decides an accelerated replacement baseline is compelling for a particular measure but fails to fully investigate, document, and provide evidence to score the alternative normal replacement baseline it will be impossible to proceed with certainty that any subsequent review will uphold the implementer’s decision on baseline type because the preponderance of evidence exercise has not been completed. Strong evidence for one baseline condition alone will be at best suggestive.”

The working group rationale was that the preponderance of evidence standard in civil law means that the issue in question is “more likely than not” to be true, or that the probability it is true exceeds 50 percent. Furthermore, the working group reasoned that a preponderance of evidence could not be applied without weighing all relevant evidence, including evidence both for and against the considered outcomes. Given this framing, the working group proposes that incentive applications that use an accelerated replacement baseline treatment

offer evidence both for and against eligibility. The guidance also suggests that evidence be scored by a reviewer and the resulting scores be used to weigh the evidence. That is, the total score for evidence supporting an accelerated replacement baseline treatment is compared to the total score for evidence against using a normal replacement treatment, and the greater score will determine the appropriate baseline.

We are concerned about the potential subjectivity of the scoring, and whether it is reasonable to expect implementers to bring evidence against their self-interest to the scoring. CPUC contractors and evaluators.

Section 5 of the guidance document (*Full Site-Based Preponderance of Evidence*) presents the details of this preponderance of evidence framework. It also embodies important conceptual and implementation shifts that are supported by the working group, such as the scoring system and guidance on types and relative value of evidence. Stakeholder feedback indicates a consensus that the proposed guidance offers improved clarity and transparency in the application of the preponderance of evidence standard. We believe these accomplishments are valuable and we also find the rigor of the proposed guidance to be adequate. On balance, the benefits of the revised policy and what it offers stakeholders outweigh our concerns and so we adopt the policies set forth in Section 5 of the preponderance of evidence guidance document.

As noted in D.16-08-019, the Commission will revisit its policies on existing conditions baseline, which would include the preponderance of evidence documentation standards, to ensure that they are meeting the intent of AB802. Given that the preponderance of evidence guidance document is to be considered a “living” document that will be updated over time, this approach may be modified in the future.

1.5.2 Applicability of Preponderance of Evidence Guidance

The working group guidance defines applicability of the preponderance of evidence requirements as follows:

“This protocol applies to the following types of measures:

- 1) Custom or deemed measures in existing facilities delivered through downstream programs, or
- 2) Any non-building custom or deemed measure including industrial and agricultural.

Exceptions: Even if the measure meets the above criteria this protocol does not apply if it is:

- 3) Associated with new construction, expansion, or added load that cannot be met with existing equipment,
- 4) Delivered through an upstream program,
- 5) Implemented as part of a behavioral, retrocommissioning, or operationally oriented program,
- 6) A building shell, building system, or add-on equipment measure type, or
- 7) A program with savings estimation based on a randomized control trial or experimental method.”

We find items 1 and 2 above to be redundant with one another.

With respect to item 3, the description of added load was modified versus the language of D. 16-08-019, and the measure-level baseline guidance document. The preponderance of evidence document modifies the term to read, “added load *that cannot be met with existing equipment.*” The new clause allows measures to qualify for accelerated replacement baseline treatment where they represent or are concurrent with added load, but where added load “could have” been met with existing equipment. The purpose of this clause appears to be to allow for some added load, pushing the boundary set by the policy beyond its “existing condition” point of reference, and instead to a hypothetical point of reference. Hypothetical points of reference are always more uncertain and in many cases, are more contentious. Capacity expansions and the addition of new load mandate equipment upgrades and changes, and for these reasons we consider them a normal replacement installation type and apply a code baseline. We find the proposed modification to complicate the policy, both for purposes of verification and compliance and for these reasons we do not adopt it.

