**Work Paper SCE13LG090**

**Revision 1**

**Southern California Edison Company**

**Interior Induction Lighting**

# At-a-Glance Summary

|  |  |
| --- | --- |
| ****Applicable Measure Codes:**** | *LT-51211, LT-26734, LT-80108, LT-34098, LT-69009* |
| **Measure Description:** | Replacement induction lighting fixtures which must be more efficient and have a lower Wattage value than the base case. |
| **Base Case Description:** | The existing interior lights must be incandescent, mercury vapor, standard metal halide, or high pressure sodium. |
| **Energy Impact Common Units:** | Per fixture |
| **Energy Savings :** | Refer to Excel Calculation Attachment |
| **Gross Measure Cost ($/unit)** | Refer to Excel Calculation Attachment |
| **Measure Incremental Cost ($/unit):** | Refer to Excel Calculation Attachment |
| **Effective Useful Life (years):** | EUL varies by building type. EUL = 14.3 for Grocery and Food Store; EUL = 13.3 for Health / Medical – Hospital; EUL = 14.7 for Warehouse-Refrigerated; EUL = 15 for all other building types. |
| **Measure Application Type:** | Replace on Burnout (ROB). |
| **Net-to-Gross Ratios:** | NTG = 0.6 Sectors and Program Delivery types herein. |
| **Important Comments:** | -This workpaper document does not contain a data set in conformance with the 4/1/14 CPUC Ex Ante Database Specification; SCE will provide that data set separately. |

# Document Revision History

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Workpaper and Revision # | Tech. Revision | MM/DD/YY | Author/Affiliation | Summary of Changes |
| SCE13LG090.0 | Yes | 04/02/2012 | James Gowen/Matrix | Updated work paper to new template |
| SCE13LG090.1 | Yes | 7/24/14 | David Pruitt/PL Energy | -New template for 2015 program year.  - Used measure Wattages from the ED lighting disposition table dated 30 May, 2014. |
| Jack Melnyk/SCE | -Updated Calc Templ to v4 2015  -Removed RET install type  -Modified some measure and base wattages from the ED disposition  -Work paper updated for reporting period, effective 7/1/2014-12/31/2014 |

# Section 1. General Measure & Baseline Data

## 1.1 Measure Description & Background

This work paper documents the E3 Calculator input values for replacing an existing interior lighting fixture with a more efficient induction lighting fixture. Table 1 below shows the 5 measure classifications that the existing base case wattage can fall into.

Table 1 Measure Names

|  |  |
| --- | --- |
| Solution Code | Measure name |
| LT-51211 | Up to 70 Watt Interior Fixture Induction replacing less than or equal to 100 Watt lamp base case |
| LT-26734 | Up to 120 Watt Interior Fixture Induction replacing 101 - 175 Watt lamp base case |
| LT-80108 | Up to 180 Watt Interior Fixture Induction replacing 176 - 399 Watt lamp base case |
| LT-34098 | Up to 250 Watt (Tier 1) Interior Fixture Induction replacing 400 Watt lamp base case |
| LT-69009 | Up to 360 Watt (Tier 2) Interior Fixture Induction replacing 400 Watt lamp base case |

The existing interior lights being replaced must be incandescent, mercury vapor, standard metal halide, or high pressure sodium. In all cases, the replacement induction fixture must be lower wattage than the existing base case and all base cases and measure cases must fall into the wattage classifications shown in Table 1.

## 1.2 Technical Description

This work paper details the replacement of existing incandescent, mercury vapor, standard metal halide, or high pressure sodium interior lighting fixtures with more efficient linear induction fixtures

## 1.3 Measure Application Type

Note: See Appendix A for a comparison of the application types used by and incorporated into SCE systems versus the application types available in the newest revision of DEER 2014. Appendix A will serve as a translation between the outputs of this workpaper and application types used by READi.

The delivery method that is available for these measures are:

* Financial Support - Down-Stream Incentive – Deemed
* Midstream Programs - Mid-Stream Incentive

The install types are:

* Replace-on-Burnout (ROB)

## 1.4 Measure and Base Case Cost Effectiveness Data

### 1.4.1 DEER Measure and Base Case Analysis

Interior induction fixture measures are not included in the Database for Energy Efficient Resources (DEER) Version 2011 v4.00 [A].

