Short Form Work Paper WPSDGEREWH0024

**Revision 2**

**San Diego Gas & Electric**

**Energy Efficiency Engineering**

**Storage Tank Water Heaters**

**February 27, 2019**

## Introduction

This short form workpaper documents the ex-ante load impact and cost-effectiveness values used for Natural Gas Storage Tank Water Heaters.

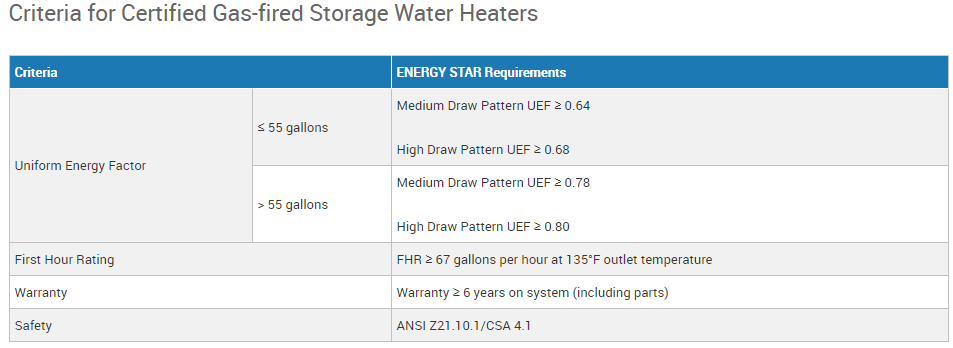
## Document Revision History

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| --- | --- | --- | --- |
| Revision # | MM/DD/YY | Author/Affiliation | Summary of Changes |
| 0 | 12/28/2017 | Joshua Williams (SDGE) | * Created new workpaper ID for latest workpaper update. WPSDGEWH0024 Rev 0 * SDG&E establishes this Short Form Work Paper to coincided with the DEER 2017 update for Residential - Storage Tank Water Heaters. * All measures values included in this workpaper are taken directly from the DEER 2017 READI Tool or were created using the READI Tool. * The 2017 Database for Energy Efficient Resources (DEER2017) v2.4.7 [3] data include: gas energy savings, measure cost, equipment useful life, and net-to-gross for this measure. |
| 1 | 12/26/2018 | Kelvin Valenzuela (SDGE) | * Updated workpaper to incorporate EF to UEF DEER IDs, which will be implemented 1/1/18. * Cost values were adopted from SCG’s WPSCGREWH180207A-Rev00 * Update also includes 2018 and 2019 Measure Application Types and Delivery Types. * Updated electric profile |
| 2 | 02/27/2019 | Eduardo Reynoso (SDG&E) | * Updated workpaper and ex-ante data base for adopting DEER gas storage tank water heater MeasuresIDs that are based on the latest 2019 DEER Water Heating calculator with a start date of 1/1/2019. * This update is in response to CPUC Disposition dated 2/6/2019 issued by Peter Biermayer, titled “Non-standard Disposition for Submittal of P1 2019 Residential and Small Commercial Water Heaters”. |

Eligibility Requirements

* Must be meet Energy Star Certified Criteria for Certified Gas-fired Storage Water Heaters below and listed on Energy Star website.

(<https://www.energystar.gov/productfinder/advanced> )



* All storage water heating units must meet or exceed the Unified Energy Factor (UEF) values described in the following measure summary table to participate in the EE program.

**Measure Summary Table**

|  |  |  |
| --- | --- | --- |
| ***DEER Measure ID*** | ***Measure Description*** | ***Baseline Description*** |
| RG-WtrHt-SmlStrg-Gas-Ite75kBtuh-40G-HI-0p68UEF | 40 Gallon High Draw water heater with a rating of ≥0.68 UEF; Savings Converted into Cap-kBTUh | High Draw 40 Gallon Gas Storage Water heater with a rating ≥ 0.64 UEF |
| RG-WtrHt-SmlStrg-Gas-Ite75kBtuh-40G-MD-0p64UEF | 40 Gallon Medium Draw water heater with a rating of ≥0.64 UEF; Savings Converted into Cap-kBTUh | Medium Draw 40 Gallon Gas Storage Water heater with a rating ≥ 0.58 UEF |
| RG-WtrHt-SmlStrg-Gas-Ite75kBtuh-50G-HI-0p68UEF | 50 Gallon High Draw water heater with a rating of ≥0.68 UEF; Savings Converted into Cap-kBTUh | High Draw 50 Gallon Gas Storage Water heater with a rating ≥ 0.63 UEF |
| RG-WtrHt-SmlStrg-Gas-Ite75kBtuh-50G-MD-0p64UEF | 50 Gallon Medium Draw water heater with a rating of ≥0.64 UEF; Savings Converted into Cap-kBTUh | Medium Draw 50 Gallon Gas Storage Water heater with a rating ≥ 0.56 UEF |

* + 1. Implementation Requirements
       1. The rebate applies to gas-for-gas equipment replacements on normal replacement (or burnout) to new installations.
       2. This measure is applicable to any residential domestic (or “service”) hot water application.
       3. This Workpaper does not cover water heaters used for space conditioning, process end-use applications, pools, or spas.
       4. This measure includes replacing a storage water heater with a storage water heater.
       5. This workpaper has savings values for many residential building types.

Documentation Requirements

* + - 1. The manufacturer’s name and equipment model number must be provided.
      2. If necessary, customer must provide proof of unit efficiency (e.g., manufacturer’s equipment specification sheet).

