PUBLIC UTILITIES COMMISSION

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Savings Adjustment Statement

On 2019 Expected Energy Efficiency Savings for the 2020
Efficiency Savings and Performance Incentive

October 15, 2020

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1. Introduction

Through its Efficiency Savings and Performance Incentive (ESPI) mechanism, the California Public Utilities Commission (CPUC) provides annual monetary awards to California's four major investor-owned utilities (IOU) in reward for achievement in four energy efficiency-related categories.[1] The IOUs are Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), San Diego Gas & Electric Company (SDG&E), and Southern California Gas Company (SoCalGas). This Savings Adjustment Statement provides information for the "energy efficiency resource savings" ESPI category, which rewards resource program[2] net lifecycle energy savings.

Energy efficiency resource savings are calculated in two ways, depending on resource program and energy efficiency measure type. Expected (aka ex ante) savings based on pre-installation estimates and well-known measure savings parameters are used for "not-uncertain"[3] deemed[4] energy efficiency measures. Evaluated (aka ex post) savings are used for "uncertain" deemed measures and custom energy efficiency projects.

This statement describes the review of the IOUs' program year (PY) 2019 expected savings claims for not-uncertain deemed measures and provides CPUC Staff's proposed ESPI

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[1] D.13-09-023, *http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M076/K775/76775903.PDF*

[2] A resource program is an energy efficiency program intended to achieve quantified energy savings.

[3] "Uncertain" measures are those included on the *Final 2019 Efficiency Savings and Performance Incentive (ESPI) Uncertain Measures List*, and "not-uncertain" measures are those excluded from the list, found at *https://pda.energydataweb.com/api/view/2100/2019UncertainMeasuresListMemo_2018-10-31c.pdf.* See D.13-09-023 at 42 and 50.

[4] "Deemed" energy efficiency measures are those with predetermined, or "deemed," savings estimates. They represent all portfolio savings from programs other than custom projects or codes & standards advocacy programs.

award amounts for those savings. Not-uncertain deemed measures caused 2.1% and 13.8% of the net lifecycle electric and gas savings, respectively, in the PY2019 energy efficiency portfolio. This is 6.5% and 46.2% of the net lifecycle electric and gas savings, respectively, in the PY2019 energy efficiency resource savings ESPI category (i.e., savings from deemed and custom measures, but not codes and standards programs[5]).

While not-uncertain deemed measures are typically not subject to evaluation, monitoring, and verification (EM&V), the claims are reviewed to ensure the expected savings are based on approved workpaper methods and values. This is in accordance with D.13-09-023, which says to verify that there are no "errors in the ex ante parameter values and calculations."[6] Some of these parameters are effective useful lives (EUL), remaining useful lives (RUL), net-to-gross ratios (NTGR), and unit energy savings (UES). A combination of EUL and RUL, depending on the measure application type, is used with a measure's first year savings to calculate its gross lifecycle savings. The gross lifecycle savings and NTGR are used to calculate net lifecycle savings.[7] There was no need to verify savings calculations as the California Energy Data and Reporting System (CEDARS) does not allow the upload of records with calculation errors.

The previous reviews of not-uncertain deemed measure claims discovered discrepancies including projects claimed in the wrong PY; incorrect EULs, RULs, and NTGRs; and incorrect UES values resulting from incorrect load factors, daily load shapes, etc.[8] This year, Staff reviewed and adjusted any incorrect PYs, EULs, RULs, and NTGRs of high-savings measure groups accounting for both gas and/or electric savings.

The data for this review were derived from these sources:

- California Energy Data and Reporting System (CEDARS): A database containing annual reported claims, which include IOU inputs of measure installation rates and costs, and IOU selections of CPUC-approved EUL, RUL, NTGR, and UES values.[9]
- Workpaper and Disposition Archive: A database containing the CPUC-approved EUL, RUL, NTGR, and UES values for individual workpapers in effect in 2019.[10]
- Database for Energy Efficiency Resources (DEER): A database containing CPUC-approved EUL, RUL, NTGR, and UES values.[11]