Table 2 DEER Difference Summary

|  |  |
| --- | --- |
| DEER Difference Summary Table | |
| Modified DEER Methodology | No |
| Scaled DEER Measure | No |
| DEER Building Prototypes Used | No |
| Deviation from DEER | DEER does not contain this type of measure. |
| DEER Version | N/A |
| DEER Run ID and Measure Name (Sample) | N/A |

**Net to Gross**

The NTG value was obtained from the “DEER2011\_NTGR\_2012-05-16.xls” on the DEER website as required by Version 5 of the California Public Utilities Commission (CPUC) Energy Efficiency Policy Manual [351]. The relevant NTGR for this measure is shown in Table 3 below.

Table 3 Net-to-Gross Ratio

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| NTGR\_ID\* | Description\* | Sector\* | BldgType\* | ProgDelivID | NTG\* |
| Com-Default>2yrs | All other EEMs with no evaluated NTGR; existing EEM in programs with same delivery mechanism for more than 2 years | Com | Any | All | 0.6 |
| Ind-Default>2yrs | All other EEMs with no evaluated NTGR; existing EEM in programs with same delivery mechanism for more than 2 years | Ind | Any | All | 0.6 |
| Agric-Default>2yrs | All other EEMs with no evaluated NTGR; existing EEM in programs with same delivery mechanism for more than 2 years | Ag | Any | All | 0.6 |

\*Denotes that the column is taken from the DEER NTG Table.

**Installation Rate**

The installation rate (IR) is identified in the calculation attachment. This value is obtained from the support table available in READi. Currently there is no versioning on the installation rate table. To address appropriate selection of the installation rate the date of the workpaper will serve as the last date checked for updated IR values. The installation rate varies by end use, sector, technology, application, and delivery method. The relevant IR values for this measure are shown in Table 4 below.

Table 4 Installation Rate

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| GSIA\_ID\* | Description\* | Sector\* | BldgType\* | ProgDelivID | GSIAValue\* |
| Def-GSIA | Default GSIA values | Any | Any | Any | 1.0 |

**Spillage Rate**

Spillage rate will also be applied to measures however the values will not be tracked in the workpapers. The spillage rate will be tracked in an external table to be supplied to the Energy Division.

**READi Technology Fields**

To support the development of the ED ex ante tables, select fields from the ex ante database will be identified in the workpaper. For a full set of values associated with the measures in the workpaper refer to the Excel calculation template.

Table 5 READi Tech IDs

|  |  |
| --- | --- |
| READi Field Name | Values included in this workpaper |
| Measure Case UseCategory | Lighting |
| Measure Case UseSubCats | Indoor General Lighting |
| Measure Case TechGroups | Lighting – Fixtures |
| Measure Case TechTypes | Induction Fixture |
| Base Case TechGroups | Lighting – Fixtures |
| Base Case TechTypes | HID Fixture |

### 1.4.2 Codes and Standards Analysis

Title 24 2013 [355] Section 150.0(k)1 contains codes related to Residential lighting which includes a minimum 50 percent of total rated wattage in kitchen to be high efficacy, and non-high efficacy lighting to be controlled by vacancy sensors in certain areas for new construction. The measures in this work paper for Residential building types are not affected by this code.

These fixture replacements are covered by the luminaire alterations requirements of Title 24, 2013. The requirements are in Section 141.0 and include the following:

**Lighting System Alterations** shall meet the applicable requirements in TABLE 141.0-E and the

following:

1. Lighting System Alterations include alterations where an existing lighting system is modified, luminaires are replaced, or luminaires are disconnected from the circuit, removed and reinstalled, whether in the same location or installed elsewhere.

**EXCEPTION 1 to Section 141.0(b)2Iii:** Alterations that qualify as a Luminaire Modification-in-

Place.

**EXCEPTION 2 to Section 141.0(b)2Iii:** Portable luminaires, luminaires affixed to moveable

partitions, and lighting excluded in accordance to Section 140.6(a)3.

These measures remove and replace the actual fixture (at various quantity and allowed lighting power levels), therefore the code is invoked.

Title 20 [422] Appliance Efficiency Regulations include an Energy Efficiency Standard for Metal Halide Luminaires. Probe-start ballasts metal halide luminaires rated at least partially within the range of 150 to 500 watts are not eligible. Additionally, metal halide luminaires that are not probe-start ballasts must comply with Section 1605.3(n)(2)(A) and 1605.3(n)(2)(B) as applicable.

Effective July 14th, 2012, multiple T12 lamp types will be impacted by the new US Department of Energy standards set for general service fluorescent lamps. Accordingly, T12 fixtures are being phased out as an eligible baseline lighting technology for the purpose of calculating energy savings for lighting retrofit projects [B]. In accordance with this requirement, all T12 fixtures are not eligible as Base Case for this measure.

