Short Form Work Paper WPSDGENRHC0025

**Revision 0**

**San Diego Gas & Electric**

**Energy Efficiency Engineering**

**Unitary Air-Cooled Commercial Air Conditioners and Heat Pumps 65kBtuh and Over**

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# SDG&E Unitary Air-Cooled Commercial Air Conditioners and Heat Pumps 65kBtuh and Over

## Introduction

This short form workpaper documents the Ex-ante adoption of DEER /READI Measures IDs and Cost IDs. All electric and gas savings impacts as well as cost (measure and standard) are herein adopted from the latest DEER/READI update. These measures apply to unitary air-cooled air conditioners and heat pumps that are 65kBtuh and over.

## Document Revision History

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| --- | --- | --- | --- |
| Revision # | MM/DD/YY | Author/Affiliation | Summary of Changes |
| 0 | 1/02/2018 | Eduardo Reynoso  and Josh Williams/ SDGE | 1. Adoption of short form workpaper for Unitary -Air Cooled AC and HP 65kBtuh and Over 2. Merged Ex-ante database to account for June 2017 DEER HVAC updates per CPUC Resolution E4867. 3. Updated legacy Implementations based on source description of DEER June 2017 Update. Refer to “Summary & Purpose” section on page 4. 4. Created new Implementations based on new DEER Measure Description for “NE-HVAC-airAC-SpltPkg-65to134kBtuh”. New SDG&E Implementations are provided per “Measure & Baseline Data” section on page 5 below. 5. Retired legacy implementations based on DEER Measures expiry associated with air cooled AC units from 65kBtuh to 109 kBtuh, and 109 kBtuh to 134 kBtuh. Retired SDG&E Implementations are identified in the Summary & Purpose section on page 3 below. 6. Retired legacy implementations based on prior DEER Measure ID expiry dates as referenced herein on page 7. 7. Removed all Unitary Air-Cooled Heat Pump DEER 2014 Measures ID and SDG&E Implementation given that DEER 2017 did not updated these measures. 8. Updated Ex-ante database with effective start dates of 1/1/2017 and 7/1/2017 to align with portfolio cycle. |
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## Measure Summary

