Short Form Work Paper WPSDGENRCC0014

**Revision 4**

**San Diego Gas & Electric**

**Energy Efficiency Engineering**

**Commercial Fryer-Electric and Gas**

**December 20, 2016**

# SDG&E Commercial Fryer-Electric and Gas

## Introduction

This short form workpaper documents (WP) the values adopted from PGE’s WP entitled “Commercial Fryer-Electric and Gas” (PGECOFST102 R6 Commercial Fryers 052416-MD)). SDG&E adopts all of the values in PGECOFST102 R6 Commercial Fryers 052416-MD, with the following exceptions:

1. SDG&E use different measure sizes, which creates four implementations versus PGE’s two.

## Document Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Rev** | **Date** | **Author** | **Summary of Changes** |
| 0 | 12/11/2007 | David Zabrowski | Original work paper: Commercial Large Vat Fryers PGECOFST114 R0.doc |
| 1 | 07/17/2010 | Lucie Sidibe/SDG&E | Adopted from PGECOFST114, Revision 2\*refer to attachment for original work paper Summary of changes:  1-Work Paper run ID was changed to mirror SDGE cataloging needs. |
| 2 | 06/15/2012 | Max Twogood/SDG&E | Adopted from: Commercial Large Vat Fryer PGECOFST114 R3-revised May 15 2012.doc dated April 26, 2012. Revised NTRG to 2011 DEER. Revised approvers to SDGE management. This WP will replace WPSDGENRCC0014 |
| 3 | 05/09/2014 | Peter Ford/SDG&E | Combined WPSDGENRCC0003 Rev 2 and WPSDDGENRCC0014 Rev 3 to a single Fryer WP by adopting PGECOFST102 Rev 4, Commercial Fryer-Electric and Gas, dtd 22 August 2012. Changed codes to reflect SDG&E rebate catalog. Updated qualified products to those contained on Fisher-Nickel site (as of 4/16/13), including descriptions. |
| 3.1 | 06/20/2014 | Judelson Enriquez/ RMS Energy Consulting, LLC | INTERNAL REVISION ONLY – no material impact made  1. Updated to new template.  2. Generated calculation spreadsheet based on IOU statewide Calculation Template, with additional columns for Mark M. and removed CZ cost factors. |
| 4 | 11/23/16 | Kelvin Valenzuela/SDG&E | Updated SDG&E’s Product Codes with adoption of PGE’s PGECOFST102 R6 Commercial Fryers 052416-MD.docx. |