Table 6 Code Summary

|  |  |  |
| --- | --- | --- |
| Code | Applicable Code Reference | Effective Dates |
| Title 24 (2013) | 2013-2014 Non-Residential Compliance Manual, Section 141.0 | July 1, 2014 |
| Title 20 (2014) | Section 1605.3(n) Energy Efficiency Standard for Metal Halide Luminaires | May 1, 2014 |
| US DOE Standards (2009) | DOE 10 CFR Part 30 | July 14th, 2012 |

It should be noted that Title 24 2013 treats the lighting of covered parking lot decks (their contiguous parking areas and loading and unloading areas), stairwells and common area corridors (which provide access to guest rooms and dwelling units of high-rise residential buildings and hotel/motels) as indoor lighting.

### 1.4.3 Non-DEER Study Review

No non-DEER studies or data were reviewed for this Workpaper.

### 1.4.4 Measure and Base Case Effective Useful Life

DEER14 update documentation provides EUL and RUL information to be used for the 2015 program cycle extension on [www.deeresources.com](http://www.deeresources.com). The DEER documentation “Summary of EUL-RUL Analysis for the April 2008 Update to DEER” provides the RUL value as a flat 1/3 of the EUL value. The RUL value will only be applied to the first baseline period for retrofit measures that have applicable code that will affect the energy savings. In all other installation types and retrofit with no applicable code that affects the energy savings, the RUL is not applicable to either the first or second baseline period.

To obtain the EUL value the DEER14 update documentation, EUL\_Summary\_10-1-08.xls [213], was consulted. There is no unique EUL\_ID for the induction fixture measure. Therefore, ILtg-Lfluor-Elec is used for all measures.

Table 7 below identifies the EUL/RUL value/methodology used for the measures in this work paper.

Table 7 DEER14 EUL Value/Methodology

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| READi EUL ID | Market | Enduse | Measure | EUL (Years) | RUL (Years) |
| ILtg-Lfluor-Elec | Non-Residential | Lighting | Linear Fluorescent with Electronic Ballast | Varies; 70000/building operating hours or 15 years | N/A |

Table 8 EUL by Building Type

| **Building Type** | **Annual Operating Hours** | **EUL** |
| --- | --- | --- |
| Agricultural | 3600.0 | 15.0 |
| Assembly | 2610.0 | 15.0 |
| Education - Primary School | 2140.0 | 15.0 |
| Education - Secondary School | 2280.0 | 15.0 |
| Education - Relocatable Classroom | 2480.0 | 15.0 |
| Education - Community College | 2420.0 | 15.0 |
| Education - University | 2350.0 | 15.0 |
| Grocery | 4910.0 | 14.4 |
| Food Store | 4910.0 | 15.0 |
| Health/Medical - Hospital | 5260.0 | 13.4 |
| Health/Medical - Nursing Home | 4160.0 | 15.0 |
| Health/Medical - Clinic | 4160.0 | 15.0 |
| Lodging - Hotel | 1950.0 | 15.0 |
| Lodging - Guest Rooms | 1550.0 | 15.0 |
| Lodging - Motel | 1550.0 | 15.0 |
| Manufacturing - Bio/Tech | 3530.0 | 15.0 |
| Manufacturing - Light Industrial | 3220.0 | 15.0 |
| Industrial | 3220.0 | 15.0 |
| Misc - Commercial | 3600.0 | 15.0 |
| Office - Large | 2640.0 | 15.0 |
| Office - Small | 2590.0 | 15.0 |
| Restaurant - Fast-Food | 4840.0 | 14.5 |
| Restaurant - Sit-Down | 4830.0 | 14.5 |
| Retail - Multistory Large | 3380.0 | 15.0 |
| Retail - Single-Story Large | 4270.0 | 15.0 |
| Retail - Small | 3380.0 | 15.0 |
| Storage - Conditioned | 3420.0 | 15.0 |
| Storage - Unconditioned | 3420.0 | 15.0 |
| Transportation - Communication - Utilities | 3600.0 | 15.0 |
| Warehouse - Refrigerated | 4770.0 | 15.0 |

# Section 2. Energy Savings & Demand Reduction Calculations

To document savings for this work paper, measure case and base cases were selected that represent an appropriate replacement and most are near the upper bound of the acceptable replacement wattage to be conservative in the saving estimates as these measures will represent a large majority of similar replacements.