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[5] See the ESPI web page, *https://www.cpuc.ca.gov/General.aspx?id=4137*, *2019 Ex-Ante Savings Adjustment Statement and workbooks*.
[6] See D.13-09-023 at 51 and 91:
http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M076/K775/76775903.PDF
[7] Calculation methods are specified in the CPUC's "Energy Efficiency Policy Manual," available at *https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/EEPolicyManualV5forPDF.pdf*.
[8] See the ESPI web page, *https://www.cpuc.ca.gov/General.aspx?id=4137*, *2018 Ex-Ante Savings Adjustment Statement*.
[9] *https://cedars.sound-data.com*
[10] *http://deeresources.net/workpapers*, filtering for Ex Ante Database Tables by workpaper ID
[11] See the DEER using the Remote Ex-Ante Database Interface: *http://deeresources.com/index.php/ex-ante-database/accessing-the-ex-ante-data*

The following sections of this statement describe the process of organizing and checking the not-uncertain deemed claims data. The verified savings and corresponding ESPI earnings can be found in the *2019 Expected Savings Workbooks* on the ESPI web page.[12]

2. Assignment of energy savings claims from CEDARS into ESPI groups

CPUC Staff used the final 2019 annual claims from CEDARS as the basis for calculating the expected savings incentive. The savings values reflect a 5% of gross lifecycle savings addition for market effects that was made in CEDARS to the reported savings values.[13] Staff assigned each IOU claim into one of four ESPI groups: custom, uncertain deemed, not-uncertain deemed, and codes and standards. Only claims assigned to the first three groups are eligible for the ESPI energy efficiency resource savings award. Only the not-uncertain deemed claims are eligible for the expected savings awards detailed in this statement. Table 1 shows the percentages of IOUs' net lifecycle energy efficiency resource savings that result from not-uncertain deemed claims.

Table 1 – Percentage of ESPI Savings in the Not-Uncertain Deemed ESPI Category

IOU	Percentage of ESPI Savings from Not-Uncertain Deemed Claims		
	Net Lifecycle kW	Net Lifecycle kWh	Net Lifecycle Therm*
PG&E	8.4%	6.2%	41.5%
SCE	7.2%	6.3%	N/A
SoCalGas	N/A	N/A	53.5%
SDG&E	4.4%	2.6%	12.9%
Total Statewide	7.7%	6.5%	46.2%

*Only positive therm savings are included in this metric.

3. Removal of projects claimed in the wrong program year

Energy savings from not-uncertain deemed measures only receive incentives if the measures were installed in the program year under consideration.[14] Table 2 shows the total net lifecycle savings by IOU following the removal of claims installed prior to 2019.

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[12] See the ESPI web page, https://www.cpuc.ca.gov/General.aspx?id=4137, *2019 Expected Savings Workbooks*

[13] See D.13-09-023 at 27 and 36.

[14] The installation date-based claims rule was introduced in D.04-09-060 (at 33 and Findings of Facts 14), clarified and reiterated in D.05-04-051 (at 55, Findings of Fact 36-42, Conclusion of Law 3, Ordering Paragraph 17), D.05-09-043 (at 84) and again in Resolution G-3510 (at 13) and Resolution 4807 (OP 10).

Table 2 – Total Net Lifecycle Savings, Adjustment for Incorrect Installation Year

IOU	Savings Type	Net Lifecycle kW	Net Lifecycle kWh	Net Lifecycle Therm*
PG&E	Reported	69,805	313,324,293	50,597,253
	Adjusted	61,528	284,924,606	49,952,453
SCE	Reported	42,546	247,090,926	3,108,909
	Adjusted	42,203	230,999,519	3,074,011
SoCalGas	Reported	3,961	70,655,631	58,248,953
	Adjusted	3,603	60,120,577	49,203,739
SDG&E	Reported	8,060	30,914,298	857,991
	Adjusted	7,996	30,773,885	862,808

*Only positive therm savings are included in this metric.

4. Verification of EUL, RUL, and NTGR parameters

Staff targeted electric and gas not-uncertain deemed measure groups with the largest impact that were not studied as part of an impact evaluation for verification[15]. The top electric and top gas savings measures were selected as these measures contributed over 70% of both electric and gas not-uncertain deemed measure savings excluded from impact evaluations.