With respect to the numbered items in the list above, we note there is no mention of the expanded set of conditions for which there is no defined

existing condition that are adopted in this Resolution (See the discussion of When is the Existing Condition Undefined? On page 12)

We find items 4 and 5 to be incomplete and/or not well-defined. For all the reasons discussed in this section, we adopt the following eligibility criteria for preponderance of evidence guidance:

“This protocol applies to custom or deemed retrofit measures that are delivered through downstream programs, under conditions that meet Commission standards for a defined existing condition and do not otherwise default to an existing conditions baseline per D. 16-08-019 and Resolution E-4818.”

1.5.3 Tiered Rigor Levels for Preponderance of Evidence Requirements

The working group developed a ‘Tiered’ approach in its preponderance of evidence guidance, whereby projects with smaller incentives would be held to a lower rigor standard. The working group agreed there should be three rigor tiers:

- “Full Rigor” for the largest projects with incentives greater than \$100,000,
- “Tier 1, Medium Rigor” for projects with incentives between \$25,000 and \$100,000, and
- “Tier 2 Lower Rigor” for projects with incentives less than \$25,000.

The proposed incentive levels were based on a similar rigor distinction that applies to current measurement and verification standards.

We adopt this proposed tiered approach. We also adopt the proposed incentive size cutoffs for the tier categories. We suggest they might better apply to cumulative incentives for a given customer over a calendar year. However, this option was not considered by the working group so we do not adopt the modification.

Despite agreement on using a tiered approach and in defining them with the incentives values in the bullets above, the working group was not able to agree on what would constitute sufficient documentation standards for the lower rigor tiers (i.e. Tier 1 and Tier 2). Parties could not agree as to whether the lowest rigor tier would involve an interview conducted by an independent third party, or program administrator, or implementer. There were also differing perspectives

on whether the questionnaire should be program specific or general, whether the language in the questionnaire should indicate there would be consequences for misrepresenting facts, and even whether an interview should be conducted at all. Working group facilitators present their best approximation of a "middle ground" solution, representing no one perspective nor a negotiated compromise. We do not adopt these policies because there were such large differences in the related opinions of different stakeholder groups on these issues, and we feel the policy requires further development before it can be adopted.

To be clear, **the tiered preponderance of evidence approach is not approved for implementation.** We have no adopted policy guidance to determine what constitutes sufficient rigor for determining accelerated replacement for Tier 1 and Tier 2 projects, so the approach is not implementable currently. We adopt the definition of the tiers to provide a more defined structure within which the supporting policy can be developed and adopted by the Commission at a future time.

1.5.4 Deemed Measure Preponderance of Evidence

Section 7 of the working group's proposed guidance document allows for deemed measures to apply to an existing conditions baseline through Commission staff approval of related workpapers, program designs, and program rules. The expectation is that a compelling data supported case will be made to Commission staff by Program Administrators that indicate a program design and delivery configuration can be reasonably expected to accelerate measure adoptions in the target population. This alleviates the need to confirm program influence through the course of program implementation, though not necessarily equipment viability. We adopt the program level preponderance of evidence guidance for deemed measures, as described in Section 7 of the preponderance of evidence guidance document.

1.5.5 "Direct-to-Decision" Baseline Assignment

Section 4 of the preponderance of evidence guidance provides for "direct-to-decision" and "direct-to-default" conditions. These are conditions through which a determination of accelerated replacement may be streamlined or automatic.

The proposed "direct-to-decision" criteria are those by which a project may qualify as accelerated replacement without any further preponderance of evidence requirement.

The proposed criteria that would default a project to an accelerated replacement baseline per the working group guidance are as follows:

1. “Custom measures installed through residential and small commercial direct install programs.**
2. Tenant space build-outs where the tenant, space purpose and equipment use patterns remain the same.
3. Pre-existing equipment was functional and the measure was proposed in an implementer-provided audit through a program that the Commission has approved as being designed to expressly target early replacement.

**Where CPUC Staff must pre-approve the direct install program as being appropriate for such classification. For deemed measures with these customer classes, see the deemed section.”

