

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

ENERGY DIVISION

AGENDA ID # 20887  
RESOLUTION E-5221  
October 20, 2022

R E S O L U T I O N

E-5221. Approval of the Database for Energy-Efficient Resources updates for Program Year 2024-2025 and revised version for Program Years 2023 and 2022.

PROPOSED OUTCOME:

- DEER 2024 Update (effective January 1, 2024)
- Revise DEER2023 Update (effective January 1, 2023)
- Revise DEER2022 Update (retroactive to January 1, 2022)

SAFETY CONSIDERATIONS:

- There are no safety considerations associated with this resolution.

ESTIMATED COST:

- There are no costs associated with this resolution.

By Energy Division's own motion in Compliance with D.15-10-028.

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SUMMARY

This Resolution approves updates to the Database for Energy-Efficient Resources (DEER) for program year (PY) 2024 and a revised version of DEER for PY2023 and PY2022, in compliance with D.15-10-028, D.21-05-031,<sup>1</sup> and Resolutions E-4818, E-4952, E-5009, E-5082, and E-5152. This update also directs forward looking research and addresses significant transitions for the DEER and measure package system maintenance and operation.

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<sup>1</sup> <https://docs.cpuc.ca.gov/SearchRes.aspx?docformat=ALL&docid=385864616>

All updated DEER assumptions, methods, values, and supporting documentation are available on the DEER Module on the California Energy Data and Reporting System (CEDARS).<sup>2</sup>

## **BACKGROUND**

The Database for Energy Efficient Resources (DEER) contains information on energy-efficient technologies and measures. DEER provides estimates of the typical energy-savings potential for these technologies in residential and nonresidential applications. DEER is used by California Energy Efficiency (EE) Program Administrators (PAs), private sector implementers, and the EE industry across the country to develop and design energy efficiency programs.

The DEER database has a 30-year history, starting in the 1990s under the California Energy Commission (CEC) where responsibility for developing energy efficiency measure parameters was delegated to a broad stakeholder coalition. With the 2006-08 energy-efficiency (EE) portfolio cycle, the CPUC staff assumed responsibility for the DEER and began hosting it on the “DEEResources” suite of websites.

### **Relevant Regulatory Background**

The California Public Utilities Commission (Commission or CPUC) Decision D.15-10-028, Ordering Paragraph 17 states: “Commission staff shall propose changes to the Database of Energy Efficient Resources once annually via Resolution, with the associated comment/protest period provided by General Order 96-B. However, Commission staff may make changes at any time without a Resolution to fix errors or to change documentation.” D.15-10-028, retains the direction from D.12-05-015 that DEER values be updated for consistency with existing and updated state and federal codes and standards while incorporating these changes into the DEER update.<sup>3</sup> D.21-05-031 retains previous direction regarding CPUC staff latitude in updating DEER.<sup>4</sup> D.21-05-031 also adopts and Resolution E-5152 enacted a biennial update schedule for

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<sup>2</sup> <https://cedars.sound-data.com/deer-resources/>

<sup>3</sup> D.15-10-28, at 80, states “D.12-05-015 allowed additional mid-cycle changes if there are new state and federal codes and standards that affect DEER values. Specifically, the decision stated in Conclusion of Law 84: “We generally agree with parties’ request that ex ante values should be adopted and held constant throughout the portfolio cycle. However, mid-cycle updates of ex ante values are warranted if newly adopted codes or standards take effect during the cycle.”

<sup>4</sup> D.15-10-28, at 80, quotes from D.12-05-015: “Conclusion of Law 80 states: ‘Our Staff should have significant latitude in performing DEER and other policy oversight functions and, absent specific directives to the contrary, should not be required to consult with or otherwise utilize any other groups to perform this work.’”

DEER, eliminates the DEER and non-DEER distinction for EE measures, and redefines the scope of the DEER resolution to:

a) lock down the version of ex ante EE values used for planning and claims; b) direct research to inform future DEER updates; and c) manage deemed ex ante processes.