For each of the measure classifications, a typical Metal Halide lamp and fixture were selected in the appropriate ranges used in the energy savings estimates. The lamps were chosen in the middle to lower section of the range to be conservative. The fixture wattage is taken from Appendix B of the 2013 SPC Program Manual [431]. The base cases and code cases used in the calculations are shown in Table 8 below.

The base case Wattage values for a number of the following measures were updated using the “2013-2014\_LightingRetrofit\_Disposition-30May2014” table provided by the Energy Division [E]. The values that have been revised using the Disposition table are noted with an asterisk (\*). These updated values have replaced the values found in the 2009 SPC Program Manual [C].

Table 8 Base Case Selection for Savings Estimates

| **Measure Description Classifications** | **Base Case** | **Base Case Fixture Code** | **Base Case Fixture Wattage** | **Code Case** | **Code Case Fixture Code** | **Code Case Fixture Wattage** |
| --- | --- | --- | --- | --- | --- | --- |
| Up to 70 Watt Interior Fixture Induction replacing less than or equal to 100 Watt lamp base case | Metal Halide, (1) 100W lamp | MH100/1 | 128 | N/A | N/A | 128 |
| Up to 120 Watt Interior Fixture Induction replacing 101 - 175 Watt lamp base case | Metal Halide, (1) 150W lamp | MH150/1 | 190\* | N/A | N/A | 190\*\* |
| Up to 180 Watt Interior Fixture Induction replacing 176 - 399 Watt lamp base case | Metal Halide, (1) 250W lamp | MH250/1 | 295\* | Pulse Start, (1) 200W lamp | PSMH-200W | 232\*\* |
| Up to 250 Watt (Tier 1) Interior Fixture Induction replacing 400 Watt lamp base case | Metal Halide, (1) 400W lamp | MH400/1 | 458 | Pulse Start, (1) 350W lamp | PSMH-350W | 400\*\* |
| Up to 360 Watt (Tier 2) Interior Fixture Induction replacing 400 Watt lamp base case | Metal Halide, (1) 400W lamp | MH400/1 | 458 | Pulse Start, (1) 400W lamp | PSMH-400W | 456\*\* |

\*This value comes from the previous revision of this work paper (Revision 1) and differs from the May 30 disposition value. Since the disposition document only addresses code baseline and not the measure case, it is unclear why the disposition’s recommended measure case wattages differ from those in Revision 0 of this work paper. Therefore, the disposition value is not used.

\*\*This is the wattage for a PSMH fixture that is lumen equivalent to the measure case fixture. This value differs from the May 30 disposition value.

The measure case Wattage values for all the measures were taken from the “2013-2014\_LightingRetrofit\_Disposition-30May2014” table provided by the Energy Division [E].

Table 9 Measure Case Selection for Savings Estimates

| **Measure Description Classifications** | **Measure Case Selection** | **Lamp Wattage** | **Fixture Wattage** |
| --- | --- | --- | --- |
| Up to 70 Watt Interior Fixture Induction replacing less than or equal to 100 Watt lamp base case | 70W Induction Lamp | 40 | 44\* |
| Up to 120 Watt Interior Fixture Induction replacing 101 - 175 Watt lamp base case | 120W High Bay Induction Fixture | 100 | 110\* |
| Up to 180 Watt Interior Fixture Induction replacing 176 - 399 Watt lamp base case | 180W High Bay Induction Fixture | 150 | 165\* |
| Up to 250 Watt (Tier 1) Interior Fixture Induction replacing 400 Watt lamp base case | 250W High Bay Induction Fixture | 200 | 220\* |
| Up to 360 Watt (Tier 2) Interior Fixture Induction replacing 400 Watt lamp base case | 360W High Bay Induction Fixture | 300 | 330\* |

\*Industry study shows the connected load of the induction fixtures are 10% above the nominal lamp wattage.

Table 10 shows the delta watts and the code delta watts for the measures in this work paper.