Each claim includes EUL, RUL, and NTGR identification codes along with the numeric values of these parameters. Staff checked whether the identification codes and numeric values agreed with those approved in the measures' workpapers. Staff also verified that the workpaper numeric values were updated with the DEER values approved for the claims' installation periods.

5. Proposed ESPI award amounts for PY2019 expected energy savings

D.13-09-023 established earnings coefficients to be applied to each unit of savings achieved, and these were updated to the following in a 2020 joint advice letter.[16]

Electricity ($/GWh)	$2,122
Peak Demand ($/MW – Yr)	$5,296
Natural Gas ($/MM Therm)	$17,657

Staff applied these coefficients to the adjusted net lifecycle expected savings values to calculate the proposed expected savings earnings amounts which will be provided in the resolution.

Appendix A: Detailed Description of Parameter Updates

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[15] See Section 1.2 Selected Measure Groups in the attachment in Appendix A.
[16] See the ESPI web page, https://www.cpuc.ca.gov/General.aspx?id=4137, *2019 ESPI Earning Coefficients and Caps.*

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Copy:	Peter Lai CPUC	**Date:**	September 21, 2020

ESPI-2019 tracking data review and update of Deemed Not-Uncertain Measures (DNUM)

The objective of this targeted and time-limited review is to ensure that the IOU claims for deemed not-uncertain measures have appropriate Net-to-Gross-Ratio (NTGR), Effective Useful Life (EUL), Gross Savings Installation Adjustment (GSIA) factors and spot-checking of UES values. In addition to the normal checks that are part of this validation effort, PY2019 was also a significant transition year for deemed savings system changes. It is the first year that many of the structural data changes required by DEER Resolution E-4952 were implemented such as new Measure Application Types (MATs), resetting of EULs for behavioral, retrocommissioning and operational (BRO) measures, and a new and overhauled NTG table (NTG 2020). There was also as non-routine, mid-year workpaper update for smart thermostat measures which required a closer look at installation dates versus workpaper effective dates. As with previous cycles, the deemed ex ante team (DNV GL supported by ERS) compared parameters in the ATR (All Things Reported) database versus the workpapers and DEER parameters.

On a final note for next year's review: PY2019 will be the last program year for PA-specific workpapers. For PY2020 only statewide workpapers will be the used by all PAs which should make this process easier. The generation of these workpapers is facilitated by the California Technical Forum (Cal TF) and their electronic Technical Reference Manual (eTRM).

1 APPROACH

DNV GL with ERS support conducted a targeted review for a total of five electric and five gas Measure Groups.We focused on those Measure Groups that had tthat the most lifecycle gross savings within DNUM measures and confirmed the correct net-to-gross factor and measure life was used in the calculation for each claim. The DNUM dataset was defined by applying appropriate filters as described in Section 1.1. The claims were grouped by the 'Measure Group' and ranked from highest to lowest savings. A final dataset was created that included the measure groups with the largest percentage of DNUM group savings.

Verification of measure group claims consisted of cross-checking each claim against the DEER or workpaper specified measure life and net-to-gross ration (NTGR) factor. Each claim record included a NTG_ID EUL_ID, or RUL_ID that could be matched to values in DEER tables allowing a confirmation of whether the claim used the correct value. We also comfirmed that the IDs references in the claims were the correct IDs as specified in the approved workpaper for that measure.

1.1 Defining the DNUM Dataset

DNV GL started with the full claim tracking data set and filtered as show as summarize below:

1) Start with the full PY2019 claims data set
2) Filter on ESPI_GROUP = " PrelimExAnteDeemed"
    a. UncertainMeasure = Null also indicates a <u>not</u> uncertain measure.
3) Identify the Measure Groups with the largest percent of savings then add in the workpaper information to identify the measures with the most savings with each group
    a. NOTE: The final list of measures is not final until EM&V effort is over.
    b. For PY2019 the final Measure Group and EM&V classification were completed after this work started, but updates did not impact our list.
    c. The final condensed Measure Group and EM&V assignments workbook was issued 7/22/2020: *TRK_PY2019_RoadMapSummary_20200722.xlsx*
4) Within a Measure Group, focus on the workpapers with the highest impact on the Measure Group lifecycle savings
5) Take a close look at residential smart thermostats where a non-routine mid-year workpaper change occurred due to significant issues with the previous workpapers.
6) For perspective: Examine total DNUM measure gas and electric savings versus the total deemed measure portfolio, see calculations below:
    a. DNUM = ESPI_Group = PrelimExAnteDeemed = 118,018,789
    b. Deemed portfolio = ESPI_Deemed+PrelimExAnteDeemed
        i. First Year kWh Total = Sum: 551,103,146
        ii. First Year kWh DNUM = 118,018,789 (DNUM about 21% of all deemed savings so not insignifcant)

1.2 Selected Measure Groups

We focused our effort on the five electric and five gas Measure Groups that had the largest impact on DNUM group measure lifecycle gross savings shown in Table 1 and Table 2. These Measure Groups encompass a total of 83 individual workpapers and 73% of electricty savings and 79% of gas savings. These tables also show the overlap between electric and gas Measure Groups where Review Priority starts with a G or E (indicates the Review Priority in the other fuel type).

Table 1 2019 High-Impact Electric Savings Measure Groups

Measure Group	First Year Gross kWh	Lifecycle Gross kWh	Percent of Total DNUM	Cumulative Percent	Review Priority
HVAC CONTROLS THERMOSTAT	27,874,030	288,186,569	29%	29%	1
HVAC ROOFTOP OR SPLIT SYSTEM	10,209,458	153,141,874	16%	45%	2
REFRIGERATION EVAPORATOR EC MOTORS	7,202,294	108,034,412	11%	56%	3
LIGHTING OUTDOOR LED STREETLIGHT	20,047,675	81,491,806	8%	64%	4
HVAC CONTROLS FAN	14,428,949	60,270,109	6%	70%	5

	First Year Gross Therms	Lifecycle Gross Therms			
FOOD SERVICE	2,730,521	32,727,469	3%	73%	G2
WATER HEATING SHOWERHEAD	466,119	4,008,268	0%	73%	G5

Table 2 2019 High-Impact Gas Savings Measure Groups

Measure Group	First Year Gross Therms	Lifecycle Gross Therms	Percent of Total DNUM	Cumulative Percent	Review Priority
PIPE INSULATION HOT APPLICATION	7,357,924	53,037,694	34%	34%	1
FOOD SERVICE	2,674,250	32,100,287	21%	55%	2
HVAC CONTROLS THERMOSTAT	1,977,750	19,849,173	13%	67%	3
PROCESS OTHER	989,103	9,883,330	6%	74%	4
WATER HEATING SHOWERHEAD	1,048,264	6,818,025	4%	78%	5
HVAC CONTROLS FAN	285,954	862,925	1%	79%	E5
REFRIGERATION EVAPORATOR EC MOTORS	-12,384	-185,765	0%	--	E3
HVAC ROOFTOP OR SPLIT SYSTEM	-55,581	-833,717	-1%	--	E2

2   REVIEW OF HIGH-IMPACT SAVINGS MEASURE GROUPS

The sections below summarize our review of the high-impact Measure Groups. This was targeted and time-limited review is to ensure that the IOU claims for deemed not-uncertain measures have appropriate NTG, EUL, GSIA values with spot checks of UES values whenever possible. Only several corrections and updates were needed as documented in the *DNUM Claimed Savings Update.xlsx* workbook. The majority of records we checked were using the correct values.

2.1.1 HVAC CONTROLS THERMOSTAT

This Measure Group accounts for the largest fraction of electric DNUM lifecycle gross savings (29%) and third largest fraction of gas DNUM lifecycle gross savings (13%). The claims are covered by eleven workpapers, some of them exclusively gas savings. All of the workpapers will be replaced by a single statewide workpaper for PY2020, so UES values were not reviewed. This Measure Group is the one most significantly impacted up updates due to a non-routine, mid-year update to the residential smart thermostat workpaper that changed the EUL from 11 to 9.1 years. The workpaper effective date 7/6/2019. Unfortunately, the claims data contains a number of dates. However, the claims that used the correct 9.1 EUL seemed to show a value of 7/5/2019 in the *ProjectCompletionDate* field, so that is the field we used as the indicator for where an EUL update is needed.

