2016 Ex-Ante Savings and 2015 Ex-Post Adjustment Statement

**A. Adjustments to 2016 Ex-Ante Savings Data**

This Attachment to Resolution E-4897 makes the following adjustments, which are detailed in the “2016 Final Ex-Ante Workbook”[[1]](#footnote-1), to the 2016 Ex-Ante energy savings values used to verify the 2016 ESPI ex-ante savings awards:

1. Use of the quarterly reported claims data to calculate deemed ESPI savings in place of savings accomplishments provided in the IOUs’ advice letters,
2. Proper application of Early Retirement (ER) policy and related effective and remaining useful life (EUL and RUL) values for, ER, retrofit add-on (REA) measures and measures with savings calculated over existing baselines,
3. Proper application of net-to-gross (NTG) values,
4. Application of DEER EUL for screw-in compact fluorescent lamps (CFLs),
5. Revisions to SCE ER claims for commercial package HVAC equipment to reflect available evidence based on review of current and historical claims by all IOUs
6. 2016 claims with installations prior to 2016
7. Proper application of Commission direction for schools that allows only measures that exceed code to be claimed.
8. **Use of Quarterly Reported Claims Stored on the Energy Division’s Central Server Database**

Where reconciliation could not be made between the data submitted via the PAs’ ESPI Advice Letters and the PAs’ official quarterly claims data reported to the Commission, Commission staff used the official reported claims data as the basis for calculating the deemed measure payments. Staff notes that accomplishment’s reported in advice letters agree closely, with some minor exceptions, with those in the IOU reported official claims for all utilities except SCE. SCE did not include all accomplishments in their Advice Letter as directed.The supporting workbook that SCE provided with their advice letter only included claims for which they were requesting payment as deemed not uncertain rather than all claims submitted for 2016 (including custom, deemed not uncertain and deemed uncertain).

1. **Adjustment for Early Retirement, Retrofit Add-on and Other Measures with Savings Calculated Over Existing Baselines (PGE, SCE, SDGE)**

The measure application type reported for a measure, its EUL and RUL along with the savings (first and second period) must all be consistent. Staff revised claims with inconsistent or incorrect assignments in the following categories:

* **Use of high RUL or EUL for add-on measures:** The EUL of measures that add new technologies to existing equipment or systems is typically limited by the RUL of the existing equipment. These measures are commonly referred to as “Retrofit Add-on” or “REA” measures. Examples of REA measures are the addition of an air economizer onto an air conditioning system or the installation of night covers on open refrigerated cases. Staff has revised these measures so that the EUL of the measure is equal to the lower of the RUL of modified system or equipment and the EUL of the new component. The RUL has been revised in all cases to be zero.
* **Measures misclassified as add-on measures:** Some measures appear to be classified as REA, but are defined as a replacement of specific component of an existing operating system or piece of equipment with a more efficient component. Examples of these types of measures are replacement of linear fluorescent lighting in refrigerated cases with LEDs and the replacement of wall switches for lighting with wall-box occupancy sensors. Since the existing equipment cannot operate without the replaced component, these measures should have been classified as Early Retirement (ER) rather than REA. For these measures, the RUL has been revised to be the lower of the RUL of modified system or equipment and the EUL of the new component, and the EUL has been set equal to the RUL.
* **Measures misclassified as Replace-on-Burnout measures:** Any measure with savings calculated above a pre-existing condition implies an early retirement application. Where the measure is a replacement of a component of an existing system or piece of equipment, the EUL of the measure must be the lower of the RUL of modified system or equipment and the EUL of the new component. Staff has revised these measures to reflect this requirement. These measures are likely misclassified as ROB and should be classified as ER where the RUL is set to follow this requirement and the EUL is set equal to the RUL.
* **Early retirement measures with incorrect RUL values:** The DEER 2011 update revised the RUL for early retirement lighting measures where the pre-existing technology included 4-foot, 8-foot or U-tube T12 lamps. For these measures, DEER requires the RUL be calculated based on the EUL of the pre-existing lamp (instead of the ballast as is the case for all other linear fluorescent measures). Staff reviewed and revised as needed the RULs for all early retirement lighting measures with T12 pre-existing technologies to be consistent with DEER requirements.
1. **Net-to-Gross Revisions**

Commission staff classifies the erroneous and inappropriate assignments of NTG into the categories described below.