Resolution E-5082 initiated the transition of existing DEER and measure package systems to a software platform jointly co-funded by the IOUs called the Electronic Technical Resource Manual (eTRM)<sup>5</sup> and conferred conditional designation “data source of record” to the eTRM.<sup>6</sup> Resolution E-5082 also outlined a schedule and benchmarks for the phased transition from DEER to the eTRM as the new “data source of record” for the typical deemed energy savings values for energy efficiency measures.

In addition, Resolution E-4952<sup>7</sup> (DEER2020), adopted on October 11, 2018, clarified and specified issues in Resolution E-4818,<sup>8</sup> adopted on March 2, 2017. Among other things, these resolutions ordered many significant changes including guidance on the peak demand period, building prototypes, and measure analysis software control (MASControl3) updates.

### **Timing and Applicability of DEER Updates**

DEER updates flow into the EE portfolio development process by providing new deemed energy savings estimates and other EE measure parameter updates for program design. New energy savings estimates, and underlying assumptions, methods, and values inform the direction of energy efficiency programs. These allow program administrators to shift program eligibility requirements and incentive support mechanisms to deliver the most reliable, cost-effective energy savings. DEER updates may also reflect new market conditions. The PAs are required to ensure new assumptions and values are incorporated into the next cycle of EE programs by considering a) when the next update is planned, b) the fundamental assumptions for the update, and c) whether shifts to their programs to capture cost-effective savings are needed. Updates to DEER methods apply to EE technical measure package development and custom project energy savings estimates as well as program delivery decisions.

The terminology “DEERxxxx” is used to designate the version of updated parameters and is independent of the conversion to using eTRM. The year shown reflects the program year that a given update takes effect. Beginning January 1, 2022, DEER no

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<sup>5</sup> <https://www.caetrm.com>

<sup>6</sup> <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M346/K161/346161639.PDF>

<sup>7</sup> <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M232/K459/232459122.PDF>

<sup>8</sup> <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M179/K264/179264220.PDF>

longer referred to the ExAnte and Preliminary Ex Ante Review (PEAR) databases since these data now reside in the eTRM.

### **Scoping Document and Updates for DEER2024 and Revised DEER2023/DEER2022**

On May 4, 2022, the CPUC Energy Division released for public comment a Scoping Document outlining the proposed issues and updates to be addressed in this DEER resolution. The Scoping Document described the various issues that may be considered in this resolution and the rationale for why these issues need to be addressed. Seven stakeholders, including all four investor-owned utilities (IOUs), submitted comments on the Scoping Document.<sup>9</sup> Below are the issues raised most frequently in the comments:

- Research regarding the high-SEER heat pump and air conditioning performance curves
- Structuring the EnergyImpact and Measure tables in the DEER database
- Updates to the Delivery Types
- Aggregated values in permutations
- Budget/staff implications to shift historic DEER measure modeling to PAs

In consideration of the comments to the Scoping Document, the topic areas addressed in this DEER update are summarized in Table 1. The policy guidance for these updates is described in the Discussion section that follows. A more detailed technical description of the changes and additions is provided in Attachment A to this Resolution. Complete documentation and supporting material on the updated assumptions and methods and updated DEER elements such as database tables, calculators, and web pages are available at the DEER Module on CEDARS.<sup>10</sup>

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<sup>9</sup> The Scoping Document for DEER2024 Update was posted on May 4, 2022 and located at: <https://pda.energydataweb.com/#!/documents/2623/view>.

<sup>10</sup> Supporting material is at <https://cedars.sound-data.com/deer-resources/tools/supporting-files/resource/2/history>