## Measure Summary

Table : Measure Summary Table

| **Section** | **Value** |
| --- | --- |
| **Summary & Purpose** | This short form workpaper documents ex-ante load impacts and cost-effectiveness values for Commercial Fryers both electric and gas. The base energy consumption and measure energy consumption values are from PG&E’s workpaper, PGECOFST102, Revision 6. Since SDG&E’s measure offering is different than that of PG&E, SDG&E’s product codes are substituted to create a total of 4 separate offerings versus the 2 with PG&E. |
| **1.1 Measure & Baseline Data** | Measure:  402004 – Electric Fryer (vat width < 18-inches)  402006 – Large Electric Fryer (vat width ≥ 18-inches)  402005 – Gas Fryer (vat width < 18-inches)  402007 – Large Gas Fryer (vat width ≥ 18-inches) |
| **1.2 Technical Description** |  |
| Measures | See Requirements |
| Code for All Measures | **California Title 20**  State of California Title 20 Appliance Efficiency Regulation6 has a category for cooking appliances, but fryers are not included.  **California Title 24**  There are no State of California Title 24 Efficiency Regulation requirements for commercial fryers.  **Federal**  There are no Federal energy efficiency requirements for commercial fryers.  **American Society for Testing and Materials (ASTM) Standards**  ASTM Standard Test Method for the Performance of Open Deep Fat Fryers (F1361) and Large Vat Fryer (2144) are applicable for estimating energy use and cooking performance. They are used to estimate the energy consumption of the base case and measure equipment. |
| Requirements | The commercial electric fryer (vat width < 18 inches) must meet ENERGY STAR®1 Version 2.0 specification for energy efficiency or must have a tested heavy load cooking energy efficiency of 80% and an idle energy rate less than or equal to 1,000 W, utilizing ASTM Standard F1361.  The commercial electric large vat fryer (vat width ≥ 18 inches) must meet ENERGY STAR® Version 2.0 specification for energy efficiency or must have a tested heavy load cooking energy efficiency of 80% and an idle energy rate less than or equal to 1,100 W, utilizing ASTM Standard F2144. Multiple vat configurations are paid per qualifying vat.  The commercial gas fryer (vat width < 18 inches) must meet ENERGY STAR® Version 2.0 specification for energy efficiency or must have a tested heavy load cooking energy efficiency of 50% and an idle energy rate less than or equal to 9,000 Btu/h, utilizing ASTM Standard F1361.  The commercial gas large vat fryer (vat width ≥ 18 inches) must meet ENERGY STAR® Version 2.0 specification for energy efficiency or must have a tested heavy load cooking energy efficiency of 80% and an idle energy rate less than or equal to 12,000 Btu/h, utilizing ASTM Standard F2144. Multiple vat configurations are paid per qualifying vat. |
| **1.3 Installation Type and Delivery Mechanisms** |  |
| Installation Type | Replace on Burn-out (ROB) |
| Delivery Mechanisms | Downstream Rebate – Deemed  NOTE: Measures are offered in the SDG&E Direct Install program yet require a customer co-pay and are treated as downstream deemed. |
| **1.4.1 DEER Data** |  |
| Net-to-Gross Ratio | Com-Default>2yrs |
| Effective and Remaining Useful Life | Cook-ElecFryer  Cook-GasFryer |
| **Section 2. Calculation Methodology** | DEER 2016 |
| Energy Savings/Peak Demand Reduction – All Measures | **Electric Fryer & Large Electric Fryer (PG&E: F205) (SDG&E: 402004 & 402006)**  Base Case Energy Consumption: Source: PG&E Calculations – 18,079 kWh/yr; 3.5 kW  Measure Energy Consumption: Source: PG&E Calculations – 15,103 kWh/yr; 3.0 kW  Energy Savings (Base Case – Measure): Source: PG&E Calculations – 2,976 x 0.70 = 2,083 kWh/yr; 0.50 kW x 0.90 (CDF) x 0.70 = 0.315 kW  **Gas Fryer & Large Gas Fryer (PG&E: F206) (SDG&E: 402005 & 402007)**  Base Case Energy Consumption: Source: PG&E Calculations – 1,657 therms/yr  Measure Energy Consumption: Source: PG&E Calculations – 874 therms/yr  Energy Savings (Base Case – Measure): Source: PG&E Calculations – 783 therms/yr x 0.70 = 548 therms/yr |
| **Section 3. Load Shapes** | SDG:35-OTI-OtherIndustrial-PROC\_OTH  WinterOnly |
| **Section 4. Costs** |  |
| **Section 4.1 Base and Measure Costs** |  |
| Base Cost |  |
| 402004/402006 | $4,108 (PG&E F205) |
| 402005/402007 | $3,367 (PG&E F206) |
| Measure Cost |  |
| 402270/402273 | $4,876 (PG&E F205) |
| 402271/402274 | $4,384 (PG&E F206) |

## Differences From Lead Program Administrator Workpaper

Although the savings calculations and costs are the same with the adoption of PG&E’s workpaper, the offerings slightly differ. The lead PA offers only 2 product codes, F205 and F206 to account for both regular and large electric and gas fryers whereas, SDG&E breaks out the regular and large offerings of each source. SDG&E’s screenshot down below helps visualize the four offerings.

