Short Form Work Paper PGECOHVC167

**Revision 2**

**Pacific Gas & Electric Company**

**Energy Efficiency Engineering**

**Residential Smart Communicating Thermostat**

**October 2, 2019**

# Residential Smart Communicating Thermostat Short Form WP

## Introduction

This short form workpaper documents the adoption of the latest version of SCE Workpaper SCE17HC054 Revision 1 by PG&E. All SCE parameters are adopted and are as shown in this table with one exception to Building HVAC Type.

## Document Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Rev** | **Date** | **Author** | **Summary of Changes** |
| 0 | 2/17/2017 | SCE/NEST Collaboration:  Jeff Gleeson (Nest), Aaron Berndt (Nest),  Andres Fergadiotti (SCE) | New work paper, first version |
| 1 | 10/27/2017 | Henry Liu (PG&E) | Add CZ14 with gas savings only from the SCE approved workpaper SCE17HC054.0 |
| 2.0 | 10/2/2019 | Collin Smith, SDG&E | * New calculation template for 2019 program year * Baseline technologies updated based on PG&E’s Smart Thermostat Program Process Evaluation * Updated technical description and code sections * Updated installation type to include only Normal Replacement (NR) * Net-to-gross ratio updated based on PG&E’s Smart Thermostat Program Process Evaluation * Effective useful life (EUL) updated based on SCE’s 2019 “EUL Analysis of Residential Smart Communicating Thermostat—Vendor A and B” study * Calculation methodology and savings updated based on PGE’s 2018 Smart Thermostat Study (Year 1). * IMC updated to reflect 2019 cost analysis. * Added measure savings estimates for technology controlling Heat Pump equipment * Electric cooling savings adjusted using DEER-Weighted Tstat Schedules. * Electric heating savings removed for the heat pump measure. * For MFM (multi-family), the adjustment (scaling) factor was improved using System Capacity (ton) documentation from Programs. * Added Sections 1.6.2 Heat Pump Heating (Electric) Savings, 1.6.3 DEER2020 Peak Demand Reduction, and 1.6.4 Effective Useful Life under Future Data Needs * Changed Building HVAC Type for Heat Pumps from cDXHP to rDXHP. |

## Measure Summary

Table 1: Measure Summary Table

| **Section** | **Value** |
| --- | --- |
| **Summary & Purpose** | This short form workpaper documents the adoption of the latest version of SCE Workpaper SCE17HC054 Revision 1 by PG&E. All SCE parameters are adopted and are as shown in this table with one exception to Building HVAC Type, which was changed from cDXHP to rDXHP. |
| **1.1 Measure & Baseline Data** | Measure:  PG&E:  HV396 - Residential Smart Thermostat  HV397 - Residential Smart Thermostat Heat Pump  Please reference PGECOHVC167-R2 EAD Data Tables.xlsx for additional implementation ID information  Measure and Baseline changes are documented in the SCE WP. Herein, the measure is an NR measure type installation of a Smart Thermostat with two-way communication and automatic scheduling. The base case is existing installations of setback programmable thermostats and non-programmable thermostats. |
| **1.2 Technical Description** | NR measure for a Smart Communication Thermostat installed as a retrofit to an existing setback programmable or non-programmable thermostat serving an existing residential HVAC unit. |
| Measure 1 | No changes from Rev 1 |
| Code for Measure 1 | No changes from Rev 1 |
| **1.3 Installation Type and Delivery Mechanisms** | |
| Installation Type | Normal Replacement (NR) |
| Delivery Mechanisms | * Financial Support - Downstream Incentive – Deemed * Financial Support – Direct Install |
| **1.4.1 DEER Data** | |
| DEER Measure ID | No Changes from REV 1 |
| Net-to-Gross Ratio | No Changes from REV 1 |
| Effective and Remaining Useful Life | HV-ProgTstat; EUL = 9.1 years (Non-DEER) |
| **Section 2. Calculation Methodology** | |
| Energy Savings/Peak Demand Reduction Measure 1 | Various per Climate Zone (See PGECOHVC167-R2 EAD Data Tables) |
| **Section 3. Load Shapes** | RES; DEER:HVAC\_Eff\_AC; Annual  RES; DEER:HVAC\_Eff\_HP; Annual |
| **Section 4. Costs** | |
| Base Cost – Measure 1 | Weighted Baseline Material Cost: $40.59  Baseline Labor Cost: $26.26  Baseline Total Cost: $66.85 each Per SCE WP SCE17HC054 Revision 1 |
| Measure Cost – Measure 1 | Measure Case Material Cost: $183.05  Measure Case Labor Cost: $26.26  Measure Case Total Cost: $209.31 each Per SCE WP SCE17HC054 Revision 1 |
| IMC – Measure 1 | Incremental Measure Cost: $142.46 each Per SCE WP SCE17HC054 Revision 1 |