Item number 1 above is relatively reasonable, as it incorporates a Commission review of program design and program rules to confirm there is a reasonable expectation of accelerated replacement, and that the program is oriented to specific underserved markets. However, the guidance does not specify requirements for verifying equipment operability or customer eligibility, both of which are necessary and prudent. We note, for example, that some measurable portion of lighting fixtures can reasonably be expected to be non-operational at almost any time in an existing commercial building.

Item number 2 is more concerning than item 1, since it would circumvent any consideration of program influence in the determination of accelerated replacement, in a manner irrespective of program design, customer size or project size. In addition, there are no stated requirements to collect specified types of evidence to demonstrate project or customer eligibility, implying this is either up to the implementer to determine or it is not required at all. In addition, there are no stated requirements to document the functionality and operability of existing equipment.

Item number 3 incorporates Commission approval of the program design. However, there are no requirements for implementers to collect evidence of equipment operability or program eligibility, and this allowance appears to apply irrespective of the customer size or project size. We find these omissions unacceptable.

We adopt the proposals represented in items 1 through 3 above only with the following conditions and modifications:

Any approach that streamlines or automates the determination of accelerated replacement baseline must comply with the following guidelines:

- Program designs, program rules and customer eligibility criteria are submitted to the Commission for approval, with a strong argument or data supported case that is highly indicative of inducing accelerated replacement.
- The program rules must specify the customer eligibility criteria and the evidence of eligibility that will be collected for each program installation.
- The specified evidence must be collected for each installation as part of the program implementation, and this evidence must be made available to the Commission upon request and submitted as supporting documentation with related energy savings claims.
- All projects qualifying for an accelerated replacement baseline under a direct-to-decision condition must fulfill appropriate tiered preponderance of evidence requirements for equipment viability.

Through this process, a program-level case can be made that program design and rules indicate a high probability of accelerated replacement, subject to approval by Commission staff. For these program designs, the project-level preponderance of evidence requirement can be limited to include evidence of customer eligibility for program participation and evidence of equipment viability. Equipment viability standards must be fulfilled on a project-specific basis, in accordance with the appropriate tier standard.

We are aware that there is not agreement across Program Administrators in how to identify and verify a small business customer. This standard would be needed to qualify programs for a direct-to-decision treatment where customer eligibility includes a small business designation. For this reason, we direct the Track 2 working group (assigned to address issues of streamlining custom ex-ante review and industry standard practice) to recommend a statewide definition of a small sized business and associated evidentiary requirements to verify this classification.

1.5.6 “Direct to Default” Baseline Assignment

The introductory text offered in the guidance document for “direct-to-default” preponderance of evidence requirements state that the condition identified is “strongly suggestive of one of three outcomes.” Based on the content of the table, the three outcomes that are possible include: normal replacement, accelerated replacement and no influence. The latter is directly related to a free ridership determination. Free ridership determinations are not within the assigned scope of the working group. In all discussions and deliberations, the working group focused on distinguishing and defining criteria with which to determine whether the appropriate measure-level baseline was: existing conditions, normal replacement or accelerated replacement. Issues related to the indicators of “no influence” have not been addressed consistently or adequately in working group discussions.

We do not object to the assertion that a payback period longer than the expected useful life of a measure is indicative of important non-energy and non-program influencing factors. However, this singular address of an important issue falls short of a comprehensive treatment of appropriate screening criteria for program influence. Further, we assert that under an assumption of rational and fully informed decision-making, any payback (before incentives) that is *shorter* than the remaining useful life of the existing equipment indicates it is economically favorable to replace the equipment without need for incentives. Thus, for cases where rational decision making applies, incentives that do not financially induce existing equipment to cross a remaining useful life payback threshold also indicate no influence.

We are familiar with the perspective of some program implementers, that customers have numerous competing high yield opportunities for capital investment and/or that business uncertainty implies a higher discount rate for future costs and benefits than those we apply in our models. However, *under no circumstance should ratepayer incentives be applied where the simple payback period is less than 12 months before incentives.* We adopt the “no influence” criteria proposed with the addition of a minimum payback period, to balance the maximum payback period proposed in the table.