* **Use of Emerging Technology default Net-to-Gross (SCE):** Some LED measures are still being claimed with the Emerging Technology default NTG value of 0.85. There are other measures that have been in portfolios for several years that are also claimed with this value. As directed in D.12-05-015, program administrators must propose and request approval from staff for the use of the emerging technology default. Additionally, D.12-05-015 requires that, in order for the emerging technology default to be used, the measure inclusion into the portfolio must be directly attributable to the emerging technology program activity. Simply including the emerging technology NTG designation in a workpaper or other document, with no documentation to support the emerging technology program influence claim, is not sufficient. ET NTGs were claimed inconsistently across PAs for the same measures. If only one PA claimed the ET NTG, staff revised that PA’s NTG to the standard DEER NTG. Also, if the ET study that introduced the measure was older than 2010, NTG was revised to the standard DEER NTG.
* **Use of constrained area program Net-to-Gross (PGE):** The stated intent of the direction in Decision 14-10-046 in providing an elevated NTG value is to encourage PAs to develop and implement program enhancements that specifically target customers in constrained areas.[[2]](#footnote-2) By increasing efforts through targeting, the Commission expected increased participation and uptake, thus supporting a higher NTG of 0.85 rather than the otherwise applicable DEER value. Through its review of claims and PA program activities, Commission staff did not find evidence of significant targeting or evidence of significant enhanced uptake in constrained areas. One example of targeting is to provide increased incentives or rebates to drive increased participation. To this end D.14-10-046 required that incentives or rebates for measures delivered via targeting to these constrained areas be “the higher of 75% of incremental measure cost, or what is available under prior policies.” Commission staff compared the use of incentive “kicker” to enhance uptake and found less than 4% of incentive kickers were used within constrained areas by PG&E. Based on this evidence, the use of kickers does not appear to have been a targeting strategy for constrained areas but rather a general approach to program delivery. Commission staff also compared incentive claims for identical measures across constrained and non-constrained areas. For the most part, staff observed very little difference in these incentives. For measures in constrained areas with incentives at least 5% greater than incentives for identical measures in non-strained areas, staff accepted the 0.85 NTG value ordered in D.14-10-046. For all other measures, Commission staff revised the claimed values to the standard DEER NTG values.
* Unsupported High NTG Claims: The EDCS database includes a field that allows identification of NTG values that are larger than the standard DEER values, such as for schools, hard-to-reach, or ET measures. Many claims were submitted using an NTG value of 0.85 for measures where the standard DEER value was lower, but with no information provided in this NTG ID field. PAs are required to provide supporting documentation for high NTG values. In some cases, the submitted values appeared to be reporting errors where the PAs reported out-of-date DEER NTG values. Examples are using 0.85 for upstream package HVAC (updated to 0.75 for 2016) and Home Upgrade (updated to 0.7 in 2016), but Commission staff could not reasonably determine any reason for many of the other claims. Commission staff revised all of these unsupported NTG values to the standard DEER values.
* Reporting Errors: In some cases, it appears that out-of-date NTG values were reported. Some measures included high NTG values. Examples are using 0.85 for upstream package HVAC (updated to 0.75 for 2016) and Home Upgrade (updated to 0.7 in 2016). In other cases the values were low. Examples are CFL measures (updated to 0.9 in 2016) and refrigerator recycling (updated to 0.8 in 2016) . Commission staff revised all of these unsupported NTG values to the current DEER values.
1. **DEER EUL for Screw-in Compact Fluorescent Lamps (PGE, SDGE)**

The DEER EUL for all interior and exterior residential CFLs is 3.5 years. Some claims were submitted with higher EUL values. Commission staff revised these to the current value of 3.5.

