Short Form Work Paper WPSDGENRRN0016

**Revision 0**

**San Diego Gas & Electric**

**Energy Efficiency Engineering**

**High Efficiency Ultra-Low Temperature (ULT, -80C) Freezers**

**September 25, 2017**

# High Efficiency Ultra-Low Temperature Freezer Short Form WP

## Introduction

This short form workpaper (WP) documents the values adopted from PGE’s workpaper entitled “High Efficiency Ultra-Low Temperature Freezers” (PGECOREF130 Rev 0). SDG&E adopts the values associated with our climate zone as stated in PGECOREF130 Rev 0. No exceptions taken.

## Document Revision History

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| --- | --- | --- | --- |
| **Rev** | **Date** | **Author** | **Summary of Changes** |
| 0 | 10/05/17 | Joshua Williams,  Ed Reynoso /  SDG&E | Adapted from PGE Work Paper PGECOREF130 Revision #0 dated August 7, 2017, developed by Yin Yin Wu, PE (BASE Energy, Inc), Danielle Dragon PE (PG&E), and Zyg Kunczynski (PG&E). SDGE will only be adopting (and providing Ex-ante data) measure impacts for SDG&E service territory which are CZ06, CZ07, CZ08, CZ10, CZ14 and CZ15. |

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Table 1: Measure Summary Table

|  |  |
| --- | --- |
| **Section** | **Value** |
| **1.1 Measure & Baseline Data (Cited per PGE Workpaper as stated in Document Revision History)** |  |
| **1.2 Technical Description** | As documented in the ET Study, ULT freezers with temperature set points generally ranging from -56oC to -86oC entered the marketplace in the 1970s. In the past two decades, temperature set points of ULT freezers have generally fallen close to -80oC with an average temperature of -77.5oC (Section 1.8.3). These freezers are commonly called “minus eighties” and are used in a wide range of life science research laboratories to maintain the integrity of samples and reagents for long periods of time. As recommended in the ET study, to be conservative the temperature set point for energy savings calculations is -75oC. |
| Measure 1  Measure 2 | |  |  |  | | --- | --- | --- | | Measure Code | | Measure Names | | SDGE | PGE | | 464028  464029 | RF006 | ULTRA-LOW TEMPERATURE FREEZER, 15 TO 23 CUBIC FEET | | 464030  464031 | RF007 | ULTRA-LOW TEMPERATURE FREEZER, >= 24 CUBIC FEET | |
| Code for Measure  **(Cited per PGE Workpaper as stated in Document Revision History)** | There is no code or other jurisdictional requirements related to these measures. |
| Requirements | The measure type is Replace on Burnout or New Construction (ROBNC). A qualifying product must have the following:   * Upright ULT freezer designed for laboratory application that is capable of maintaining set point storage temperatures between -70 °C and -80 °C (-94 °F and -112 °F) * ENERGY STAR® certification * 15 ft3 < Volume ≤ 29 ft3 |
| **1.3 Installation Type and Delivery Mechanisms** |  |
| Installation Type | Replace on Burnout or New Construction (ROB/NC) |
| Delivery Mechanism | Downstream Rebate – Deemed  Direct Install – Deemed  NOTE: Measures are offered in the SDG&E Business Energy Solutions is a Direct Install program yet require a customer co-pay and are treated as downstream deemed. |
| **1.4.1 DEER Data** |  |
| DEER Measure ID | DEER does not contain this type of measure. |
| Net-to-Gross Ratio | ET-Default: 0.85 |
| Effective and Remaining Useful Life  **(Cited per PGE Workpaper as stated in Document Revision History)** | EUL\_ID / RUL\_ID : GrocDisp-FixtDoors = 12 / 4 years |
| **Section 2. Calculation Methodology**  **(Cited per PGE Workpaper as stated in Document Revision History)** |  |
| **Units** | As cited per PGE workpaper PGECOREF130 Rev 0 and not exceptions taken. |
| **Section 3. Load Shapes** | Building Types and Load Shapes   |  |  |  | | --- | --- | --- | | **Building Type** | **Load Shape** | **E3 Alternate Building Type** | | Education - University |  | COMMERCIAL | | Health/Medical - Hospital |  | COMMERCIAL | | Health/Medical – Nursing NursHospital |  | COMMERCIAL | | Manufacturing Biotech |  | INDUSTRIAL | | Manufacturing Pharmaceutical |  | INDUSTRIAL |     DEER building Types: EUn, Hsp, MBT, MLI, and Nrs  ElecImpProfile: SDGE:RES:DEER:RefgFrzr\_HighEff |
| **Section 4. Costs** |  |
| Units | Per Controller (each) |
| Base Cost – Measure 4 | |  |  |  |  | | --- | --- | --- | --- | | **Measure Code** | | **Base Description Cost** | | | **PGE** | **SDGE** | **ULT Freezer Size** | **Average Retail Price** | | RF006 | 464028  464029 | 15 to <24 ft3 | $8,849 | | RF007 | 464030  464031 | 24-29 ft3 | $10,670 | |  | | | | |
| Measure Cost – Measure 4 | |  |  |  |  | | --- | --- | --- | --- | | **Measure Code** | | **Measure Description Cost** | | | **PGE** | **SDGE** | **ULT Freezer Size** | **Average Retail Price** | | RF006 | 464028  464029 | 15 to <24 ft3 | $10,984 | | RF007 | 464030  464031 | 24-29 ft3 | $12,460 | |  | | | | |
| Incremental Cost – Measure 4 | Full and Incremental Costs (15 to 24ft3)   |  |  |  |  | | --- | --- | --- | --- | | **Installation Type** | **Incremental Measure Cost** | **Full Measure Cost** | | | **1st Baseline** | **2nd Baseline** | | RO/BNC | $2,135 | N/A | N/A |   Full and Incremental Costs (24-29 ft3)   |  |  |  |  | | --- | --- | --- | --- | | **Installation Type** | **Incremental Measure Cost** | **Full Measure Cost** | | | **1st Baseline** | **2nd Baseline** | | ROB/NC | $1,790 | N/A | N/A | |