Table : Measure Summary Table

| **Section** | **Value** |
| --- | --- |
| **Summary & Purpose** | This short form workpaper documents the 2017 Ex-ante adoption and merging of DEER HVAC Measures associated with Unitary Air-Cooled Air Conditioners and Heat Pumps for 65kBtuh and over. SDG&E only change to Ex-ante data is the effective start date of new DEER Measures that took effect 7/1/2017 versus 1/1/2017. New Ex-ante implementation will have an effective start date of 1/1/2017 to bridge the gap in time between expired DEER measures (12/31/2016) and new DEER measures (7/1/2017) .  SDG&E Unitary Air Conditioning Legacy Implementations to be retired by 12/31/2017.   |  |  |  |  | | --- | --- | --- | --- | | Measure Codes | Measure Characteristic | | | | SDG&E | Expired DEER Measure ID | Delivery Type | Status | | 463659 / 463723 | NE-HVAC-airAC-SpltPkg-65to109kBtuh-11p5eer-wPreEcono | PreRebUp /  PreRebDown | Retired | | 463660 and 463781 /  463724 | NE-HVAC-airAC-SpltPkg-65to109kBtuh-12p0eer-wPreEcono | PreRebUp / PreRebDown | Retired | | 463661 / 463725 | NE-HVAC-airAC-SpltPkg-65to109kBtuh-13p0eer | PreRebUp / PreRebDown | Retired | | 463662 / 463726 | NE-HVAC-airAC-SpltPkg-65to109kBtuh-13p0eer-wPreEcono | PreRebUp / PreRebDown | Retired | |
| **Summary & Purpose (continued)** | SDG&E Unitary Air Conditioning Legacy Implementations submitted for DEER Updates   |  |  |  |  | | --- | --- | --- | --- | | Legacy Measure Codes | Measure Characteristic | | | | SDGE | DEER Measure ID | Delivery Type | Version-Source | | 463653 /  463717 | NE-HVAC-airAC-SpltPkg-135to239kBtuh-12p5eer | PreRebUp and PreRebDown | DEER2017-D17 v2 | | 463654 / 463718 | NE-HVAC-airAC-SpltPkg-240to759kBtuh-10p8eer | PreRebUp and PreRebDown | DEER2017-D17 v2 | | 463655 / 463719 | NE-HVAC-airAC-SpltPkg-240to759kBtuh-11p5eer | PreRebUp and PreRebDown | DEER2017-D17 v2 | | 463656 / 463720 | NE-HVAC-airAC-SpltPkg-240to759kBtuh-11p5eer | PreRebUp and PreRebDown | DEER2017-D17 v2 | | 463657 / 463721 | NE-HVAC-airAC-SpltPkg-240to759kBtuh-12p5eer | PreRebUp and PreRebDown | DEER2017-D17 v2 | | 463658 /  463722 | NE-HVAC-airAC-SpltPkg-240to759kBtuh-12p5eer | PreRebUp and PreRebDown | DEER2017-D17 v2 | | 463331 | NE-HVAC-airAC-SpltPkg-gte760kBtuh-10p2eer | PreRebDown | DEER2017-D17 v2 | | Note: Unitary Air-Cooled Heat Pumps were not affected by the HVAC June 2017 DEER update. Given that no DEER changes/updates were made they are still effected by the 2016 CA Building Code T20/24 equipment requirements code updated per Section 1.2 so the DEER Code/ Standard assumptions are no longer valid which nullify the DEER Measures energy impacts.  The Following Implementations for Unitary Packaged Heat Pump (>=65kBtuh) do not comply with 2016 CA Building Equipment Requirement code.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | 463329 | 463330 | 463684 | 463685 | 463686 | 463687 | 463688 | | 463749 | 463750 | 463751 | 463752 | 463753 | 463754 | 463782 | | 416232 | 416233 | 416235 | 416236 | 416237 | 416238 | 416239 | | 416240 | 416241 | 416242 | 416243 | 416244 | 416245 |  | | | | | |
| **1.1 Measure & Baseline Data** | New DEER Measures IDs and Cost IDs are being adopted from DEER official database based on June 2017 DEER updated source description with implementation start date of 1/1/2017.   |  |  |  |  | | --- | --- | --- | --- | | New Measure Code | Measure Characteristic | | | | SDGE | New DEER Measure Description | New DEER Measure ID | Delivery type | | 464032 / 464048 | EER-rated packaged Air Conditioner, Size Range: 65 - 134 kBTU/h, EER = 12, min IEER = 13.5 EIR = 0.247 Fan W/CFM = 0.4, two-speed fan, with Econo | NE-HVAC-airAC-SpltPkg-65to134kBtuh-12p0eer-wPreEcono | ReRebUp /  ReRebDown | | 464033 / 464049 | EER-rated packaged Air Conditioner, Size Range: 65 - 134 kBTU/h, EER = 12.5, min IEER = 14, EIR = 0.236 Fan W/CFM = 0.4, two-speed fan, with Econo | NE-HVAC-airAC-SpltPkg-65to134kBtuh-12p5eer-wPreEcono | ReRebUp /  ReRebDown | | 464034 / 464050 | EER-rated packaged Air Conditioner, Size Range: 65 - 134 kBTU/h, EER = 13, min IEER = 15, EIR = 0.226 Fan W/CFM = 0.4, two-speed fan, with Econo | NE-HVAC-airAC-SpltPkg-65to134kBtuh-13p0eer-wPreEcono | ReRebUp /  ReRebDown | | 464051 /  464052 | EER-rated packaged Air Conditioner, Size Range: 65 - 134 kBTU/h, EER = 11.5, min IEER = 13, EIR = 0.26, Fan W/CFM = 0.4, two-speed fan, with Econo | NE-HVAC-airAC-SpltPkg-65to134kBtuh-11p5eer-wPreEcono | ReRebUp /  ReRebDown | | Note: Legacy Implementations for DEER Measure Characteristics are provided in Ex-Ante Implementation tables. Given that the June 2017 DEER updated did not include new Measures IDs, then no new air-cooled heat pump implementations have been created. | | | | |