1. **Package HVAC Early Retirement Claims (SCE)**

Commission staff reviewed the details of the SCE savings claims for its commercial HVAC ER program. Those claims were adjusted to be in conformance with the previous CPUC direction as well as staff direction to SCE staff regarding the requirements on the claims for that specific program. Commission direction regarding requirements for ER claims clearly place a burden on SCE to only submit such claims after an examination of evidence supporting or refuting such claims[[3]](#footnote-3).

Adjustments were made to the SCE commercial HVAC ER program claims to remove a percentage that do not meet the preponderance of evidence standard that the program induced the early retirement rather than just caused an efficiency increase for a replacement that would happen independent of the program. The adjustment was made following the same procedure and approach adopted in Resolution E-4807[[4]](#footnote-4). Staff adjusted the early retirement portion of SCE’s commercial HVAC claims by applying a gross savings adjustment of 0.25, to reflect that the majority of SCE early retirement claims were in actuality normal replacement installations. This change reduces early retirement claims and associated savings by 75%.

1. **2016 claims with installations prior to 2016 (SCE, SCG)**

Previous Commission direction required PAs to only include savings for measures installed in the same year for which they are claiming incentives.[[5]](#footnote-5) The 2016 ESPI Advice Letter guidance document directed IOUs to submit a supplemental table of claims for measures installed prior to 2016 for which an exception to the installation date policy was being requested along with a justification for the requested exceptions. Both SCE and SCG requested that the Commission allow counting pre-2016 installations for some specific justifications. Both requested that projects that were jointly paying customer incentives, SCE for electric savings and SCG for gas savings, be allowed as it takes as much as one to two quarters for the exchange of information on these projects between the utilities. Commission will allow this exception for this year but only for projects installed in 2015 and not those installed earlier than 2015. The utilities should improve their tracking and information exchange procedures between now and when 2017 claims are finalized in mid-2018 so that these “partnered” projects are correctly reported for 2017 and beyond. None of the other requested exceptions were found to be reasonable and are thus denied.

1. **Proper application of Commission direction for schools that allows only measures that exceed code to be claimed**

All K-12 schools and community college measures and projects (school projects) are to be specifically identified in the claims and additio9nally, those projects having California Proposition 39 (Prop 39) funding support should also be specifically identified in claims. Some school projects are identified as accelerated replacement; IOUs are allowed to claim school projects as accelerated replacement, including any savings from the pre-existing equipment to the minimum code requirements, if the project meets the Commission policy requirements including a preponderance of evidence that the IOU program caused the acceleration. Staff points out that it is not reasonable to assume that an IOU’s program influenced the accelerated replacement if the project received most of its support from Prop 39 funds and the amount of that funding greatly exceeded the IOU’s provided incentive. Additionally, schools projects, to be eligible for IOU incentives, must exceed code requirements.[[6]](#footnote-6) At this time we have not made any adjustment to these claims; however we require that going forward IOUs review any proposed early retirement claims for schools projects to identify projects with predominant Prop 39 funding and remove the to-code savings from those claims and report those projects as normal replacement rather than accelerated.

**B. Adjustments to Ex-Post Savings Data (Custom and Uncertain Deemed Claims)**

This Attachment to Resolution E-4897 makes the following adjustments, which are detailed in the “2015 Final Ex-Ante Ex-Post Savings Workbook”[[7]](#footnote-7), to energy savings values used to verify the ESPI ex-post savings awards:

1. Application of DEER EUL for screw-in compact fluorescent lamps (CFLs),
2. Application of Workpaper Disposition directed EUL and UES values for screw-in LEDs,
3. T12 Early retirement and de-lamping measures with incorrect RUL values.
4. **DEER EUL for Screw-in Compact Fluorescent Lamps (PGE, SCE, SDGE)**

DEER requires a 0.523 degradation multiplier on the listed EUL of 9.67 years for residential interior CFLs. All, or nearly all, of the 2-13, 2014 and 2015 PA’s reported claims for residential interior CFLs were submitted with an EUL of 9.67 without consideration for the required degradation multiplier. Commission staff reviewed and revised all EULs for residential interior CFLs to meet the DEER EUL requirements in the same manner as was done in Resolution E-4807 for the 2015 ex-ante deemed measure claims. Multiplying the claimed EUL by the required degradation multiplier results in an EUL of 5.06 consistent with the DEER adopted methodology.[[8]](#footnote-8) Commission staff updated the reported EUL to be equal to the product of the reported EUL year value and the adopted DEER degradation multiplier.