The following is an excerpt from Section 4 of the guidance document, describing the meaning of “direct-to-default”:

“Direct-to-default” means that the evidence is strongly suggestive of one of the three outcomes and the burden of proof to justify another outcome is high. It is not definitive and does not guarantee an outcome but effectively reduces the rigor for additional requirements necessary to support the default baseline. This guide identifies seven such technology-program type-market combinations:

| Evidence | Default Baseline |
|--------------------------------------------------------------------------------------------|---------------------------|
| C/I energy management systems that don't fit in the “add-on” category | Accelerated Replacement |
| C/I/Ag refrigeration | |
| Public sector, including primary and secondary schools | |
| The pre-existing equipment is functional and its age is less than ½ of EUL | |
| The pre-existing equipment is broken and the repair cost exceeds ½ of the replacement cost | Normal Replacement |
| Measure associated with major alteration during tenant change-out | |
| The payback time after incentive exceeds the measure EUL | No Influence (Free Rider) |

Note that this does not include Strategic Energy Management programs

The guidance document also stipulates the following:

“If a measure meets the ‘direct to default’ criteria for accelerated replacement, a simplified protocol may be used to demonstrate that the measure is in fact accelerated replacement. See the simplified POE protocol described in Section 6. A measure that does not meet the above criteria is not certain to be the opposite of the default baseline shown. It simply means it is not ‘direct-to-default’.”

Neither the descriptions in the table nor the text above address or define what is meant by a “simplified protocol” or what standards and requirement such a protocol would warrant, or how it would be applied. Whether the intention was to reduce the rigor level by one tier than would otherwise apply, or whether the

intended meaning was to apply the lowest rigor tier to all cases, neither proposal is adopted.

The assertion that any alternative baseline determination beyond what is noted in the table cannot be made without a higher burden of proof is similarly ambiguous. It is also inconsistent with our determination –and working group recommendations - that a normal replacement baseline is always an available baseline option, without any burden of proof (see the section titled, *Prescriptive or Flexible Baseline Categorization* on page 36)

Moreover, as discussed on page 12, the measure-level baseline guidance already stipulates normal replacement treatment for alterations associated with a change in lessee, thus the inclusion of a qualifying circumstance in the table creates ambiguity for eligibility standards.

We do not find the proposed direct-to-default conditions compelling as they are proposed, but agree that there are some conditions under which a streamlined determination of accelerated replacement makes sense. We adopt a policy to allow programs to qualify for a reduced level of rigor to determine direct-to-default accelerated replacement with the following conditions and requirements:

- Direct-to-default program design and program rules must be submitted to the Commission for approval, with a strong argument or data supported case that is indicative of inducing accelerated replacement.
- The program rules must specify the evidence of program influence and customer eligibility that will be collected for each program installation.
- The specified evidence must be collected for each installation as part of the program implementation, and this evidence must be made available to the Commission upon request and submitted as supporting documentation with related energy savings claims.
- All projects qualifying for an accelerated replacement baseline under a direct-to-default condition must fulfill the appropriate tiered preponderance of evidence requirements for equipment viability.

1.6 Default Measure Level Baseline Assignment Table

The draft measure level baseline guidance document recommends several changes to Table 1 of D. 16-08-019.

The first recommended change from the working group is to create separate columns for add-on equipment and shell and building system measures. The rationale for this is that the two installation types are distinct and should be subject to different policy guidance. At the same time, the group did not recommend different entries in the table for add-on equipment versus shell and building system. We see no reason that these cannot retain separate definitions and distinct policy guidance, while also being represented in the same column of the Table, given they are to receive the same baseline treatment.

The second recommended change is to expand the non-building measures row to essentially duplicate the existing buildings including major alterations rows, with one minor difference- that the entries under the shell and building system column read "N/A" instead of existing. This proposed change is clearly not appropriate. If it were, there would be no reason to separate building and non-building projects, as they are treated identically with respect to baseline except where undefined ("N/A"). However, building projects are substantively different from non-building projects. They are treated differently in D. 16-08-019, and have a different relationship to AB802 legislation.