Terms and Conditions

* + - 1. Only storage water heaters as defined by the California Energy Commission qualify, and they must:
         1. Be used primarily for domestic hot water
         2. Have an input rating of less than 75,000 kBTU/hour.
         3. Never be used for process end-use.

| **Section** | **Value** |
| --- | --- |
| **Summary & Purpose** | High efficient storage water heaters are characterized by having superior insulating material and very effective heat transfer surfaces. These features reduce the water heaters envelope losses and the energy required to maintain the water at the desired set point temperature. In effect these reductions affect the work required by the water heater and provide an opportunity for energy savings.  Revision 2 is in response to CPUC Disposition on February 6, 2019 directing IOU/PAs to adopt the latest DEER 2019 water heating calculator energy impacts and READI v2.5.1 MeasureIDs and ImpactIDs associated with residential gas storage water heaters (rated under 75kBTU/h) for addressing the federal code change rating from EF to UEF. The costs were adopted from SCG’s WPSCGREWH180207A-Rev00. |
| **1.1 Measure & Baseline Data** | |  | | --- | | DEER Measure ID | | RG-WtrHt-SmlStrg-Gas-Ite75kBtuh-40G-HI-0p68UEF | | RG-WtrHt-SmlStrg-Gas-Ite75kBtuh-40G-MD-0p64UEF | | RG-WtrHt-SmlStrg-Gas-Ite75kBtuh-50G-HI-0p68UEF | | RG-WtrHt-SmlStrg-Gas-Ite75kBtuh-50G-MD-0p64UEF | |
| **1.2 Technical Description** |  |
| Measures | Energy savings for the measures included in this workpaper references READI v2.5.1 DEER MeaasureIDs and energy efficiency ImpactIDs with a start date of 1/1/2019.   |  |  |  |  | | --- | --- | --- | --- | | **Implementation ID.** | **Measure Description** | **DEER Measure ID** | **Delivery Type** | | 465943 | Natural Gas W/H 40 Gal UEF (0.64) | RG-WtrHt-SmlStrg-Gas-Ite75kBtuh-40G-MD-0p64UEF | PreRebDown/DnDeemed | | 465944 | Natural Gas W/H 40 Gal UEF (0.68) | RG-WtrHt-SmlStrg-Gas-Ite75kBtuh-40G-HI-0p68UEF | PreRebDown/DnDeemed | | 465945 | Natural Gas W/H 50 Gal UEF (0.64) | RG-WtrHt-SmlStrg-Gas-Ite75kBtuh-50G-MD-0p64UEF | PreRebDown/DnDeemed | | 465946 | Natural Gas W/H 50 Gal UEF (0.68) | RG-WtrHt-SmlStrg-Gas-Ite75kBtuh-50G-HI-0p68UEF | PreRebDown/DnDeemed | | 465947 | Natural Gas W/H 40 Gal UEF (0.64) | RG-WtrHt-SmlStrg-Gas-Ite75kBtuh-40G-MD-0p64UEF | PreRebUp/UpDeemed | | 465948 | Natural Gas W/H 40 Gal UEF (0.68) | RG-WtrHt-SmlStrg-Gas-Ite75kBtuh-40G-HI-0p68UEF | PreRebUp/UpDeemed | | 465949 | Natural Gas W/H 50 Gal UEF (0.64) | RG-WtrHt-SmlStrg-Gas-Ite75kBtuh-50G-MD-0p64UEF | PreRebUp/UpDeemed | | 465950 | Natural Gas W/H 50 Gal UEF (0.68) | RG-WtrHt-SmlStrg-Gas-Ite75kBtuh-50G-HI-0p68UEF | PreRebUp/UpDeemed | |
| Code for All Measures | Please reference WPSCGREWH180207A-Rev00Section 1.4.2 Codes and Standards Analysis |
| **1.3 Installation Type and Delivery Mechanisms** |  |
| Installation Type | Replace on burnout (ROB): 1/1/18 – 12/31/18  Normal Replacement (NR): 1/1/19 – no expiry yet |
| Delivery Mechanisms | * PreRebDown: 1/1/18 – 12/31/18 * DnDeemed: 1/1/19 – no expiry yet * PreRebUp: 1/1/18 – 12/31/18 * UpDeemed: 1/1/19 – no expiry yet |
| **1.4.1 DEER Data** |  |
| Net-to-Gross Ratio | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **NTGR ID** | **Description** | **Sector** | **BldgType** | **Measure Delivery** | **NTGR** | | Res-Default>2 | All other EEM with no evaluated NTGR; existing EEM with same delivery mechanism for more than 2 years | Res | Any | Any | 0.55 | |
| 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** | **EUL (Year)** | **RUL (Year)** | | WtrHt-Res-Gas | Residential Gas Water Heater | Res | SHW | 11 | 3.67 | |
| **Section 2. Calculation Methodology** |  |
| Energy Savings/Peak Demand Reduction – All Measures | Please reference WPSCGREWH180207A-Rev00 Section 2 Calculation Methodology |
| **Section 3. Load Shapes** | SDGE:DEER:Res:ClothesDishWasher  Annual |
| **Section 4. Costs** |  |
| **Section 4.1 Baseline and Measure Costs** |  |
| Base Cost | Please reference WPSCGREWH180207A-Rev00 Section 4.1 Base Case Cost for details on how baseline cost estimates were determined.  SDG&E adopts all cost and created SDG&E measure cost IDs for reporting purposes. SDG&E measure cost IDs are included in Ex-Ante tables submission. |
| Measure Cost | Please reference WPSCGREWH180207A-Rev00 Section 4.2 Measure Case Cost for details on how measure cost estimates were determined.  SDG&E adopts all cost and created SDG&E measure cost IDs for reporting purposes. SDG&E measure cost IDs are included in Ex-Ante tables submission. |
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