1. **Use of Workpaper Disposition Directed EUL for LED Lamps and Fixtures (PGE, SCE, SDGE)**

The ex-post evaluations altered the utility reported ex-ante values for non- residential LED lighting EUL and UES. The EUL values assigned by the ex-post evaluations were developed from manufacturer’s reported test values listed in their product technical specifications. However, the manufacture test values are based on extrapolations from only 6,000 hours of testing and are inappropriate to use to change the previously directed 15,000 to 25,000 hours to as much as 45,000 to 50,000 hours. We did not observe any field data, laboratory testing, or any other work to verify the accuracy of the manufacturers’ estimates nor did we identify any considerations of other reasons for early failure or removal commonly experienced in the field for that adjustment. Therefore, the values are changed back to those previously directed by the Commission. Commission staff also found an incorrect update of the delta wattage for residential LED lamps which resulted in inappropriate assumed baseline versus measure wattage that would not support the requirement for equivalent service between the pre-existing and newly installed lamp. Therefore, the values are reverted back to those previously directed by the Commission as found in the utility submitted ex-ante values. Each adjustment (nonresidential EUL and lamp delta watts) is addressed in more detail below:

* **Non-residential EUL Revisions:** Commission staff issued its first disposition covering integral LED lamps on May 18, 2012[[9]](#footnote-9). This disposition included direction that the EUL shall be based on either 15,000 or 20,000 lifetime operating hours divided by the DEER annual operating hours for the building type of the installation with an upper limit of on the EUL of 12 years, the latter being the EUL of a typical target fixture type. Strict application of existing policy would limit the life of a replacement component to the RUL, or 1/3 of the EUL, of the underlying equipment which in this case is the fixture. However, the use of a standard practice baseline for the replacement allows the use of the EUL rather than RUL of the fixture as a limit. Commission staff emphasizes that, whether the EUL is limited by the operating hours or fixture life, either allows savings for many years and assumes that during that time, the current standard practice which includes a fraction of incandescent and CFL lamps. This is a generous assumption given the rapidly increasing market share of non-program LED lamps as well as code changes that eliminate some choices, especially incandescent lamps for which the already adopted code would preclude in many situations within the next year.

At the time of the 2012 LED disposition, PAs’ originally proposed EUL values were based on manufacturers’ reported lamp life hours for Energy Star rated lamps ranging from 25,000 to 50,000. Commission staff noted that testing methods used to estimate lamp life only test lamps for 6,000 hours of continuous operation. The degradation of lamp output is measured during this test, then mathematically projected to determine the life of the lamp. A lamp is considered to be at the end of its useful life when its output is 70% of its initial output. Additionally, test methods do not take into account the effects of the fixture type, installation position, the effects of on/off cycling on lamp life or the early removal of lamps for other reasons. Recent testing of LEDs using a longer testing duration, varying on/off cycling, lamp position and fixture type indicates the lamp life extrapolation method is not reliable generally[[10]](#footnote-10) which supports the limits directed in the earlier Commission staff disposition. Additionally, the early removal or replacement of installed lamps for other reason will further reduce the lamp EUL from values established from lab testing.

The 2015 nonresidential ESPI lighting report[[11]](#footnote-11) revised EUL values using a weighted average of manufacturers’ reported lamp life for the actual lamps included in the PAs’ programs during 2015, resulting in a lamp life of about 25,000 and 26,000 hours for A-lamps and reflectors, respectively, or between 25% and 66% higher lamp life than directed by the 2012 disposition. However, no additional analysis or investigation was performed to examine the effects of actual operating conditions on lamp life to establish actual lamp persistence as required by evaluation protocols, nor did the work consider the discussion in the Commission staff disposition or the recent LED lab testing results.

