Work Paper PGECOLTG164

**Revision 8**

**Short Form**

**Pacific Gas & Electric**

**LED Globe Lamps**

**Introduction**

This short form workpaper documents the values adopted from SCE’s workpaper entitled “SCE17LG130.2” for LED Globe lamps. SCE17LG130.2 adopted the measures from DEER 2019 and updated the cost with online web scraping using the same cost collection methodology in PGE workpaper PGECOLTG164 R7 LED Globe. SCE adopts all the DEER 2019 values with the following exceptions:

1. Cost collection methodology was based on PGE workpaper PGECOLTG164 R7 LED Globe, with prices updated to current 2018 values and additional costing samples added in wattage ranges that lacked sufficient sampling.
2. For measure case wattage ranges not included in DEER 2019, base case wattage ranges were determined using wattage reduction ratios (WRR) from DEER 2019 and 2018 Screw-In Lamp Savings Methods Disposition
3. New DEER LED NTG value is used for all measures – All-Ltg-LED-WRR.
4. MultiFamily Dwelling Area (MFm) uses the same 541 operating hours as the Residential Single Family (SFm).

# Document Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Rev** | **Date** | **Author** | **Summary of Changes** |
| 0 | 3/5/2012 | Daniel Young and Greg Barker (Energy Solutions) | Original workpaper |
| 1 | 6/8/2012 | Alina Zohrabian  (PG&E) | PGECOLTG164 R1 LED Globe.doc  Updated for 2013-14 |
| 1 | 8/29/2012 | Alina Zohrabian  (PG&E) | The “Com” and "RES" building types are the weighted up value from DEER building types. For Vintage AV is changed to EX and For Climate Zone All is changed to IOU. |
| 2 | 7/14/2013 | Alina Zohrabian  (PG&E) | Revised Savings values per ED Workpaper Disposition for Lighting Retrofit, issue March, 2013. For updated savings values, see file PGECOLTG164 R2-Calcs.xlsx.  For measure L0335 PG&E used 2 watts for the measure wattage this went down to 1 watt. For measure L0336 PG&E used 8 watts for the measure wattage this went down to 3 watts. |
| 3 | 3/24/2014 | Alina Zohrabian  (PG&E) | Added DI values from (PGE3PLTG180) and Revised savings values per ED Workpaper Disposition for lighting Retrofit, December 14, 2013. For updated savings values, see file PGECOLTG164 R3.xlsx. |
| 4 | 1/1/2016 | Linda Wan (PG&E)Alina Zohrabian (PG&E) | Updated NTG, EUL, annual hours of operation, CDF, IE per DEER 2016. Costs have also been updated. |
| 5 | 11/28/2016 | Mini Damodaran (PG&E) Alina Zohrabian (PG&E) | Updated Residential Interactive Effect(IE) per DEER 2017 |
| 6 | 6/29/2017 | Henry Liu (PG&E) | Updated NTG ID based on the 2017ScrewInLampDisposition |
| 7 | 4/27/2018 | Randy Kwok (PG&E) | Updated baseline technology % mix to 35% LED, 5% CFL, and 60% Incan and WRR = 4.68 for <3w, and WRR = 3.10 for >=3W per CPUC’s disposition “2018ScrewInLampSavingsMethods-1March2018”.  Updated NTG to new ID “All-Ltg-ScrwInLED”. Updated base case and measure cost. Effective 7/1/2018 per Disposition. |
| 8 | 12/29/2018 | Randy Kwok (PG&E) | Adopted SCE’s workpaper *SCE17LG130.2* (DEER 2019 savings values and cost update by web scraping). |