Baseline policy for non-building alterations is in development per the discussion in Section 3 of D. 16-08-019. This discussion indicates that treatment of baseline for non-building projects is to remain unchanged pending the development of applicable NMEC savings determinations for measures that improve efficiency in non-building applications. It appears that the inclusion of the non-building sector in Table 1, together with references to ongoing development of emerging NMEC applications may have created unintended confusion.

The third recommended change to Table 1 made by the working group is in regards to major alterations. The group recommended breaking this out as a sub-row within existing buildings, and allowing all applicable measures to be classified as either code or dual baseline. However, these new entries, as proposed do not specify the baseline treatment, but instead they offer a set of alternative treatments for each installation type. This ambiguity is inconsistent with the remainder of Table 1 and undermines the value and utility, so we are reticent to adopt it as is.

Consistent with our efforts to retain simplicity and reflect current policy in a succinct format, we provide a supplemental table, presented below.

Table 1.1 Measure Level Baseline Guidance

| Alteration Type | Delivery | Savings Determination | Customer Class | Installation Type | |
|-----------------------------------------------------------------------|--------------------------|------------------------|----------------|-------------------------------|---------------------------------------------------|
| | | | | Weatherization / Add On / BRO | Efficient Equipment (ER/NR) |
| No Existing Condition | All | | | Code | |
| Existing Buildings | Upstream/midstream | All | | Code | |
| | Downstream | NMEC, RCT, exp. design | | Existing | |
| | | Calculated | | Existing | Direct-to-Decision/ Direct-to-Default POE** |
| | | Deemed | | Existing | Deemed POE |
| Non-Building projects including industrial and agricultural processes | SEM* programs | NMEC | All | Existing | |
| | Other (not-SEM) programs | All | | Existing | Direct-to-Decision/ Direct-to-Default POE** |

*Strategic Energy Management programs are currently under development in a collaborative effort of Commission staff and Program Administrators.

**"Incentive Tiered POE" will apply here only following Commission approval of Tier 1 and Tier 2 preponderance of evidence requirements. These requirements are not adopted in this Resolution but assigned to the Track 2 Working Group, per ordering paragraph 25.

1.7 Measure Level List

The working group developed a measure level list, but some working group members are concerned that the measure descriptions are too broad in some cases. Also, we do not adopt the working group recommendation to classify lighting as eligible for existing conditions baseline for all downstream program types. For these reasons, we cannot adopt the measure level list.

COMMENTS

Public Utilities Code section 311(g)(1) provides that this resolution must be served on all parties and subject to at least 30-days public review and comment prior to a vote of the Commission. Section 311(g)(2) provides that this 30-day

period may be reduced or waived upon the stipulation of all parties in the proceeding.

The 30-day comment period for the draft of this resolution was neither waived nor reduced. Accordingly, this draft resolution was mailed to parties for comments, and will be placed on the Commission's agenda no earlier than 30 days from today.

FINDINGS

1. The recommendations of the working group to vary in merit and cohesiveness.
2. There are gaps in the proposals of the working group's guidance documents.
3. In some cases, the working group proposals call for adopting additional clarifying policy guidance.
4. The application of existing conditions baseline to determine savings for capital projects using a deemed or calculated savings determination has the potential to confound savings resulting from deferred maintenance and repair with those of the capital improvement they intend to represent.
5. The broad application of existing conditions baseline demands clear distinctions between repairs that are eligible for ratepayer funded energy efficiency programs and those that are not.
6. There are additional circumstances beyond those identified in D. 16-08-019 where there is no reference operation for an existing condition baseline, and therefore the existing condition is undefined and does not apply.
7. There are no feasible cost effectiveness policies to support accelerated replacement eligibility for equipment that is non-operational or does not meet the existing service requirements. Non-operational equipment and equipment that does not meet the existing service requirements are to be treated as normal replacement.
8. Code baseline and industry standard practice baselines both reflect the efficiency of equipment that would have been adopted with the program activities and influence. We do not have a clear policy regarding how to apply these alternative normal replacement baselines in cases where both apply, or how to develop baseline when neither are applicable.

