Work Paper SCE17CC007

**Revision 0**

**Short Form**

**Southern California Edison**

**Commercial Ice Machines**

**Introduction**

This short form workpaper documents (WP) the values adopted from PGE’s WP entitled “Commercial Ice Machines” (PGECOFST108 Rev6). SCE adopts all the values in PGECOFST108 Rev6 – “Commercial Ice Machines”, with the following changes:

* Mid-stream incentive method was added in this revision of the workpaper.
* SCE uses load shape DEER:Indoor\_Non-CFL\_Ltg
* PGE calculations are based on COM building type. SCE calculations were updated to reflect SCE Building types

# Document Revision History

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| --- | --- | --- | --- |
| **Rev** | **Date** | **Author** | **Summary of Changes** |
| 0 | 12/15/17 | Kara Vega (TRC) | * Transferred savings values to SCE Calculation template for the 2017 program year. * Mid-stream incentive method was added in this revision of the workpaper. * All 16 climate zones were used in this version. * The previously identified SCE solution codes were retired and new SCE solution codes were added to account for the new measure definitions identified in PGECOFST108 Rev6. |

**Measure Summary**

Table : Measure Summary Table

| **Section** | **Value** |
| --- | --- |
| **Summary & Purpose** | This short form work paper documents the inputs for a Commercial Ice Machine measure. The savings values are from PG&E’s workpaper PGECOFST108 R6 – Commercial Ice Machines document. Ice machines are installed and operated in a variety commercial building types, including office buildings, restaurants and bars, grocery and retail, laboratories and health care, lodging, schools, and amusement parks. Ranging from cube, to nugget and flake-type machines, together this installed base represents one of the largest classifications of commercial foodservice equipment. This workpaper addresses both cube type ice machines generating ice that weighs less than 60 grams (2 oz.) per piece, as well as flaked, crushed, or fragmented air-cooled ice machines. |
| **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-20160: Commercial Ice Machines SCU <110 lbs/day (PGE ID – FS014)  FS-20161: Commercial Ice Machines SCU 110-200 lbs/day (PGE ID – FS015)    FS-20162: Commercial Ice Machines SCU >200 lbs/day (PGE ID – FS016)    FS-20163: Commercial Ice Machines IMH <300 lbs/day (PGE ID – FS017)    FS-20164: Commercial Ice Machines IMH 300-800 lbs/day (PGE ID – FS018)    FS-20165: Commercial Ice Machines IMH 801-1500 lbs/day (PGE ID – FS019)    FS-20166: Commercial Ice Machines IMH > 1500 lbs/day (PGE ID – FS020)  FS-20167: Commercial Ice Machines RCU <988 lbs/day (PGE ID – FS021)    FS-20168: Commercial Ice Machines RCU ≥ 988 lbs/day (PGE ID – FS022) |
| **Code for All Measures** | No changes from PG&E workpaper.  This measure falls under Title 20 of the California Energy Regulations. Under this regulation, the following is required: all commercial ice machines manufactured on or after January 28, 2018 are required to meet the specifications outlined in the Tables 6 and 7 of PGECOFST108 R6.  This measure does not fall under Title 24 of the California Energy Regulations.  DOE has updated federal commercial ice machine regulations in January 2018 which align with California Title 20.  AHRI Standard 810, Performance Rating of Automatic Commercial Ice-Makers, is considered the industry standard for estimating commercial ice machine energy use. The AHRI test data was used to estimate the energy consumption of the base case and measure equipment. AHRI 810 references ASHRAE 29 Standard for test condition details. |
| **Requirements** | No changes from PG&E workpaper.   * Only air-cooled machines (self-contained, icemaker heads, or remote condensing) are eligible; water-cooled ice machines are excluded. To qualify, the entire AHRI tested Ice Making system must be purchased. Remote machines must be purchased with qualifying remote condenser or remote condenser/compressor unit. * This measure includes new commercial ice machines that meet the requirements listed in Table 1 (batch machines) and Table 2 (continuous machines) of PGECOFST108 Rev6. * Used or rebuilt equipment is not eligible. * Customers must provide proof that the appliance meets the energy efficiency specifications listed in Table 1 (batch machines) and Table 2 (continuous machines) of PGECOFST108 Rev6. |
| **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** | Financial Support: Down-Stream Incentive - Deemed  Mid-Stream Programs: Mid-Stream Incentive |
| **1.4.1 DEER Data** | No changes from PG&E workpaper. |
| **Net-Gross-Ratio** | Com Default>2 yrs |
| **Effective and Remaining Useful Life** | Cook-IceMach, EUL=10 years, RUL = 3.3 Years |
| **Section 2. Calculation Methodology** | No changes from PG&E workpaper. |
| **Energy savings/Peak Demand Reduction – All Measures** | The base case is based on the California Energy Commission (CEC) Title 20 regulations for commercial ice machines. Measure case requirements were taken from ENERGY STAR V3.0 Program Requirements for Automatic Commercial Ice Makers which became effective on January 28, 2018 to reflect concurrent DOE regulations.  The demand reduction estimation is based on AHRI reported data for standard efficiency ice machines and for high-efficiency ice machines. The measured data are derived from tests conducted under AHRI Standard 810. The estimated demand reduction was based on the average demand for baseline and energy efficient model ice machines.  Energy savings and demand reduction are based on the difference between baseline ice machines of the same size that meet Title 20 code and energy efficient machines that meet ENERGY STAR V3.0 program requirements.  Ice machines are divided into batch and continuous categories. The ENERGY STAR category thresholds differ for each type. Table 10 of PGECOFST108 Rev6 show which size categories for continuous ice machines match the size categories for batch ice machines. The energy savings for each measure code were averaged for the batch energy savings and corresponding continuous ice machine savings. A similar approach was used for the demand reduction. Please refer to Table 11 of PGECOFST108 Rev6 for the weighted average demand reduction per measure code. |
| **Section 3. Load Shapes** | DEER:Indoor\_Non-CFL\_Ltg  The load shape for commercial ice machines differ among food service facilities. The measure load shape for this measure is determined by CET based on the applicable nonresidential market sector and the foodservice end-use. Please see Section 3 of PGECOFST108 Rev6 for additional 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. |

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

**Attachments**

1. SCE17CC007.0 A1 Calculation Template