In addition, PY2019 claims included two workpapers (PGE3PHVC153-4 and SCE17HC054.0) for a commercial smart thermostat application, but we did not review this measure as savings were a small percentage of the Measure Group and the workpaper was retired at the end of 2019.

2.1.2 HVAC ROOFTOP OR SPLIT SYSTEM

All of the claims in this measure group were covered by nine workpapers, including PGECOHVC128-9, PGECOHVC126-7, PGECOHVC172-1, PGECOHVC172-0, SCE17HC012.1, SCE17HC035.1, SCE17HC068.0, WPSDGENRHC0025-0, and WPSDGENRHC0023-2. The claimed NTG, EUL, and GSIA

values were compared to DEER Support Table and workpaper values. No inconsistencies were found between the claim and workpaper values but these are DEER savings measures so very prescriptive in nature. This Measure Group also accounts for the largest percent of negative savings (increased gas energy use) so we targeted those for review too and they are derived from DEER building simulations so no additional verification was needed.

2.1.3 REFFRIGERATION EVAPORATOR EC MOTORS

The claimed NTG, EUL, and GSIA values were compared to DEER Support Table and workpaper values and no discrepancies were found.

2.1.4 LIGHTING OUTDOOR LED STREETLIGHT

This Measure Group accounts for about 8% of the DNUM lifecycle kWh savings. All of the claims are covered by two PA-specific workpapers: SCE17LG097.2 for SCE at 97% of lifecycle gross savings and the remaining 3% for PGECOLTG151-8 for PG&E. SCE's measures use an AR MAT while PG&E uses an NR MAT. No changes were made to claims for either of these measures though. Although almost all outdoor LED lighting measures were supposed to be discontinued at the end of 2018 to reflect a 100% LED baseline, it appears there may are workpaper extensions or exceptions for both PG&E and SCE:

- From deeresources.net, "Commercial Lighting workpaper Memo_12162018.pdf" a summary of the disposition describes this as" Disposition Extending Eligibility of Pacific Gas and Electric's (PG&E) Commercial Lighting workpapers: PGECOLTG151, PGECOLTG179, PGECOLTG178 through March 31, 2019" Consulation with the workpaper review team (ERS) confirmed that one of the measures covered by this workpaper did receive an extension.
- SCE also appears to have received an special extension too. SCE has a grandfathered streetlight program and it was recently extended even further through December 31, 2022.[1]

In addition, PG&E used a NTG value of 0.91 for a NTG_ID=Com-Out-Ltg-LEDFixt which is a correct and valid value from the DEER Support Tables. This NTG value is reserved for 100% LED baselines but ERS confirmed that the value was being used correctly and we confirmed the value is in the workpaper.

2.1.5 HVAC CONTROLS FAN

All of the claims in this measure group were covered by six workpapers, including PGE3PHVC150-4, PGE3PHVC157-3, PGE3PHVC157-4, SCE17HHC052.0, WPSCGREHC161128A-1, and WPSDGEREHC0024-3. The claimed NTG, EUL, and GSIA values were compared to workpaper values as part of the review for this measure group. No inconsistencies were found between the claim and workpaper values. It is worth noting that claims including hard-to-reach (HTR) groups use a NTG value of 0.85 which is presumed to be correct. However, this value and discussion surrounding NTG for HTR groups is not documented in any of the above workpapers. Additionally, review of workpaper PGE3PHVC157-3

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[1] Resolution E-5096 sent to Proceeding list 7/23/2020, CPUC document #344070862 Request by SCE for a time extension to claim savings for the Los Angeles County Streetlight Project. Original deadline extended from 12/31/2020 to 12/31/2022 and claims will continue to be excluded from SCE's EE portfolio cost-effectiveness calculations.

confirmed that the claim data uses the incorrect EUL_ID HVAC-RedcOverVent instead of NonRes-RCx-Operational.