**Table 1. DEER2024 Update**

Priority	Effort	DEER Version	Update Topic Area	Sector		Measure/Tech Group						Forecasted Value				
				Res	Non-Res	Lighting	HVAC	DHW	Envelope	Plug/Process	UES	NTG	EUL	Measure Cost	Other	
Management of DEER Processes																
!!!!	\$\$\$\$	2024	A. Transition to Electronic Technical Reference Manual (eTRM)	X	X	X	X	X	X	X	X	X	X	X	X	X
!!!!	\$\$\$\$	2024	B. Updates to eTRM and Measure Packages	X	X	X	X	X	X	X	X	X	X	X	X	X
!!!!	\$\$	2024	C DEEResources Website Content Migrated to CEDARS	X	X	X	X	X	X	X	X	X	X	X	X	X
!!!	\$\$\$	2023	D. PAs Responsible for Modeling DEER and Historically Non-DEER Values	X	X	X	X	X	X	X	X	X	X	X	X	X
!!!!	\$\$\$\$	2026	E. DEER 2026 Update and Measure Package Submission/Review Timeline	X	X	X	X	X	X	X	X	X	X	X	X	X
!!!	\$\$\$	2024	F. Measure Lifecycle Management in DEER	X	X	X	X	X	X	X	X	X	X	X	X	X
!!!!	\$	2024	G. Mid-Cycle Adjustments to the Locked Ex-Ante Values	X	X	X	X	X	X	X	X	X	X	X	X	X
!!!!	\$\$\$\$	2024	H. EnergyPlus Prototypes, Residential	X		X	X	X	X	X	X					
!!!	\$	2021	I. PY2021 Evaluator Guidance	X	X	X	X	X	X	X	X	X	X	X	X	X
!!	\$	2024	J. Hard-to-Reach/Direct-Install Net-to-Gross Ratios	X	X	X	X	X	X	X		X				
!!	\$\$	2024	K. Fuel Substitution Calculator Updates	X	X		X	X	X	X						X
!!	\$	2023-2024	L. Add-On-Equipment (AOE) Host Clarification	X	X	X	X	X	X	X						X
!!	\$\$	2024	M. Structural Changes to DEER Tables	X	X	X	X	X	X	X		X	X			X
!!!	\$	varies	N. Updates to DEER Support Table Values	X	X	X	X	X	X	X		X	X			X
Research Needs for PY2026-27																
!!!!	\$\$\$\$	2026	O. EnergyPlus Prototypes, Commercial		X	X	X	X	X	X	X					
!!!!	\$\$	2026	P. Research to Improve Water Heater Measures	X	X			X			X					
!!!	\$\$	2026	Q. Net-to-Gross Ratio for Hard-to-Reach Customers	X	X	X	X	X	X	X		X				
!!!!	\$\$\$	2026	R. High-SEER Heat Pump and AC Performance Curves	X	X		X				X					
!!!!	\$\$	2026	S. Boiler Compliance with Condensation of Exhaust Gasses and Associated EE Assumptions	X	X		X	X			X					
Measure Adoption																
!!!	\$	2024-2026	T. Guidance Based on Industry Standard Practice Studies	X	X		X	X			X					
!!!	\$	2024	U. Guidance from 2019 Custom Industrial, Agricultural, and Commercial Impact Evaluation Review		X	X	X	X	X	X		X				
!!!!	\$\$\$	2024	V. Guidance from Evaluation, Measurement and Verification (EM&V) Review	X	X		X	X	X		X	X	X			

## **DISCUSSION**

Pursuant to D.15-10-028, the Energy Division published a DEER Update Scoping Document on the proposed list of updates for DEER2024 and revised DEER2023 and DEER2022 items on May 4, 2022. The list of topic areas that this Resolution will incorporate are summarized below and described in detail in Attachment A, DEER2024 Update Summary.

### **Management of DEER Processes**

#### **A. Transition to Electronic Technical Reference Manual (eTRM)**

##### *A.1 IOU Budgets for 2023 eTRM and CalTF Support*

In Resolution E-5152,<sup>11</sup> we directed the IOUs to include budgets for eTRM development and California Technical Forum (CalTF) support of new measure development needs in their 2022-23 Annual Budget Advice Letter filings, with a short description and table illustrating the proposed budgets in the narrative so that CPUC staff can understand and approve the budgets along with the other forecasted activities for 2022. Section A.4 of Resolution E-5152 also required the PAs to include funding for the eTRM in their Business Plan applications. This contracting and funding model has been demonstrated to be effective and should continue.

##### *A.2 Ownership and Financial Responsibility of eTRM 2023 and Beyond*

The Energy Division has oversight of ex ante values and methodologies, including measure review and processes supported by the eTRM; however, the eTRM contracting process to date has provided a model for IOU funding of EE resources that enables them to fund the eTRM from their EM&V budgets and administer the eTRM as activities within their Business Plans.