9. We agree with PG&E and other members of the working group that establishing clarity on the application of code baseline was not within the assigned scope of the working group.
10. Mandating the use of existing conditions baseline for all applications of a given installation type may unintentionally limit portfolio offerings and/or undermine Program Administrators efforts to maintain a cost-effective portfolio
11. The definition of downstream programs relates directly to the applicability of existing conditions baseline, and there is no clear and strong definition within the body of current adopted policy.
12. The text presented page 26 of this Resolution, (in the section titled *Repairs, Optimization, and Replacement of Existing Add-On Equipment*) offers guidance for the distinction between repairs that are eligible for ratepayer funded energy efficiency programs and those that are not. This text was not discussed in the working group.
13. The working group's proposed definition of add-on equipment allows for independently functioning equipment to qualify as add-on equipment, where previously this was disallowed. If it were adopted, this would represent a potentially significant change in policy and warrants careful consideration. In addition, such a policy change is not clearly within the assigned scope of the working group.
14. Shell and building system measures evolved into two classifications during working group deliberations: building weatherization measures and lighting measures.
15. It is not reasonable that lighting systems represent the only mechanical system that should qualify as shell and building system, given their reasonable turnover rate and code compliance for many building types.
16. It is reasonable to define the accelerated replacement installation type as three sub-categories: early replacement, repair eligible, and repair indefinitely.
17. For purposes of dual baseline calculation, there is no reasonably reliable and cost effective method to assess the expected useful life or total costs of repairs that would have been necessary to sustain operability of removed equipment over the expected useful life of new equipment.

18. Equipment that is older than its effective useful life may qualify for an accelerated replacement baseline treatment where it is determined the equipment is either repair eligible or repair indefinitely.
19. We do not have a process or evidence requirements for how equipment could be qualified as repair indefinitely. The working group also did not assign any measures to this category.
20. The language of AB802 legislation implies energy efficiency programs recognize energy savings from measures that bring existing building into compliance with building code and not necessarily exceed code.
21. The proposed guidance for applying a preponderance of evidence standard relies on implementers to present evidence against their own interests. We share the concern of other stakeholders that this is not a prudent or preferred framework. In the absence of an alternative framework, however, we accept this proposal and will revisit its effectiveness in the future.
22. It is reasonable to use a tiered approach to the preponderance of evidence, where three rigor levels (“Full Rigor”, “Tier 1, Medium Rigor” and “Tier 2, Lower Rigor”) are applied as a function of customer incentive size.
23. The working group recommends the tiers correspond to the following incentive ranges specifically: “Full Rigor” for incentives over \$100,000, “Tier 1 Medium Rigor” for incentives between \$25,000 and \$100,000, and “Tier 2 Lower Rigor” for incentives less than \$25,000. These are generally consistent with project size guidelines that determine the level of rigor for required project measurement and verification.
24. The criteria proposed in the working group guidance for determining applicability of the preponderance of evidence standards are insufficient for the intended purpose.
25. It is the intention of AB802 and D. 16-08-019 to allow a greater portion of the portfolio to default to an existing conditions baseline. We find that most mechanical systems in buildings were more appropriate for consideration in an accelerated replacement framework which uses existing conditions as part of a dual baseline. Thus, processes that streamline or automate the use of dual baseline are important to implementing these policies and considering the savings of energy efficiency measures using an existing conditions baseline.
26. Section 4 of the preponderance of evidence guidance is overly expansive in assigning streamlined or default accelerated replacement baseline treatment,

as they are proposed in the “direct-to-decision” and “direct-to-default” sections of the working group guidance.