The 2015 Uncertain Measures List does not include measure life as an uncertain parameter for these measures. Furthermore, the equivalent residential upstream and downstream evaluation (DNVGL Report)[[12]](#footnote-12) did not revise EULs for LED lamps and kept the previously approved EUL values in estimating savings. With no additional investigation beyond what the PAs had proposed in 2012 (which was replaced with the Commission staff directed values), Commission staff chose to revise savings for nonresidential LEDs to use the approved ex ante EUL values, removing the increase in lifetime gross savings due to the increase in EUL included in the deemed lighting evaluation.

* **Revisions to LED Wattage Reductions:** During the development of the 2017 Phase 1 disposition for LED lamps[[13]](#footnote-13), PAs requested that the final disposition include a discussion of why Commission staff did not consider the 2015 evaluation results in the development of the approved savings values for LED A- and reflector lamps.

Commission staff review of the assumed baseline wattages indicated much higher lumen output for the assumed baseline than for the measure lamps. For example, Table 30 of the evaluation Report lists a baseline incandescent wattage for PG&E of 57 watts and a halogen wattage of 63 watts. Assuming that nearly all installed incandescent lamps are EISA compliant, these assumed baseline wattages correspond to EISA compliant lamps in either the 75 watt or 100 watt EISA bin with minimum output of 1,050 lumens (for the 75 watt bin) or 1,490 lumens (for the 100 watt bin). However, PG&E’s average reported A-lamp measure wattage is 8 watts (see Figure 3). The maximum output of 8 watt lamps from the Energy Star qualified product listing (QPL) is 810 lumens. Baseline and measure assumptions for SCE create an even greater disparity of performance. Table 30 of the 2015 Lighting Report shows a baseline incandescent wattage of 58 watts and a halogen wattage of 84 watts. However, the reported average measure wattage is 5 watts. The maximum output of 5 watt lamps from the QPL is 500 lumens, or no more than half the output of the assumed baseline halogen or incandescent lamp.

This inconsistency between the base and measure lamp output delta watts being about 1.5 times what should be used. Add to this the lack of an appropriate baseline composition that includes CFLs and/or LED, the overall over-estimate of delta watts can be more 3 times the typical expected value.

1. **T12 Early retirement and de-lamping measures with incorrect RUL values (PGE, SCE, SDGE)**

The 2015 uncertain measure list[[14]](#footnote-14) includes “De-lamping of T12 lamps in existing fixtures” measures, where lamps are removed from existing fixtures and the fixtures are modified in a way that they can no longer operate with more than the de-lamped number of lamps. The 2015 evaluation team mistakenly identified as de-lamping measures, early retirement of T12 lamp and ballast combinations replaced with T8 lamps and ballasts where the post retrofit T8 lamp count is smaller than the pre-existing fixture T12 lamp count. These measures were identified in the claims with the word “de-lamping” in the measure name.

Since these measures are lamp and ballast retrofits, not de-lamping measures, they are not on the uncertain measure list, are not subject to ex post savings determinations, are covered by DEER requirements, and thus were revised to be consistent with regulatory direction. DEER 2011 update revised the RUL for early retirement lighting measures where the pre-existing technology included 4-foot, 8-foot or U-tube T12 lamps. For these measures, DEER requires the RUL be calculated based on the EUL of the pre-existing lamp (instead of the ballast as is the case for all other linear fluorescent measures). For T12 lamps the DEER rated life is 20,000 hours. Therefore, the RUL can be no greater than one-third of 20,000 hours divided by the annual operating hours. For most DEER building types, this results in an RUL of between two and two-and-a-half years. Ex post results show that all of these measures were assigned an RUL of approximately five years. Commission staff reviewed and revised as needed the RULs and second period savings for all early retirement lighting measures with T12 pre-existing technologies to be consistent with DEER requirements.