Resolution E-5082<sup>12</sup> Ordering Paragraph 6 required the IOU Funders to administer and maintain the eTRM without changes to contract management structure until completion of both Phase 1 and Phase 2 activities. Since both phases are completed, the IOUs are authorized to alternate eTRM contract management responsibilities to another IOU, and to manage software maintenance and development contracts as needed.

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<sup>11</sup> <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M398/K106/398106298.PDF>

<sup>12</sup> <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M346/K161/346161639.PDF>

## B. Updates to eTRM and Measure Packages

Effective Program Year: 2022. California's statewide electronic Technical Reference Manual (eTRM) is the *Official Source of California Energy Efficiency Measure Data*,<sup>13</sup> and with the release of Version 2.3 in March of 2022, is now the sole source for energy efficiency measure package development, submittal, review, and publishing. Measure developers shall follow the rules and procedures as laid out in the documents provided by CalTF as they move measures through the development phase prior to submittal.

### B.1 eTRM Table Structure Changes

Additional fields shall be added to the eTRM measure permutations table as needed to support measure development. These fields may result from fields added to the DEER support tables or they may be in addition to DEER support table fields. Measure developers shall work with CalTF to identify those fields and communicate a process whereby the permutation tables will be changed to accommodate the new data. Where the new fields and associated data impact DEER support tables, CEDARS, or CET, the CPUC staff will review and approve necessary changes to meet these needs. Examples of such fields include but are not limited to: Refrigerant Avoided Costs (RACC), ex ante annual water savings, in gallons (one for indoor water savings and a second for outdoor water savings), low-Global Warming Potential (GWP) refrigerants, and water-energy nexus (WEN) direct energy savings.

### B.2 Refrigerant Impacts (RACC)

Per D.21-05-031 and Resolution E-5152, starting in PY2022 the reporting of refrigerant leakage avoided costs (RLAC) is required for all energy efficiency measure claims as calculated from the CPUC's Refrigerant Avoided Cost Calculator (RACC)<sup>14</sup> for measure packages where the retrofit involves adding (not replacing) equipment that uses refrigerant—these include fuel substitution and electric resistance to heat pump measures—or where low-GWP measure benefits will be claimed.

The RACC does not presently have a means to determine avoided refrigerants for dual baseline implementations. The CPUC considered and analyzed various work arounds to this issue and concluded that treating accelerated replacement (AR) measures as normal replacement (NR) measures was the best option at this time. We direct that in the RACC, accelerated replacement (AR) measures shall be treated the same as normal replacement (NR) measures until the RACC is revised. PAs shall continue to work with CPUC staff to update the RACC to include the calculations for AR measures and align with the 2022 update to the avoided costs by June 1, 2023. Measure developers will need

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<sup>13</sup> <https://www.caetrm.com/>

<sup>14</sup> <https://cedars.sound-data.com/deer-resources/tools/supporting-files/resource/2/history>

to submit the updated RACC for applicable measure packages thereafter. These updates will be outlined in the Measure Lifecycle Management table, see Section F. PAs are to use the most recent version of the calculator for all off-cycle new Measure Package submissions. Guidance on where to submit the addendums can be found on CEDARS at [Guidance for Deemed Measures - CEDARS](#).<sup>15</sup>

CPUC Decision D.21-05-031 section 8.1 allows program administrators to collaborate with CPUC staff for developing normal replacement measures within energy efficiency programs to encourage low-GWP refrigerants. The Decision specifies “...we will set normal replacement baseline to be either the current regulation, or the refrigerant typically used for similar applications in program years 2020-2021, whichever has lower refrigerant emissions. Given the market uncertainty, we will revisit this baseline policy in 2025.” The refrigerant baseline may be updated for program year 2026.

### *B.3 Aggregated Values in Permutations*

A review of eTRM permutations found that aggregated values (e.g., “Any”, “Res”, “Com”) were in use when more accurate deemed savings were available and should have been used. We clarify that aggregated values shall only be used in some fields of the permutations table under a limited set of conditions as described in Attachment A.

