Short Form Work Paper WPSDGENRCS0001

**Revision 1**

**San Diego Gas & Electric**

**Energy Efficiency Engineering**

**Vending Machine Controller**

**December 16, 2016**

# SDG&E Vending Machine Controller

## Introduction

This short form workpaper documents (WP) the values adopted from SCE WP entitled “Beverage Merchandize Controller” (SCE13CS005.2 Beverage Merchandize Controller\_Final.docx). SDG&E adopts all of the product code assumptions and values as stated in SCE13CS005 R2 Beverage Merchandize Controller (product codes RF-75217 Cold Vending Machine Controls), with the following exceptions:

1. SDG&E only offers Refrigerated Vending Machine Controller (Product Code for SCE and PGE are RF-75217 and R-86) with the follow SDG&E product codes 402250, 421038, and 463774.
2. SDG&E will not be adopting the following SCE measures codes and product codes.

|  |  |  |  |
| --- | --- | --- | --- |
| **Measure Codes** | | | **Measure Name** |
| PGE | SDG&E | SCE |
| N/A | N/A | RF-48900 | Double Door Beverage Merchandise Cooler Control |
| N/A | N/A | RF-56733 | One Door Beverage Merchandise Cooler Control |
| N/A | N/A | RF-65065 | One Door Under Counter Beverage Merchandise Cooler Control |
| N/A | N/A | RF-70008 | Triple Door Beverage Merchandise Cooler Control |
| R-98 | N/A | LT-85945 | Snack Vending Machine Controls |

## Document Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Rev** | **Date** | **Author** | **Summary of Changes** |
| 0 | 06/15/2012 | Kelvin Valenzuela /  SDG&E | Adopted from PGECOREF111 R3 Vending  Machine Controller.doc, updated June 7,  2012 |
| 0.1 | **06/26/2014** | Judelson Enriquez /  RMS Energy Consulting,  LLC | INTERNAL REVISION ONLY -no material  impacts made  Updated code analysis to 2014 T20. |
| 2.0 | 12/16/2016 | Eduardo Reynoso  SDG&E | Adopted SCE13CS005 R2 Beverage Merchandize Controller\_Final.docx, updated on November 10, 2015.  -PG&E also adopted SCE13CS005 R2 on November 10, 2015, and limited to SCE product code RF-75217 and LT85945.  -SDG&E created three implementation product codes (402250, 421038, and 463774) for Vending Machine Controller measure (SCE13CS005.2 product code RF-75217) to address the various delivery (Direct Install/ Downstream Rebate) and sector types (Non-Res/ Res). |

