Short Form Work Paper PGECOPRO110

**Revision 2**

**Pacific Gas and Electric**

**Customer Energy Solutions**

**Process Fan VSD**

**June 21, 2017**

# PG&E Process Fan VSD

## Introduction

This short form workpaper documents the ex-ante load impact and cost-effectiveness values used for Process Fan Variable Speed Drive (VSD). All of the units have been normalized per horsepower as cited by “SCE17PR008 Rev 1 Process Fan VSD” workpaper.

## Document Revision History

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| --- | --- | --- | --- |
| **Rev** | **Date** | **Author** | **Summary of Changes** |
| 0 | 3/31/2015 | Jia Huang (PG&E) | * Adopted SCE workpaper SCE13PR008 |
| 1 | 4/22/2016 | Jia Huang (PG&E) | * Ex ante template update |
| 2 | 6/21/2017 | Jia Huang (PG&E) | * Adopted lead IOU workpaper “SCE17PR008.1 Process Fan VFD\_Final.docx” with all its assumptions and values. |

## Measure Summary

Table 1: Measure Summary Table

| **Section** | **Value** |
| --- | --- |
| **Summary & Purpose** | This short form workpaper documents ex-ante load impacts and cost-effectiveness values for Process Fan VSD for non-HVAC fans. The energy savings and load impacts are based on the lead IOU workpaper “SCE17PR008 Rev1 – Process Fan VFD” associated SCE measure code “PR-19148” (Greater than 5 HP to 75 HP Variable Speed Drive on Process Fan Control). |
| **1.1 Measure & Baseline Data** | Measure: Variable speed drive (VSD) on an existing process fan.  Baseline: Process fan with rated motor capacity ≤ 75 hp. |
| **1.2 Technical Description** | Per cited per SCE17PR008.1 workpaper |
| Measures | |  |  |  | | --- | --- | --- | | Measure Code | | Measure Name | | SCE | PG&E | | PR-19148 | PR002 | Greater than 5 HP to 75 HP Variable Speed Drive on Process Fan Control | |  | | | |
| Code for All Measures | As cited per “SCE17PR008.1 Process Fan VSD” lead IOU workpaper with no exceptions and summarized below:   * Title 24 (2016), Section 120.6 [496] provides mandatory requirements for covered processes. * 120.6(e) provides requirements for air compressor systems, but air compressor systems are not covered in this work paper. |
| Requirements | As cited per SCE17PR008.0 Process Fan VSD workpaper:  The existing fan shall meet the following requirements:   * Must not be a HVAC or refrigeration fan. * May be used for exhaust, ventilation, pressurization, or other process applications. Air compressor systems are not eligible. * Must have a motor horsepower rating ≥ 3 hp and ≤ 75 hp because savings for motors below 3 hp are minimal and do not justify the cost of a VSD retrofit. * Must operate continuously or be manually operated with an ON/OFF control switch. Two-speed fans do not qualify.   This measure is applicable only to the following building types:   * Manufacturing - Bio/Tech * Manufacturing - Light Industrial |
| **1.3 Installation Type and Delivery Mechanisms** |  |
| Installation Type | * Retrofit Add-on (REA) |
| Delivery Mechanisms | * Downstream Rebate – Deemed Rebate * Direct Install |
| **1.4.1 DEER Data** | As cited per “SCE17PR008.1 Process Fan VSD” lead IOU workpaper |
| Net-to-Gross Ratio | Ind-Default>2yrs  All other EEMs with no evaluated NTGR; existing EEM in programs with same delivery mechanism for more than 2 years |
| GSIA | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | GSIA | Description | Sector | BldgType | ProgDelivID | GSIAValue | | Def-GSIA | Default GSIA | Any | Any | Any | 1 | |
| Effective and Remaining Useful Life | |  |  |  |  | | --- | --- | --- | --- | | EUL ID | Description | Sector | UseCategory | | ProcDist-Motor\_Spd | Variable Speed Drive on Process Fan Control | Com | Process | |
| **Section 2. Calculation Methodology** |  |
| Energy Savings/Peak Demand Reduction – All Measures | All Energy Impacts per “SCE17PR008 Rev1 Process Fan VSD” workpaper.  Annual Energy Savings and Demand Reduction Values   |  |  |  |  | | --- | --- | --- | --- | | Solution Code | | Annual Energy Savings (KWh/HP/Yr) | DEER Peak Demand (KW/HP) | | SCE | PG&E | | PR-19148 | PR002 | 597.83 | 0.34478 | |
| **Section 3. Load Shapes** | PGE:INDUSTRIAL:11 = Industrial Process |
| **Section 4. Costs** | All cost adopted and cited from “SCE17PR008 Rev1 –Process Fan VSD” SCE workpaper. |
| **Section 4.1 Modeled Costs** | All cost have been normalized per “SCE17PR008.1 Process Fan VSD” workpaper to reflect “$/HP” |
| Base Cost – Measure1 | $0.00  For this measure category, the base case cost is assumed to be zero given that the alternative is to make no changes to their existing system. |
| Measure Cost – Measure 1 | |  |  |  |  |  | | --- | --- | --- | --- | --- | | Product Code | | Labor Cost ($/HP) | Material Cost ($/HP | Measure Cost ($/HP) | | SCE | PG&E | | PR-19148 | PR002 | 38.29 | 184.71 | 223.00 | |