27. A payback period longer than the expected useful life of a measure is indicative of important non-energy and non-program influencing factors. A short payback period (before incentives) is an important indicator of the influence offered by financial incentives.
28. There is not a consensus across Program Administrators in how to identify and verify a small business customer. Such a standard is needed to design and implement any ‘direct-to-decision’ treatment (per as outlined in this resolution, where the customer eligibility includes a small business designation).
29. Working group members did not agree to specific criteria defining the preponderance of evidence requirements for the lower rigor tiers (Tier 1 and Tier 2). Section 6 of the working group guidance document is a proposal authored by working group facilitators that reflects a middle ground and not a common ground and does not reflect a working group recommendation.

THEREFORE IT IS ORDERED THAT:

1. For deemed and calculated savings determinations, we direct the Program Administrators to ensure that the nominal efficiency used as an existing conditions baseline will reflect the efficiency rating, designed efficiency, or original efficiency of well-maintained and properly configured efficiency for all measures, except those classified as behavioral, retrocommissioning and operational. If nominal efficiency is not available, Program Administrators shall ensure that a degradation factor or reasonable estimation method is used to separate and subtract the maintenance and repair savings from the measure savings.
2. We direct the Program Administrators to ensure that all program activities and installations resulting in performance that does not exceed the nominal efficiency (i.e., rated, intended, or original efficiency) of the pre-existing condition are offered through a behavioral, retrocommissioning or operational program framework, with an effective useful life not to exceed three years.
3. We adopt the text presented page 26 of this Resolution, (in the section titled *Repairs, Optimization, and Replacement of Existing Add-On Equipment*) as

guidance for the distinction between repairs that are eligible for ratepayer funded energy efficiency programs and those that are not.

4. 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 (e.g., 30% or more) in design occupancy.
5. We direct the Program Administrators to apply a normal replacement baseline where the existing equipment is not operational or not meeting the existing service requirements.
6. We do not adopt the draft policy concerning the application of a code baseline that is presented in the measure-level baseline guidance document at this time.
7. We permit the Program Administrators to apply a normal replacement baseline to any measure or program, regardless of the default category, and without a burden of proof.
8. We direct Program Administrators to classify programs as downstream in their program delivery only when they are delivered by program agents or representatives (including installation contractors) that have direct interaction with end-use customers.
9. For all downstream programs, we direct the Program Administrators to maintain site-specific records for program activities and installations resulting in energy savings. These records must include utility account number, installation site address, and evidence required by the applicable preponderance of evidence standard. In some cases, preponderance of evidence standards will consist of evidence of program eligibility.
10. We direct the Program Administrators to ensure all methods for determining savings, regardless of whether deemed or custom, use a congruent approach when characterizing the pre- and post-project conditions - e.g., the efficiency rating of pre-existing equipment is compared with the efficiency rating of installed equipment, or the metered performance of the pre-existing equipment is compared with the metered performance of the installed equipment.

11. We adopt the definition of “Add-on Equipment”, as presented in Section 2.2.5 of the preceding preponderance of evidence guidance document.¹⁰
12. The default measure-level baseline that is applicable to downstream program delivery and deemed or calculated savings determinations shall be existing conditions for the following measure installation types: behavioral, retrocommissioning, and operational; building weatherization / insulation measures (e.g., air sealing, duct sealing, insulation, windows/ doors); and add-on equipment measures.
13. We direct the use of the term ‘building weatherization’ instead of ‘shell and building system,’ because it more closely adheres to the underlying measures as defined in working group discussions.
14. We direct the Program Administrators to classify lighting along with other mechanical systems and given baseline treatment of either normal replacement or accelerated replacement subject to a preponderance of evidence.
15. We adopt the working group proposal that accelerated replacement is comprised of three sub-categories: early replacement, repair eligible, and repair indefinitely, and direct the Program Administrators to apply administrative policies consistent with this structure.
16. We direct Program Administrators to ensure that whenever a deemed or calculated savings determination is applied to an accelerated replacement measure, regardless of the accelerated replacement sub-category, the dual baseline calculation savings will be applied per the current standard reflected in the Energy Efficiency Policy Manual. Dual baseline treatment will not vary by accelerated replacement sub-category.
17. We permit the Program Administrators to apply an accelerated replacement baseline treatment to equipment that qualifies as repair eligible or repair indefinitely where the equipment is older than its predetermined effective useful life.