### *B.4 Water-Energy Nexus (WEN) Impacts*

In December 2021 we released the new Water-Energy (W-E) Calculator 2.0.<sup>16</sup> The new calculator replaces W-E Calculator 1.0 and is to be used to calculate the embedded energy savings for Water-Energy Nexus (WEN) energy efficiency measures starting PY2023 for existing measures. To improve the traceability of embedded energy savings from measures that save water, W-E savings are no longer to be reported in a single rolled-up measure package (SWMI001); instead, the WEN calculated savings are to be included with each measure package involving water savings. PAs can now add the embedded energy savings to the direct energy savings from these WEN measures to claim incentives which will count towards PAs’ energy efficiency goals.

On December 22, 2021, CPUC staff issued a guidance memo describing a short- and long-term solution for how the embedded energy savings outputs of the W-E Calculator 2.0 must be calculated and integrated into the measure package, eTRM, CEDARS, and CET, see Appendix A4. We adopt this guidance memo. PAs are to use the most recent version of the calculator for all off-cycle new Measure Package submissions. Guidance

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<sup>15</sup> <https://cedars.sound-data.com/deer-resources/deemed-measure-packages/guidance/resource/8/history>

<sup>16</sup> <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/demand-side-management/energy-efficiency/water-energy-nexus-programs>



on where to submit the addendums can be found on CEDARS at [Guidance for Deemed Measures - CEDARS \(sound-data.com\)](https://cedars.sound-data.com/guidance-for-deemed-measures).

#### B.5 *Rebates Exceeding Incremental Measure Cost (IMC)*

In 2020, CPUC staff released an *Addendum to Fuel Substitution Workpaper Documenting Incentive Greater than Incremental Measure Cost*.<sup>17</sup> The purpose of this addendum was to provide a pathway for PAs to inform the CPUC staff of the need to offer rebates to the customer that exceeds the net cost to the participant of installing more efficient equipment. We adopt this guidance memo.

On June 2, 2022, CPUC staff released an updated guidance document *Addendum to Measure Package Documenting Incentive Greater than Incremental Measure Cost*, see Appendix A4. We adopt this guidance memo. The guidance included the following:

- Update to include eligibility of all measures.
- Update to change the term workpaper to measure package.
- Update title of document “Addendum to Measure Package Documenting Incentive Greater than Incremental Measure Cost”.
- Added directions for posting addendum to the measure log for referenced measure package.
- Added third party to Incentive Requirements narrative.
- Removed PA contact information

#### B.6 *Measure Cost Updates*

Currently measure costs are reviewed for necessary updates as measure packages are revised. As directed in Section F, measure costs shall be updated as measure packages are revised in accordance with the Measure Lifecycle Management table, see Section F. In addition, to ensure that measure costs stay current they will be revised no less frequently than every four years using methods described in CalTF’s whitepaper on cost updates for measure package updates.<sup>18</sup>

#### B.7 *Data Requirements for Distributor/Contractor-delivered Measures*

Multiple evaluation reports have recommended improvements in documentation quality for measures delivered via midstream and upstream channels to meet measure verification evaluation requirements per the California Evaluation Protocols.<sup>19</sup> Since

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<sup>17</sup> <https://cedars.sound-data.com/deer-resources/deemed-measure-packages/guidance/>

<sup>18</sup> <https://static1.squarespace.com/static/53c96e16e4b003bdba4f4fee/t/5f99c8d60e9651515f53a3db/1603913944726/Cal+TF+White+Paper+Cost+Analysis+Methods+Affirmed+2020.09.24++v1.0.pdf>

<sup>19</sup> The [California Evaluation Protocols](#), p. 57 states that Basic Rigor Verification involves physical inspection of the installation to verify correct measure installation and installation quality.

these recommendations have not been sufficiently acted upon, we direct that data requirements must be added to measure packages updated for PY2023 and PY2024 for all offerings using the UpDeemed delivery type. At a minimum the data collected must be sufficient to allow an evaluator to locate the installed equipment that received a rebate. These include:

- Site Identifier – A unique identifier for the shipped location (upstream) or installed location (midstream) of the incentivized equipment (e.g., site address)
- Equipment Identifier - A unique identifier for each unit of incentivized equipment (e.g., serial number)
- Quantity per sales transaction, project, or site – Total units of incentivized equipment located at the site or project

Additional data requirements for specific measure packages may be required for inclusion and will be addressed as part of the measure package review process.

