**Short Form Work Paper WPSDGEREWH0025**

**Revision 2**

**San Diego Gas & Electric**

**Energy Efficiency Engineering**

**Residential High Efficiency Instantaneous Water Heater**

**February 28, 2019**

**SDG&E – High Efficiency Instantaneous Water Heater**

**Introduction**

This short form workpaper documents the ex-ante load impact and cost-effectiveness values used for High Efficiency Instantaneous Water Heaters.

**Document Revision History**

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| --- | --- | --- | --- |
| **Rev** | **Date** | **Author** | **Summary of Changes** |
| 0 | 03/14/2018 | Keith Valenzuela/SDGE Contractor | - Adapted READI v.2.4.7 cost and energy impacts |
| 1 | 12/28/2018 | 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 WPSCGREWH120919A-Rev4  - Update also includes 2018 and 2019 Measure Application Types and Delivery Types.  Updated electric profile |
| 2 | 2/28/2019 | Eduardo Reynoso (SDG&E) | * Updated workpaper and ex-ante data base for adopting DEER gas instantaneous water heater MeasuresIDs, energy impacts and based on the latest 2019 DEER Water Heating calculator with 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”. |

**Measure Summary**

**Table 1: Measure Summary Table**

| **Section** | **Value** |
| --- | --- |
| **Summary & Purpose** | The short form workpaper documents the adoption of new residential gas instantaneous DEER water heater Measures IDs with a start date of 1/1/2019 that capture the EF to UEF conversion and based on the latest revision of the DEER 2019 Water Heating Calculator. The costs were adopted from SCG’s WPSCGREWH120919A-Rev4. |
| **1.1 Measure & Baseline Data** | |
| **1.2 Technical Description** | Please reference WPSCGREWH120919A-Rev4 Section 1.2 Technical Description |
| Measures | Energy Savings for the measures included in this workpaper references DEER Measure IDs and Impacts that will be used for 2019 with a start date of 1/1/2019.   |  |  |  |  | | --- | --- | --- | --- | | **Implementation ID.** | **Measure Description** | **DEER Measure ID** | **Delivery Type** | | 465969 | Small Tankless Water Heater, Tier 1 (UEF>=0.81), Low Draw | Inst\_UEF-Gas-175kBtuh-LW-0p81UEF | PreRebDown/DnDeemed | | 465970 | Small Tankless Water Heater, Tier 1 (UEF>=0.81), Medium Draw | Inst\_UEF-Gas-175kBtuh-MD-0p81UEF | PreRebDown/DnDeemed | | 465971 | Small Tankless Water Heater, Tier 1 (UEF>=0.81), High Draw | Inst\_UEF-Gas-175kBtuh-HI-0p81UEF | PreRebDown/DnDeemed | | 465972 | Small Tankless Water Heater, Tier 2 (UEF>=0.87), Low Draw | Inst\_UEF-Gas-175kBtuh-LW-0p87UEF | PreRebDown/DnDeemed | | 465973 | Small Tankless Water Heater, Tier 2 (UEF>=0.87), Medium Draw | Inst\_UEF-Gas-175kBtuh-MD-0p87UEF | PreRebDown/DnDeemed | | 465974 | Small Tankless Water Heater, Tier 2 (UEF>=0.87), High Draw | Inst\_UEF-Gas-175kBtuh-HI-0p87UEF | PreRebDown/DnDeemed | |
| Code for All Measures | Please reference WPSCGREWH120919A-Rev4 Section 1.4.2 Codes and Standards Analysis |
| Requirements | Eligibility Requirements   * Test methods for measuring water heater efficiencies are referenced in the California Titles 20 and 24 standards1,2. * Meet minimum qualifying uniform energy factor (UEF) for small or medium (<200 MBtu/hr) tankless water heaters replacing storage water heaters:   + 0.81 UEF for Tier 1 (non-condensing)   + 0.87 UEF for Tier 2 (condensing) * Meet minimum emission requirements per air district. * Tier 2 hot water heaters are condensing and often require flue modifications to handle the condensate.   Implementation Requirements   * The rebate applies to one natural gas tankless water heater replacing one natural gas storage water heater on burnout or to new installations in existing buildings. * This measure is applicable only to single family and multifamily residential domestic (or “service”) hot water applications with a water heater in (single family only), or attached to, each dwelling unit or in adjacent units (multifamily only). Table 4 - displays approved sectors and subsectors. * This measure is limited to single family residences with a water heater and multifamily residences with a water heater in each dwelling unit or with a water heater serving adjacent unit. * This measure applies to replacing a storage water heater with a tankless water heater. * This Workpaper does not cover water heaters or hot water boilers used for commercial domestic hot water, space conditioning, industrial (process) end-use, pool, or spa applications.   Documentation Requirements   * The manufacturer’s name and equipment model number must be provided. * If necessary, customer must provide proof of unit efficiency (e.g., manufacturer’s equipment specification sheet).   Terms & Conditions   * Only tankless water heaters as defined by the California Energy Commission qualify. They must:   + Be used primarily for domestic hot water   + Be installed at the point of use   + Provide hot water only when there is a hot water draw from the end use   + Not be connected to an external storage tank.   + Have an input rating of at least 4,000 Btu per hour per gallon of stored water.   + Never be used to supply hot water to a circulation loop |
| **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 |
| **1.4.1 DEER Data** | |
| Net-to-Gross Ratio | Res-Default>2 |
| Effective and Remaining Useful Life |  |
| GSIA | Screen Clipping |
| **Section 2. Calculation Methodology** | |
| Energy Savings/Peak Demand Reduction – All Measures | All energy efficiency savings impacts are being adopted from READI v2.5.1 tool for DEER 2019 MeasureIDs associated for residential tankless water heaters (rated under 175kBTUh) that were developed from the latest version of the DEER 2019 Water Heating Calculator. |
| **Section 3. Load Shapes** | |
| Load Shape | SDGE:DEER:Res:ClothesDishWasher  Annual |
| **Section 4. Cost** | |
| **Section 4.1 Base and Measure Costs** | |
| Base Cost | Please reference WPSCGREWH120919A-Rev4 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 WPSCGREWH120919A-Rev4 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. |