Work Paper SCE17CC016

**Revision 0**

**Short Form**

**Southern California Edison**

**Energy Efficient Door-Type Commercial Dishwashers**

**Introduction**

This short form workpaper documents the values adopted from PGE’s WP entitled “Energy Efficient Door-Type Commercial Dishwashers” (PGECOFST126 R0). SCE adopts all the values in PGECOFST126 R0 with no changes.

# Document Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Rev** | **Date** | **Author** | **Summary of Changes** |
| 0 | 8/4/2017 | Lake Casco (TRC) | 1. Transferred savings values to SCE Calculation template for the 2017 program year. 2. Calculation templates were developed based on PGE’s template “ex\_ante\_specification\_PGECOFST12-Rev00-CommercialDishwashers\_20151116”. |

**Measure Summary**

Table : Measure Summary Table

| **Section** | **Value** |
| --- | --- |
| **Summary & Purpose** | This short form work paper documents the inputs for the Energy Efficient Door-Type Commercial Dishwashers measure. The savings values are from PG&E’s workpaper PFECOFST126 R00 –Commercial Dishwasher document. Of the many types of commercial dishwashers available, including under-counter and conveyor-types, door-type units account for approximately 65% of the market share. This work paper addresses both low temperature and high temperature door-type dishwasher units. |
| **1.1 Measure & Baseline** | Please refer to Attachment #1 Calculation Templates for the list of measure solution codes and baseline condition. |
| **1.2 Technical Description** |  |
| **Measures** | FS-67513: Tier 1 - Energy Star Minimum Specification for Energy Efficient High Temperature Door-Type Commercial Dishwashers with water usage ≤0.89 gal/rack and idle energy rate ≤0.7 kW  FS-85137: Tier 2 - 15% below Energy Star Minimum Specification for Energy Efficient High Temperature Door-Type Commercial Dishwashers with water usage ≤0.76 gal/rack and idle energy rate ≤0.7 kW  FS-82265: Tier 1 - Energy Star Minimum Specification for Energy Efficient Low Temperature Door-Type Commercial Dishwashers with water usage ≤1.18 gal/rack (low temperate unit) and idle energy rate ≤ 0.60 kW  FS-54161: Tier 2 - 15% below Energy Star Minimum Specification for Energy Efficient Low Temperature Door-Type Commercial Dishwashers with water usage ≤1.00 gal/rack (low temperate unit) and idle energy rate ≤ 0.60 kW |
| **Code for All Measures** | No changes from PG&E workpaper.  This measure is not governed by either state or federal codes and standards.  The Energy Star Test Method for Commercial Dishwashers uses the ASTM F1696-07 Standard Test Method for Energy Performance Single-Rack, Door-Type Commercial Dishwashing Machines to estimate the energy and water consumption of both the base and measure case. |
| **Requirements** | No changes from PG&E workpaper.   * This measure includes new commercial low temperature or high temperature door-type dishwashers that meet the qualifications listed in Table 1 of PGECOFST126 Rev00. * Used or rebuilt equipment is not eligible. * Customers must provide proof that the appliance has the gallons per rack (gal/rack) and idle energy rate that meets the requirements. |
| **1.3 Installation Type and Delivery Mechanisms** |  |
| **Installation Type** | No changes from PG&E workpaper.  Replace on Burnout (ROB)  New Construction (NEW/NC) |
| **Delivery Mechanisms** | Down-Stream Incentive  Mid-Stream Incentive |
| **1.4.1 DEER Data** | No changes from PG&E workpaper. |
| **Net-Gross-Ratio** | All Com-Default<=2yrs |
| **Effective and Remaining Useful Life** | Appl-DW-DtU, EUL=15 years, RUL = 5 Years |
| **Section 2. Calculation Methodology** | No changes from PG&E workpaper. |
| **Energy savings/Peak Demand Reduction – All Measures** | The base case for this measure is determined by averaging field data collected from five different commercial food service sites and the minimum Energy Star commercial door-type dishwasher specification shown in Table 2 of PGECOFST126 Rev00. The measure case is an energy efficient (Energy Star 2.0) commercial door-type dishwashing machine shown in Table 3 of PGECOFST126 Rev00.  The demand estimation is based on estimated energy consumption savings divided over the peak demand hours of the unit. |
| **Section 3. Load Shapes** | No changes from PG&E workpaper.  DHW HtPmp  The load shape for commercial dishwashers differ among food service facilities. The load shape for this measure is based on the End-Use Water Demand Profile study conducted by the CPUC and Aquacraft. Please see Section 3 of PGECOFST126 Rev00 for more details. |
| **Section 4. Costs** | No changes from PG&E workpaper. |
| **Section 4.1 Base and Measure Costs** | Please refer to Attachment #1 Calculation Templates for detailed baseline and measure costs. Labor costs were not included since they cancel out for ROB and NC installations |

*No savings changes were required for this short form. The savings were simply transferred to SCE’s 2017 Calculation Template.*

**Savings Calculation Workbook**

**A1 SCE17CC016.0 Commercial Dishwashers\_Calc Template\_Final**