Table 10 Delta Watts

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Solution Code | Measure name | Base Watts | Code Watts | Measure Watts | Measure Delta Watts | Code Delta Watts |
| LT-51211 | Up to 70 Watt Interior Fixture Induction replacing less than or equal to 100 Watt lamp base case | 128 | 128 | 44 | **84** | **84** |
| LT-26734 | Up to 120 Watt Interior Fixture Induction replacing 101 - 175 Watt lamp base case | 190 | 190 | 110 | **80** | **80** |
| LT-80108 | Up to 180 Watt Interior Fixture Induction replacing 176 - 399 Watt lamp base case | 295 | 232 | 165 | **130** | **67** |
| LT-34098 | Up to 250 Watt (Tier 1) Interior Fixture Induction replacing 400 Watt lamp base case | 458 | 400 | 220 | **238** | **180** |
| LT-69009 | Up to 360 Watt (Tier 2) Interior Fixture Induction replacing 400 Watt lamp base case | 458 | 456 | 330 | **128** | **126** |

“The methodology of calculating energy savings for Non-CFL lamps follows a simple formula that captures wattage level changes, annual hours of use, and interactive effects on other end-uses. For the most part, the methodology for calculating the energy savings for the Non-CFL interior lights is the same as for interior CFL lamps. The exception is that all installation rates are assumed to be 100% for Non-CFL interior lighting measures*.*” [26]

**Equation 1** illustrates the energy savings estimation methodologies used to calculate Non-CFL interior lighting measures.

  Equation 1

**Equation 2** illustrates a step-by-step sample calculation for the solution code LT-26734 (Up to 120 Watt Interior Fixture Induction replacing 101 - 175 Watt lamp base case ), ROB measure, Education – Primary School market sector, Climate Zone 6, using the methodology shown in Equation 1**.** The Energy Savings values listed in the Calculation Template [D] use the same methodologies for all market sectors as derived here for the Education – Primary School market sector and can also be found in the attachment section.

 Equation 2

“The methodology of calculating demand reduction for Non-CFL lamps follows a simple formula that captures Wattage level changes, interactive effects on other end-uses, and coincidence factor for peak demand. For the most part, the methodology for calculating the demand reduction for the Non-CFL interior lights is the same as for interior CFL lamps. The exception is that all installation rates are assumed to be 100% for Non-CFL interior lighting measures.” [26]

**Equation 3** illustrates the peak demand reduction estimation method used.

 Equation 3

**Equation 4** illustrates a step-by-step sample calculation for solution code LT-26734 (Up to 120 Watt Interior Fixture Induction replacing 101 - 175 Watt lamp base case ), ROB measure, Education – Primary School market sector, Climate Zone 6,using the methodology illustrated in Equation 3. The Demand Reduction values listed in the Calculation Template [D] uses the same methodologies for all market sectors as derived here for the Education – Primary School market sector and can also be found in the attachment section.

 Equation 4

# Section 3. Load Shapes

The difference between the base case load shape and the measure load shape would be the most appropriate load shape; however, only end-use profiles are available. Therefore, the closest load shape chosen for this measure is the DEER:Indoor\_Non-CFL\_Ltg load shape. See Table 11 for a list of all Building Types and Load Shapes. See the KEMA report [31] for a more thorough discussion regarding the load shapes for this measure.

Table 11 Building Types and Load Shapes

|  |  |  |
| --- | --- | --- |
| Building Type | E3 Alt. Building Type | Load Shape |
| Agricultural | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Assembly | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Health/Medical - Clinic | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Education - Community College | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Education - Primary School | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Education - Relocatable Classroom | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Education - Secondary School | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Education - University | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Food Store | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Grocery | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Lodging - Guest Rooms | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Health/Medical - Hospital | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Lodging - Hotel | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Industrial | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Manufacturing - Bio/Tech | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Misc - Commercial | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Manufacturing - Light Industrial | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Lodging - Motel | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Health/Medical - Nursing Home | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Office - Large | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Office - Small | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Restaurant - Fast-Food | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Restaurant - Sit-Down | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Retail - Multistory Large | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Retail - Single-Story Large | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Retail - Small | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Storage - Conditioned | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Storage - Unconditioned | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Transportation - Communication - Utilities | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |
| Warehouse - Refrigerated | NON\_RES | DEER:Indoor\_Non-CFL\_Ltg |

# Section 4. Base Case & Measure Costs

## 4.1 Base Case Cost

The base case and code base case costs were taken from DEER 2008. See Table 12 for base case and code base case costs.

## 4.2 Measure Case Cost

The measure costs were taken from multiple online retailers [F] and averaged. These costs are shown in Table 12.

