Short Form Work Paper WPSDGEREHC0030

**Revision 0**

**San Diego Gas & Electric**

**Energy Efficiency Engineering**

**Residential Smart Communicating Thermostat**

**June 29, 2017**

# Residential Smart Communicating Thermostat Short Form WP

## Introduction

This short form workpaper documents the values adopted from SCE’s workpaper entitled “Residential Smart Communicating Thermostat” (SCE17HC054 Rev 0). SDG&E adopts all of the values in SCE13HC0054 Rev 0 with no exceptions.

## Document Revision History

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| --- | --- | --- | --- |
| **Rev** | **Date** | **Author** | **Summary of Changes** |
| 0 | 06/29/2017 | Kelvin Valenzuela, SDG&E | Adopted from SCE, SCE17HC054.0 Residential Smart Communicating Thermostat\_Final.docx |
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## Measure Summary

Table 1: Measure Summary Table

| **Section** | **Value** |
| --- | --- |
| **Summary & Purpose** | This work paper documents the values adopted from SCE’s workpaper entitled “Residential Smart Communicating Thermostat” (SCE17HC054 Rev 0). SDG&E adopts their workpaper having no changes from the original SCE workpaper. |
| **1.1 Measure & Baseline Data** | This short form workpaper summarizes the installation of a Residential Smart Thermostat. This measure characterizes the household heating and cooling energy savings from the installation of a Smart Thermostat. Smart Thermostats reduce energy consumption using a combination of features described in Section 1.2 Technical Description.  The calculation approach utilized in this short form workpaper ensures the range in energy savings (both increases and decreases) associated with smart thermostat installations are captured and studied in the analysis and therefore the results create the average net savings by climate zone.  **General Eligibility Requirements**[[1]](#footnote-1)   1. PA shall employ QA/QC procedures to ensure that the thermostat is installed in an eligible home and is attached to the type of HVAC equipment that is being incentivized, whether it is for natural gas or electricity savings. 2. PA shall confirm that the customer has a newly purchased smart thermostat. At minimum, the PA shall obtain a copy of the thermostat sales receipt and the PA shall confirm the purchase date is on or after the program’s start date. 3. Customer eligibility shall be determined by each PA prior to paying rebates. Upon request, all data associated with determining eligibility shall be provided to Energy Division. PAs shall extend this requirement to any third party vendors in who assist PAs with determining customer eligibility. To the extent that they are used to determine eligibility, data regarding dates of purchase, location of home, customer HVAC equipment type, pre-installation HVAC energy use, and etcetera shall be made available.   **Device Eligibility Requirements**:   * A qualified Wi-Fi thermostat per guidelines described below in Section 1.2   **Customer Eligibility Requirements:**   * Customer segment: residential * Must use the thermostat to control heating and/or cooling equipment supplied by fuels provided by the utility paying the end-customer incentive   + For single-fuel utilities (or dual-fuel utilities in a portion of their service area where they only supply one fuel), only savings for the applicable delivered fuel may be claimed   + Eligible heating equipment: gas forced-air furnace, electric forced-air furnace, heat pump   + Eligible cooling equipment: central air conditioning |
| **1.1 Measure & Baseline Data (cont.)** | **Program Design Options:**   1. **Downstream energy efficiency rebate (no demand response):**     * Customer must purchase and install a qualifying product in order to receive an energy efficiency (EE) rebate    * Customer who purchase qualifying equipment, but choose not to join a demand response (DR) program, can still receive a rebate.    * *Applicable utilities: SDG&E, SCE, SoCal Gas and PG&E.* 2. **Downstream energy efficiency rebate with Demand Response rebate (or incentive) to encourage IDSM:**     * Customer must purchase and install a qualifying product in order to receive the energy efficiency (EE) rebate    * Additional Demand Response (DR) rebate or incentive can be provided to the customer if they choose to enroll in a DR program after installing their new device.    * Some customers will only redeem the EE rebate. A portion of customers will redeem both the EE and DR.   *Applicable utilities: SDG&E, SCE, SoCal Gas and PG&E.* |
| **1.2 Technical Description** | A **Smart Thermostat** is a device that controls heating, ventilation, and air-conditioning (HVAC) equipment to regulate the temperature of the room or space in which it is installed, has the ability to make automated adjustments to the set point of the HVAC system to drive energy savings (electric and gas), and has the ability to communicate with sources external to the HVAC system. For connection, the Smart Thermostat may rely on a home area network (e.g. Wi-Fi) and an internet connection that is independent of the Smart Thermostat.  Smart thermostats are enhanced by data gathering and analytics functionalities, which enables them to use a variety of methods to optimize HVAC settings for efficient and automated energy consumption. Specifically, a smart thermostat is defined as a thermostat that is compatible with the participant’s HVAC system, and has   * Two-way communication, * Occupancy detection (through the use of occupancy sensors, geofencing, etc.), and;   At least two of the features in following:   * **Schedule learning** - Thermostat learns occupant patterns with little to no effort from the customer. * **Heat pump auxiliary heat optimization** - Thermostat optimizes the use of the refrigerant heating cycle in preference to auxiliary heat, while still enabling the home to achieve a comfortable set point. * **Upstaging / downstaging optimization** - Thermostat optimizes the use of the lowest and most efficient stage of heating or cooling in preference of the higher capacity stage, while still enabling the home to achieve a comfortable set point. * **Humidity control** - Thermostat uses a humidity sensor to optimize HVAC operation. * **Weather-enabled optimization** - Thermostat uses weather predictions and weather data to optimize the HVAC system. * **Free cooling / economizer capability** - Thermostat recognizes the indoor/outdoor temperature difference and uses the outside air instead of the air conditioner or heating system to cool or heat the home when possible. |
| Measure 1 | Residential Smart Communicating Thermostat has two-way communication and automatic scheduling capabilities |
| Code for Measure 1 | Setback Programmable Thermostats or Non-Programmable Thermostats |
| **1.3 Installation Type and Delivery Mechanisms** |  |
| Installation Type | * Replace On Burnout (ROB) or Early Replacement (ER) |
| Delivery Mechanisms | * Financial Support - Downstream Incentive – Deemed * Financial Support – Direct Install |
| **1.4.1 DEER Data** |  |
| DEER Measure ID | DEER does not contain this type of measure. |
| Net-to-Gross Ratio | Res-Default>2 SDG&E will use the Default NTG |
| Effective and Remaining Useful Life | HV-ProgStats ; EUL = 11 years |
| **Section 2. Calculation Methodology** |  |
| Energy Savings/Peak Demand Reduction Measure 2 | Various per Climate Zone (See 20170629 WPSDGEREHC0030-Rev00 Data Tables) |
| **Section 3. Load Shapes** | SDGE:DEER:HVAC\_Eff\_AC; Annual |
| **Section 4. Costs** | There are no CostIDs for these measures in READI. SDG&E took the lowest cost from the 5 climate zones in SDG&E’s territory based on SCE’s workpaper. |
| DEER/READI Base CostID | WPSDGENRHC0030-Rev00-Msr001-FULL; $162.25  WPSDGENRHC0030-Rev00-Msr001-BASE; $81.88 |

1. Items in Disposition for WPSCGREHC160624A (SCG Smart Thermostat) issued November 8, 2016 That Impact Future Smart Thermostat Workpapers [↑](#footnote-ref-1)