2.1.6 PIPE INSULATION HOT APPLICATION

This Measure Group accounts for the largest fraction (about 34%) of the DNUM gas savings. All of the claims are covered by two PA-specific workpapers: PGECOPRO108-1 for PG&E at 82% of lifecycle gross savings and WPSCGWP110812A-5 for SCG accounting for the remainder (18%). Both use a Measure Application Type (MAT) of add-on equipment (AOE) which has somewhat complicated rules for selecting the correct EUL[2]. They are both commercial sector measures. One issue requiring an update was found for each workpaper:

- PGECOPRO108-1 (PG&E) appears to have used an expired NTG value (12/31/2018) for the NTG_ID (NonRes-sAll-mPipeIns-deemed) and as such the NTG value needs to be updated from 0.6 to 0.45.
- WPSCGWP110812A-5 (SCG) incorrectly used the EUL_ID and corresponding EUL values for the pipe insulation instead of the EUL of the heating source. Using an EUL_ID=WtrHt-Instant-Com which was used for the PG&E workpaper reduces the EUL value from 11 years to 6.7 years.

2.1.7 FOOD SERVICE

The claimed NTG, EUL, and GSIA values were compared to DEER Support Table and workpaper values and no discrepancies were found.

2.1.8 PROCESS OTHER

All of the claims in this measure group were covered by two workpapers, including PGECOAPP130-0 and WPSCGNRAP170103-0. The claim NTG, EUL, and GSIA values were compared to workpaper values as part of the review for this Measure Group. The only inconsistency found was the EUL listed in the claim data and the workpaper. The claim data lists a 10 year EUL however this needs to be updated to one-third of that value since the MAT is add-on equipment (AOE). Furthermore, the wrong EUL_ID was used. The measure is a gas dryer modulating valve but an EUL_ID for a HPWH was used (WtrHt-HtPmp). The EUL_ID specified in the workpaper was Com-GasDryer with an EUL=14 years but it is not in the DEER EUL Support Table. It is likely that a request for the new EUL was either never requested by the PA or could have been rejected by the DEER team, so the heat pump water heater may have been chosen just to get the measure through CEDARS. However, the current statewide version of this workpaper uses an EUL_ID=Appl-EffCD with EUL=12 and RUL=4, so this is what we will apply for the update.

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[2] The EUL for an AOE measure takes into account the life of the equipment on which it is installed. The EUL for an AOE cannot exceed the RUL for the source heating equipment.

2.1.9 WATER HEATING SHOWERHEAD

The claims in this Measure Group were covered by seven workpapers, including PGECODHW125-7, PGECODHW125-6, SCE17WP004.2, SWWH001-00, SCGWP100303A-5, WPSCGNRHW170412A-1, and WPSDGEREWH1061A-5. The claim NTG, EUL, and GSIA values were compared to workpaper values as part of the review for this measure group. A subset of the claims had the Measure Application Types (MAT) add-on equipment (AOE) which has somewhat complicated rules for selecting the correct EUL. Review of workpaper SCGWP100303A-5 found that the incorrect EUL of 6.67 years had been applied to these AOE measures. The EUL for this AOE measure should be one-third of the EUL listed in the workpaper. In this case, the workpaper cited 10 years, so the EUL should be updated to 3.33 years.

3   SPECIAL ISSUE/TRANSITION YEAR NOTES

PY2019 was a significant transition year for deemed savings system changes. It is the first year that many of the structural data changes required by DEER Resolution E-4952 were implemented such as new Measure Application Types (MATs), resetting of EULs for behavioral, retrocommissioning and operational (BRO) measures, and a new and overhauled NTG table (NTG 2020). There was also as non-routine, mid-year workpaper update for smart thermostat measures which required a closer look at installation dates versus workpaper effective dates.

3.1.1 Measure Application Types (MATs)

New MATs per E-4952 were effective 1/1/2019 as shown in Table 3. We obseWe did not have to check this because CEDARS validates the MAT value based on the. This is a field checked by CEDARS and changed in MATs changed Check the entire DNUM datset and report on what % used the old MATs, see table below. Custom programs were allowed an exception because some projects take multiple years to complete and are claimed in the year they are completed.