¹⁰ “Early Retirement Using Preponderance of Evidence”
<http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=5325>. The adopted text can also be found on page 24 of this Resolution.

18. We adopt the following eligibility criteria for the preponderance of evidence guidance: “This protocol applies to custom or deemed retrofit measures that are delivered through downstream programs, under conditions that meet Commission standards for a defined existing condition and do not otherwise default to an existing conditions baseline per policy of D. 16-08-019 and Resolution E-4818.”
19. We adopt a program eligibility criteria that disallows measures for which the payback is longer than the effective useful life, and where the simple payback period is less than 12 months before the application of incentives.
20. We direct the Program Administrators to adhere to the direct-to-decision and direct-to-default standards as stipulated in the corresponding sections of this Resolution, and summarized below:
 - Program designs, program rules and customer eligibility criteria are submitted to the Commission for approval, with a strong argument or data supported case indicative of inducing accelerated replacement.
 - Program rules must specify eligibility criteria and the evidence of program eligibility and/or program influence that will be collected for each installation.
 - Specified evidence must be collected for each installation as part of the program implementation, and this evidence be made available to the Commission upon request and submitted as supporting documentation with energy savings claims.
 - All projects qualifying for an accelerated replacement baseline under a direct-to-decision or direct-to-default condition must fulfill appropriate tiered preponderance of evidence requirements for equipment viability.
21. We adopt Section 5 of the working group’s preponderance of evidence guidance, with reservation.
22. We adopt the program-level preponderance of evidence guidance for deemed measures as described in Section 7 of the working group guidance document. We direct the Program Administrators to substantiate claims of accelerated replacements for deemed measures accordingly, on a program-specific basis and subject to Commission approval, per the requirements specified in Section 7.
23. We adopt a tiered approach to the preponderance of evidence, with three tier levels corresponding to the rigor of the assessment: Full Rigor for projects

with incentives over \$100,000; Tier 1 Medium Rigor for projects with incentives between \$25,000 and \$100,000, and Tier 2 Lower Rigor for projects with incentives less than \$25,000.

24. We do not adopt the specific preponderance of evidence requirements for Tier 1 and Tier 2, as outlined in Section 6 of the working group guidance. For this reason, we prohibit the use of a tiered approach to the preponderance of evidence requirements until specific requirements for the tiers are adopted.

25. In response to working group proposals we are not adopting today, we defer several issues to be addressed within the planned activities of upcoming Track 2 working group, ordered by D 16-08-019 to resolve issues related to the streamlining of ex-ante review processes and industry standard practice baseline. We ask the Track 2 working group to address the following in their deliberations and recommendations, and that recommendations be presented to Commission staff no later than June 30, 2017:

- Consider and recommend clarifying policy for how to determine code baseline as they address issues related to industry standard practice.
- Develop qualification standards and documentation requirements to identify a small-sized business customer.
- Develop qualification standards and documentation requirements to identify repair eligible and repair indefinitely measure types.
- Develop consensus recommendations for what should constitute Tier 1 and Tier 2 Preponderance of Evidence requirements.

Commission staff will review the recommendations and update the guidance documents, as appropriate. The update will be vetted through a public process and the final document will be posted to a publicly available website.

26. Commission staff shall make any necessary updates to the DEER savings estimates to reflect the baseline policy summarized in this Resolution.

27. Program administrators shall make any necessary updates to non-DEER workpapers to reflect the baseline policy summarized in this Resolution.

This Resolution is effective today.

I certify that the foregoing resolution was duly introduced, passed and adopted at a conference of the Public Utilities Commission of the State of California held on February 9, 2017; the following Commissioners voting favorably thereon:

TIMOTHY J. SULLIVAN
Executive Director