1. See link for “2016 Final Ex-Ante Workbook – Savings” available from the CPUC’s Energy Efficiency Shareholder Incentive Mechanism web page, http://www.cpuc.ca.gov/General.aspx?id=4137 [↑](#footnote-ref-1)
2. Decision 14-10-046 Ordering Paragraph 9 provides “for programs targeting specific transmission, distribution, or generation constrained areas” that “For purposes of determining net savings, default ex ante lockdown rules apply, except that a Net-to-Gross ratio of .85 (before spillover effects) is ‘locked down’ for all projects.” while also requiring for those programs that “The only eligible measures are those that are above code.” and “Customer incentives shall be the higher of 75% of incremental measure cost, or what is available under prior policies.” [↑](#footnote-ref-2)
3. D.12-05-015 at 346 [↑](#footnote-ref-3)
4. Resolution E-4807, see Attachment “2015 Ex-Ante Savinging Adjustment Statement” item 5 (Package HVAC Early Retirement Claims) and the supporting workbook with the details of the calculation. [↑](#footnote-ref-4)
5. The annual installation date based claims requirement was introduced in D.04-09-060 (at 33 and Findings of Facts 14), clarified and reiterated in D.05-04-051 (at 55, Findings of Fact 36-42, Conclusion of Law 3, Ordering Paragraph 17), D.05-09-043 (at 84) and again in Resolution G-3510 (at 13) and Resolution 4807 (OP.10). [↑](#footnote-ref-5)
6. Decision 14-10-046 OP.9 states “For all projects undertaken by schools” that “The only eligible measures are those that are above code.” [↑](#footnote-ref-6)
7. See link for “• 2015 Final Ex-Ante Ex-Post Savings Workbook” available from the Commission’s Energy Efficiency Shareholder Incentive Mechanism web page, http://www.cpuc.ca.gov/General.aspx?id=4137 [↑](#footnote-ref-7)
8. The DEER2008 EUL update included a “switching degradation factor” of 0.523 for indoor residential screw-in CFLs. Explicit calculations of EULs for CFLs are included in the DEER 2008 update documentation showing that the final EUL in years is always multiplied by the degradation factor. The DEER 2008 update documentation is available from www.deeresources.com: http://deeresources.com/files/deer0911planning/downloads/EUL\_Summary\_10-1-08.xls. The degradation factor is also included in ex ante database for DEER accessible via the REAI tool. Refer to the EUL table in the Support Tables section of the READI interface. [↑](#footnote-ref-8)
9. “Workpaper Disposition for Integral LED Lamp Replacements” California Public Utilities Commission, Energy Division, May 14, 2012 (originally published on the CPUC’s Basecamp Ex Ante Review project space; now available at www.deeresources.com/index.php/non-deer-workpapers) [↑](#footnote-ref-9)
10. “2013-2014 Work Order ED\_I\_Ltg\_1: LED Lab Test Study Draft Final Report”, submitted to California Public Utilities Commission, prepared by Itron, September 22, 2017 [↑](#footnote-ref-10)
11. “2015 Nonresidential ESPI Deemed Lighting Impact Evaluation Final Report” submitted to California Public Utilities Commission, prepared by Itron, March 31, 2017. [↑](#footnote-ref-11)
12. “Impact Evaluation of 2015 Upstream and Residential Downstream Lighting Programs” prepared for California Public Utilities Commission by DNVGL, April 1, 2017. [↑](#footnote-ref-12)
13. “COMPREHENSIVE WORKPAPER DISPOSITION FOR: SCREW-IN LAMPS, Revisions to Disposition Originally Issued on March 1, 2017”, California Public Utilities Commission, Energy Division, May 26, 2017. [↑](#footnote-ref-13)
14. “Final 2015 Efficiency Savings and Performance Incentive (ESPI) Uncertain List”, 1 December, 2014, Commission staff memo to R.13-11-005 Service List as directed by D.13-09-023. [↑](#footnote-ref-14)