**Measure Differences Summary**

Table 1: Measure Differences Summary Table

| **Section** | **Value** |
| --- | --- |
| **Summary & Purpose** | This short form workpaper documents ex-ante load impacts and cost-effectiveness values for LED Globe Lighting. Savings calculation methodology was taken directly from DEER 2019, while costing methodology and eligibility requirements were taken from *PGECOLTG164 R7 LED Globe*. Only differences are explained here. |
| **1.1 Measure & Baseline** | Please refer to *PGECOLTG164 R8 LED Globe*.xlsx Calculation Template for the list of measure codes and baseline condition. |
| **1.2 Technical Description** |  |
| **Measures** | Please refer to *PGECOLTG164 R8 LED Globe.xlsx* for detail measure descriptions. |
| **Code for All Measures** | |  |  | | --- | --- | | SCE Code | PG&E Code | | LT-20537 | LT463 | | LT-20538 | LT464 | | LT-20539 | LT465 | | LT-20540 | LT466 | | LT-20541 | LT467 | | LT-20542 | LT468 | | LT-20544 | LT469 | | LT-20545 | LT470 | | LT-20546 | LT471 | | LT-20536 | LT472 | |  |  | |
| **Requirements** | Please refer to *PGECOLTG164 R7*.   * The customer must be a residential or commercial PG&E electric customer.   Note: Other program level restrictions and guidelines exist for this work paper. Please see the **Programs Restrictions and Guidelines** section of *PGECOLTG164 R7 - LED Globe Lamps* for more details. |
| **1.3 Installation Type and Delivery Mechanisms** |  |
| **Installation Type** | No difference |
| **Delivery Mechanisms** | Residential Mobile Home - Double-Wide, Residential Multi-family for Common and Dwelling area scenario:  Financial Support: Direct Install  Financial Support: Down-Stream Incentive - Deemed  Residential Single Family:  Up-Stream Programs: Up-Stream Incentive  Financial Support: Direct Install  Financial Support: Down-Stream Incentive - Deemed  Non-Residential:  Financial Support: Direct Install  Partnership: Direct Install  Financial Support: Down-Stream Incentive – Deemed  Financial Support: Down-Stream Incentive – Deemed - OBF  Partnership: Down-Stream Incentive – Deemed  Partnership: Down-Stream Incentive – Deemed - OBF  Mid-Stream Programs: Mid-Stream Incentive  Up-Stream Programs: Up-Stream Incentive |
| **1.4.1 DEER Data** |  |
| **Net-Gross-Ratio** | All-Ltg-LED-WRR |
| **Effective and Remaining Useful Life** | ILtg-Res-LED-15000hr  ILtg-Res-LED-20000hr  ILtg-Com-LED-15000hr  ILtg-Com-LED-20000hr |
| **Section 2. Calculation Methodology** |  |
| **Energy savings/Peak Demand Reduction – All Measures** | Energy savings are taken directly from DEER 2019 or calculated using DEER WRR methodology. The operating hours and interactive effects for all impacts were taken from the most applicable and updated DEER data. These interactive effects and operating hours were used to calculate energy savings for PG&E specific climate zones. |
| **Section 3. Load Shapes** | DEER:Indoor\_CFL\_Ltg |
| **Section 4. Costs** |  |
| **Section 4.1 Base and Measure Costs** | Costing methodology was taken from *PGECOLTG164 R7 LED Globe*. Refer to *SCE17LG130.2 A2 - Costs.xlsx* Cost Calculations for detailed baseline and measure costs. |

**Savings and Calculation Methodology**

Costing for this short form is based on PGE workpaper *PGECOLTG164 R7 LED Globe*, which used prices obtained through web scraping. These prices were updated to 2018 values, and additional costing samples added in wattage ranges that lacked sufficient sampling.

Measure case costs were based on LED lamps, while base case costs were based on a blend of LED, CFL, and Halogen lamp costs obtained from the 2018 DEER Lamp disposition. LED lamp costs were calculated by applying a linear best fit line based on average cost per watt. Baseline CFL costs were updated based on a linear best fit line for the average lamp cost per incandescent wattage equivalent. The halogen lamp costs were found not to have a good correlation so costs were calculated by taking binned averages of various incandescent equivalent wattage groups. See *SCE17LG130.2 A2 - Costs.xlsx* for details. The labor costs were derived by dividing the hourly rate of $72.26 by 5 minutes of total labor for installing this lamp. The actual labor cost comes out to be $3.61.

Savings impacts for each measure were taken from DEER 2019. The overall calculation methodology has not changed from the methodology found in DEER 2019.

**Attachments**

1. PGECOLTG164 R8 LED Globe.xlsx
2. SCE17LG130.2 A2 – Cost Calculations.xls