**Table 12 Measure Cost**

| Description | Measure Case Fixture Wattage | Measure Cost | Base Case Wattage | Base Cost | Code Base Case Cost |
| --- | --- | --- | --- | --- | --- |
| Up to 70 Watt Interior Fixture Induction replacing less than or equal to 100 Watt lamp base case | 40 | $313.44 | ≤100 | $132.51 | N/A |
| Up to 120 Watt Interior Fixture Induction replacing 101 - 175 Watt lamp base case | 100 | $327.92 | 101 - 175 | $137.67 | $135.34 |
| Up to 180 Watt Interior Fixture Induction replacing 176 - 399 Watt lamp base case | 150 | $545.06 | 176 - 399 | $152.84 | $148.33 |
| Up to 250 Watt (Tier 1) Interior Fixture Induction replacing 400 Watt lamp base case | 200 | $498.96 | 400 | $164.40 | $203.54 |
| Up to 360 Watt (Tier 2) Interior Fixture Induction replacing 400 Watt lamp base case | 300 | $632.30 | 400 | $164.40 | $203.54 |

## 4.3 Gross and Incremental Measure Cost

### 4.3.1 Gross Measure Cost

For ROB, the equipment being replaced is assumed to have failed in place or has operated past its useful life. The customer is faced with either purchasing standard efficiency or code baseline equipment versus energy efficient equipment. Therefore, gross measure cost (GMC) means the cost premium required to install the energy efficient measure over a less efficient piece of equipment. GMC is represented by the equation below:

GMC = (Measure Equipment Cost + Measure Labor Cost) –

(Code Base Case Equipment Cost + Code Base Case Labor Cost)

= (Measure Equipment Cost – Code Base Case Equipment Cost)

\*Note: Unless stated otherwise the measure case labor and base case labor are assumed to be the same value.

**Table 13 Measure Cost**

| Solution Code | Description | Measure Cost | Base Cost | Gross Measure Cost |
| --- | --- | --- | --- | --- |
| LT-51211 | Up to 70 Watt Interior Fixture Induction replacing less than or equal to 100 Watt lamp base case | $313.44 | $132.51 | $180.93 |
| LT-26734 | Up to 120 Watt Interior Fixture Induction replacing 101 - 175 Watt lamp base case | $327.92 | $135.34 | $192.58 |
| LT-80108 | Up to 180 Watt Interior Fixture Induction replacing 176 - 399 Watt lamp base case | $545.06 | $148.33 | $396.73 |
| LT-34098 | Up to 250 Watt (Tier 1) Interior Fixture Induction replacing 400 Watt lamp base case | $498.96 | $203.54 | $295.42 |
| LT-69009 | Up to 360 Watt (Tier 2) Interior Fixture Induction replacing 400 Watt lamp base case | $632.30 | $203.54 | $428.76 |

See the cost spreadsheet [F] for calculation of GMC. They are also in the calculations template [D].

### 4.3.2 Incremental Measure Cost

Incremental Measure Cost is the same as Gross Measure Cost

# Attachments

1. 2. 

3. 2013-2014\_LightingRetrofit\_Disposition-30May2014

# References



[26]

[31]

[132]

[213]

[351]

[355]

[422]

[431]

[A] DEER Database for Energy-Efficient Resources Version 2011 4.00 for 13-14, [www.deeresources.com](http://www.deeresources.com)

[B] 2012 Statewide Customized Offering Procedures Manual For Business – Customized 1.0 Policy

<http://www.sce.com/business/ems/customized-solutions/tools-resources.htm>

[C] Southern California Edison Company, prepared by the Statewide SPC Team. (2013). “2013 SPC Procedures Manual,” Appendix B Table of Standard Fixture Wattage and Sample Lighting Table - Version 5.0.

[D]Attachment 1 – Calculations Template v0.1.xlsm

[E] Attachment 3 - 2013-2014\_LightingRetrofit\_Disposition-30May2014

[F] Attachment 2 – Interior Induction Lighting Costs.xlsx

# Appendix A – SCE/ED Application Types

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| SCE Program Type | ED Application Type | 1st Baseline Savings | 2nd Baseline Savings | 1st Baseline Cost | 2nd Baseline Cost | 1st Baseline Life | 2nd Baseline Life |
| New | New Construction (Nc) | Above Code/Standard | N/A | Incremental Cost | N/A | EUL | 0 |
| Replace on Burnout (ROB) | Replace on Burnout (Rob)/Normal Replacement (NR) | Above Code/Standard | N/A | Incremental Cost | N/A | EUL | 0 |
| Retrofit (RET) | Early Replacement (ER) | Above Cust. Existing | Above Code/Standard | Full Cost | Incremental Cost | RUL | EUL-RUL |
| Retrofit – First Baseline Only (REF) | Early Replacement RUL (ErRul) | Above Cust. Existing | N/A | Full Cost | N/A | EUL | 0 |
| Retrofit Add-on (REA) | N/A | Above Cust. Existing | N/A | Full Cost | N/A | EUL | 0 |