| **1.2 Technical Description** | As stated per DEER Measure HVAC systems for Unitary Air-Cooled Air Conditions and Heat Pumps for 65kBtuh and Over. |
| Code for All Measures | As cited per DEER HVAC Updated for June 2017 for Unitary Air-Cooled Air Conditioners and Heat Pumps 65kBtuh and Over.  2016 California Title 20/24 Building and Appliance Efficiency Regulations Section 4.2 Equipment Requirements Table 4-1 and Table 4-2. |
| **1.3 Installation Type and Delivery Mechanisms** |  |
| Installation Type | * ROB/NR – Replace On Burnout or Normal Replacement |
| Delivery Mechanisms | * PreRebDown - Downstream Prescriptive Rebate * PreRebUp – Upstream Prescriptive Rebate |
| **1.4.1 DEER Data** |  |
| Net-to-Gross Ratio | |  |  |  |  | | --- | --- | --- | --- | | Measure code | Sector | NTG ID | NTG Value | | Refer to Ex-Ante database | Com/ Non-Res | NonRes-sAll-mHVAC-DX-up | 0.75 | | Refer to Ex-Ante database | Com/ Non-Res | Com-Default>2yrs | 0.60 | | Refer to Ex-Ante database | Com/ Non-Res | NonRes-sAll-mHVAC-Pkg | 0.75 | |
| GSIA | |  |  |  |  | | --- | --- | --- | --- | | Measure code | GSIA ID | Description | GSIA Value | | Refer to Ex-Ante database | Com-AC-SDG | Non-Res AC Replacement; Annual Installation Rate | 1 | | Refer to Ex-Ante database | Def-GSIA | Default GSIA values | 1 | |
| Effective and Remaining Useful Life | EUL ID : HVAC-airAC = 15 years |
| **Section 2. Calculation Methodology** | All energy savings impacts are based on DEER Measure IDs June 2017 HVAC updates as referenced in the SDG&E Ex-anted database Implementation tables. |
| **Section 3. Load Shapes** | ElecImpProfile = DEER:HVAC\_Split-Package\_AC  GasImpProfile = Annual |
| **Section 4. Costs** | All cost adopted and cited from DEER Measure IDs, please refer to SDG&E Ex-ante database Implementations table. |
| **Section 4.1 Modeled Costs** | Adopting DEER/READI Technology cost as provided by June 2017 DEER HVAC update per CPUC Resolution E4867.  The following are new SDG&E Implementations based on new DEER Measure IDs for June 2017.   |  |  |  |  | | --- | --- | --- | --- | | DEER Msr IDs | New Measure Code | DEER /READI Cost Characteristics | | | SDGE | Measure Cost ID | Standard Cost ID | | NE-HVAC-airAC-SpltPkg-65to134kBtuh-12p0eer-wPreEcono | 464032 / 464048 | dxAC-Com-Pkg-65to134kBtuh-EER12.0-2Spd | dxAC-Com-Pkg-65to134kBtuh-EER11.0-2Spd | | NE-HVAC-airAC-SpltPkg-65to134kBtuh-12p5eer-wPreEcono | 464033 / 464049 | dxAC-Com-Pkg-65to134kBtuh-EER12.5-2Spd | dxAC-Com-Pkg-65to134kBtuh-EER11.0-2Spd | | NE-HVAC-airAC-SpltPkg-65to134kBtuh-13p0eer-wPreEcono | 464034 / 464050 | dxAC-Com-Pkg-65to134kBtuh-EER13.0-2Spd | dxAC-Com-Pkg-65to134kBtuh-EER11.0-2Spd | | NE-HVAC-airAC-SpltPkg-65to134kBtuh-11p5eer-wPreEcono | 464051 /  464052 | dxAC-Com-Pkg-65to134kBtuh-EER11.5-2Spd | dxAC-Com-Pkg-65to134kBtuh-EER11.0-2Spd |   All legacy SDG&E Implementation ID and cost ID have been provided in the Ex-ante database submittal. The cost associated with the DEER Measures IDs were not affected by the recent DEER June 2017 update. |

Legacy Implementations to be retired based on previous DEER updates

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| --- | --- | --- |
| Technology Type | Effective Retired date | Legacy Implementation ID |
| Pkg AC (EER) | 12/31/2017 | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | 416200 | 416201 | 416202 | 416203 | 416204 | 416205 | 416206 | | 416207 | 416208 | 416209 | 416210 | 416211 | 416212 | 416213 | | 416214 | 416215 | 416216 | 416217 | 416218 | 416219 | 416220 | | 416221 | 416222 | 416224 | 416225 | 416228 | 416229 | 463314 | |
| Pkg HP (EER) | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | 416230 | 416231 | 416246 | 416247 | 416248 | 416249 | 416250 | | 416309 | 416310 | 416311 | 416312 | 416313 | 416314 | 416315 | | 416316 | 416317 | 416318 | 416319 |  |  |  | |