## Measure Summary

Table : Measure Summary Table

| **Section** | **Value** |
| --- | --- |
| **Summary & Purpose** | This short form workpaper documents ex-ante load impacts and cost-effectiveness values for installing Vending Machine Controls (VMC) is based on cycling compressor on/off; turning off the lights and compressor when surrounding area is unoccupied. The base energy consumption and measure energy consumption values are from SCE’s workpaper, SCE13CS Revision 2 dated November 10, 2015 (PGECOREF111 Rev5 adopted SCE workpaper) and considered to be the IOU lead for this Deemed workpaper technology. Since SDG&E’s measure offering is different than that of SCE’s, SDG&E’s product code has been substituted to create a total of 1 (one) measure with 3 (three) implementation offerings with implementation code 402250, 421038, and 463774 to address sector and delivery types. |
| * 1. **Measure & Baseline Data** | Measures:  Measure 1:   |  |  |  |  | | --- | --- | --- | --- | | Measure Codes | | | Measure Name/ Description | | PG&E | SCE | SDG&E | | R-86 | RF-75217 | 402250  421038  463774 | Refrigerated Vending Machine Controller |   SCE workpaper measures not being adopted by SDG&E are:   |  |  | | --- | --- | | SCE  Measure Code | Measure Name/ Description | | RF-48900 | Double Door Beverage Merchandise Cooler Control | | RF-56733 | One Door Beverage Merchandise Cooler Control | | RF-65065 | One Door Under Counter Beverage Merchandise Cooler Control | | RF-70008 | Triple Door Beverage Merchandise Cooler Control | | LT-85945 | Snack Vending Machine Controls | |
| **1.2 Technical Description** |  |
| Measures | As cited per SCE Workpaper Requirements   |  |  | | --- | --- | | **Case** | **Description of Typical Scenario** | | Measure | 1. Self-contained vending machine with an occupancy sensor-based vending machine controller (VMC). | | Existing Condition | 1. Beverage merchandise cooler without BMC 2. Vending machine without VMC | |
| Code for All Measures  (As Cited per SCE Workpaper and Document Revision History) | As cited in SCE (and PGE) workpaper:  For canned vending machines the maximum daily energy consumption set up by the federal requirements in CFR Title 10 Part 431 Subpart Q §431.296 (b) are identical to the requirements in CA Title 20 Table A-8. For purposes of the calculations in Section 2, CA Title 20 is referenced. |
| Requirements  As Cited per SCE and PG&E Workpapers and Document Revision History | As cited per SCE (and PGE) workpaper.   * Building types: All Non-Residential; Residential Mobile Home; Residential Multi-Family. * Existing beverage merchandise coolers must: |
| **1.3 Installation Type and Delivery Mechanisms** |  |
| Installation Type | Retrofit Add-on (REA) |
| Incentive Method Descriptions | |  |  | | --- | --- | | **Incentive Method** | **Description** | | Direct Install | The program implements energy efficiency measures for qualifying customers, at no cost to the customer. | | Down-Stream Incentive | The customer installs qualifying energy efficient equipment and submits an incentive application to the utility program. Upon application approval, the utility program pays an incentive to the customer. Such an incentive may be deemed or customized. | |
| **1.4.1 DEER Data** |  |
| Net-to-Gross Ratio | |  |  |  |  |  | | --- | --- | --- | --- | --- | | **NTGR ID** | **Sector** | **BldgType** | **Measure Delivery** | **NTGR** | | Com-Default>2yrs | Com | Any | All | 0.6 | | Com-Default>2yrs | Com | Any | DirInstall | 0.6 | | Res-Default>2 | Res | Any | DirInstall | 0.55 | | Res-Default>2 | Res | Any | All | 0.55 | |
| Effective and Remaining Useful Life | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **EUL ID** | **Description** | **Sector** | **UseCategory** | **EUL (Years)** | **RUL (Years)** | | Plug-VendCtrler | Vending Machine Controller | Com | Vending | 5 | 1.7 | |
| **Section 2. Calculation Methodology** | DEER 2016 as cited per “SCE13SC005.2 Beverage Merchandize Controller\_Final.docx” |
| Energy Savings/Peak Demand Reduction – All Measures | (As Cited by SCE Workpaper per Document History Revision)  **Interactive Effects:** Interactive effects will not be applied to the energy savings.  **Demand Reduction:** No demand reduction will occur during the DEER peak period.  **Measure Calculated Summary** (As cited per SCE13CS005.2 Beverage Merchandize Controller workpaper) and savings is per controller (each).   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Solution Codes** | | **Measure Name/ Description** | **Backlit Signage** | **Vending Machine** | | **SCE** | **SDG&E** | | RF-75217 | 402250  421038  463774 | Refrigerated Vending Machine Controller | 0.072kW \* Hours Off per year | 226.04 kWh |     Equation in SCE’s WP: 226.04+(0.072x(8760-(Hours off per Year)) = KWh savings.  Savings Impacts by Building Type, Vintage, and Climate Zone:   |  |  |  |  | | --- | --- | --- | --- | | Building Type | BldgVint | BldgLoc | KWh Savings | | Asm | Ex | IOU | 775.4 | | DMo | Ex | IOU | 817.808 | | ECC | Ex | IOU | 701.24 | | EPr | Ex | IOU | 772.52 | | ERC | Ex | IOU | 787.856 | | ESe | Ex | IOU | 742.28 | | EUn | Ex | IOU | 714.2 | | Gro | Ex | IOU | 517.64 | | GsR | Ex | IOU | 784.76 | | Hsp | Ex | IOU | 491 | | Htl | Ex | IOU | 769.64 | | MBT | Ex | IOU | 696.92 | | MFm | Ex | IOU | 817.808 | | MLI | Ex | IOU | 689.72 | | Mtl | Ex | IOU | 784.76 | | Nrs | Ex | IOU | 571.64 | | OfL | Ex | IOU | 707.72 | | OfS | Ex | IOU | 746.6 | | RFF | Ex | IOU | 577.4 | | RSD | Ex | IOU | 632.12 | | Rt3 | Ex | IOU | 478.76 | | RtL | Ex | IOU | 637.16 | | RtS | Ex | IOU | 659.48 | | SCn | Ex | IOU | 710.6 | | SUn | Ex | IOU | 722.12 | | WRf | Ex | IOU | 534.92 | |  | | | | |
| **Section 3. Load Shapes** | SDGE:01-ALC-AllCommercial-Refrig  SDGE:03-BCR-BothResidentialCommercial-LIT\_EXT |
| **Section 4. Costs** |  |
| **Section 4.1 Base and Measure Costs** | - All Downstream rebate cost cite SCE Workpaper per Document Revision History.  - Direct Install Cost not provided and negotiated independently of SCE13CS005.2 workpaper. |
| Base Cost |  |
| 402255  421038  463774 | BASE =$0.00 (Product Codes for SCE and PGE are RF-75217 and R86) |
| Measure Cost |  |
| 402255  421038  463774 | Product Codes for SCE and PGE are RF-75217 and R86. Cost cited per SCE workpaper.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Measure Code** | | **Installation Type** | **Incremental Measure Cost** | **Full Measure Cost** | | SCE | SDG&E | | RF-75217 | 402250  421038  463774 | REA | (MEC + MLC)  = $256.88 | MEC + MLC)  =$256.88 |   MEC = Measure Equipment Cost = $189.00  MLC = Measure Labor Cost = $67.88 |