Table 3 DEER Support Table: New Measure Application Types for 2019

MeasAppType	MeasAppTypeDesc	startdate	expirydate
ER	Early retirement	1/1/2013	12/31/2018
ROB	Replace on Burnout	1/1/2013	12/31/2018
NC	New Construction	1/1/2013	
RC	Retro-Commissioning	1/1/2013	12/31/2018
RET	Retrofit	1/1/2013	12/31/2018
REA	Retrofit Add-On	1/1/2013	12/31/2018
ROBNC	ROB or NC	1/1/2013	12/31/2018
AR	Accelerated Replacement	**1/1/2019**	
NR	Normal Replacement (includes Replace on Burnout)	**1/1/2019**	
AOE	Add-on Equipment	**1/1/2019**	
BW	Building Weatherization	**1/1/2019**	
BRO-Bhv	BRO-Behavioral	**1/1/2019**	
BRO-RCx	BRO-Retrocommissioning	**1/1/2019**	
BRO-Op	BRO-Operational	**1/1/2019**	

3.1.2 E-4952 mass-change of EUL/RUL due to MAT=BRO

E-4952 changed a lot of measures from an existing MAT to a Behavioural, Retrocommissioning, and Operational (BRO) MAT, and along with that change the EUL\RUL changed drastically for several measures. Table 4 shows a small extract of the affected measures and the effective year for this change actually retroactive to 2017 by the previous deemed ex ante team though CEDARS only checks the EUL_ID not the actual EUL value. However, several generic BRO EUL_IDs were also created to replace the measure-specific EUL_IDs. These values are shown in Table 5 and going forward should be used instead of the measure-specific EUL_IDs.

Table 4 Measure EUL IDs that changed due to BRO resolution

EUL_ID	StartDate	ExpiryDate	EUL_Yrs	RUL_Yrs
BlrTuneup	1/1/2017		3	1
BlrTuneup	1/1/2013	12/31/2016	5	1.7
GrocDisp-FixtDrGask	1/1/2017		3	1
GrocDisp-FixtDrGask	1/1/2013	12/31/2016	4	1.3
GrocSys-Retro	1/1/2017		3	
GrocSys-Retro	1/1/2013	12/31/2016	10	
HVAC-DuctSeal	1/1/2017		3	
HVAC-DuctSeal	1/1/2013	12/31/2016	18	6

Table 5 Generic BRO Measure EUL IDs

EUL_ID	StartDate	ExpiryDate	EUL_Yrs	RUL_Yrs
NonRes-Behavioral	1/1/2017		2	
NonRes-RCx-Operational	1/1/2017		3	
Res-Behavioral	1/1/2017		1	
Res-RCx-Operational	1/1/2017		3	

3.1.3 Consolidation of PA-specific Workpapers

PA-specific workpapers historically resulted in having multiple workpapers for the same measure, which was readily apparent for the smart thermostat measure in PY2019 claims. However other Measure Groups and measures exhibited the more recent trend of one PA leading the workpaper developement and other PAs adopting the workpaper, as a first step towards the move to Statewide workpapers in PY2020. The move to statewide workpapers could make the DNUM review easier next year, but depends on the PA-level implementation of the statewide workpapers in their tracking systems. In addition, unlike previous years all measures required a workpaper so SourceDesc was always populated and there are no pure DEER measures. The DEER database only has energy savings values not costs and implementation (delivery type, etc.) parameters so all measures now require workpapers.

4 DELIVERABLES

1) This memo containing a general summary of the approach, review, and findings.
2) Recommended ex ante data changes workbook: *2019 ESPI DNUM Claim verification and updates.xlsx*

5 INTERNAL WORKING FILES

1) *2019 DNUM stats and tracker_populated.xlsx* Measure Group and workpaper summaries used to prioritize the DNUM review.
2) *DEER Verification kWH.xlsx* Electric Measure Group-level claim data and results of automated comparisons to DEER Support Table values and ex ante data review.
3) *DEER Verification kWH.xlsx* Gas Measure Group-level claim data and results of automated comparisons to DEER Support Table values and ex ante data review.