#### C. DEEResources Website Content Migrated to CEDARS

Effective Program Year: 2022. Due to security vulnerabilities identified by the CPUC, all content from the DEEResources.com and DEEResources.net websites was migrated to the DEER Module at CPUC’s CEDARS website.<sup>20</sup> We clarify here that no new content will be uploaded to DEEResources.com; new content will only be added to DEEResources.net in rare instances and until it can be uploaded to the CEDARS DEER Module.

#### D. PAs Responsible for Modeling DEER and Historically Non-DEER Values

Effective Program Year: 2026. Decision D.21-05-031 eliminated the DEER and non-DEER distinction and clarified that all deemed ex ante values approved by staff and housed in the existing DEER systems, and ultimately in the eTRM, are considered DEER values.”<sup>21</sup> Because of this change, there is no longer a compelling reason for these historically DEER measures to be modeled by the CPUC. Shifting this work to the PAs will allow CPUC staff to devote more time to—and elevate the rigor of—the review of measure package submissions by:

- Ensuring that the UES values are based on valid assumptions

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<sup>20</sup> <https://cedars.sound-data.com/deer-resources/>

<sup>21</sup> D.21-05-031, “Assessment of Energy Efficiency Potential and Goals and Modification of Portfolio Approval and Oversight Process,” adopted 2021-05-20, p. 38.

- Verifying that policy guidance from the CPUC is appropriately interpreted and applied
- Scrutinizing building model inputs to improve the accuracy of UES values

Starting with PY2026 measure packages, the entire responsibility for calculating the UES values for all deemed measures is shifted to the measure package developers. CPUC staff will continue to develop and maintain the DEER building simulation tools and the DEER water heater calculator. Tools and methods will be fully documented and supported. CPUC staff will also continue to be responsible for critically reviewing all UES values for deemed measures.

#### E. DEER 2026 Update and Measure Package Submission/Review Timeline

This resolution sets forth the schedule for DEER Update and for submission of measure packages for CPUC staff approval for PY2026-27. The timeline and schedule are provided in Table 2 and Table 3.

**Table 2. PY2026-27 DEER Update Cycle Timeline**

Description	Responsible Party	Due Date	Approval Date	Effective Date
Measure Package Update Schedule	PAs/ Stakeholders	2023-08-01**	-	-
Measure Package Submittals	PAs	See Table 3	2024-08-01 <sup>+</sup>	2026-01-01*
Draft DEER2026 Update Resolution	CPUC	2024-08-01	-	-
DEER2026 Update Resolution	CPUC	-	2024-11-01	2026-01-01*

\* There may be exceptions when updates become effective off-cycle.

\*\* Draft for workflow scheduling. Updates to the schedule may be made if needed.

+ Per Draft Resolution release, adoption in Final Resolution

CPUC staff will work with PAs to set a prioritized schedule of updates for all PY2026-27 measure packages resulting from updates directed in the Measure Lifecycle Management (further described in Section F) and Research Needs for PY2026-27. PAs may submit additional updates to measure packages beyond what is directed and may include additional measure packages for update during that time. Only measure packages adopted in the future resolution for DEER2026 will be included in the set of deemed measures for the PY2026-27 program cycle.

Controversial measure packages must be submitted well before the standard three-month timeframe for review and approval to avoid delays. It is the responsibility of the PAs to follow the agreed schedule for submissions or risk measure packages not being included in the DEER resolution and therefore not receiving approval.

Table 3 summarizes the measures presently planned for updates and the deadline for PA measure package submittals.

**Table 3. Timeline for DEER2026-27 Measure Package Updates from CPUC-Led Research**

End Use Category	Update Detail	Research Data Needed By	PA Measure Package Submittal By
Commercial Refrigeration (CR)	Commercial refrigeration EnergyPlus updates per Section N	2023-12-01	2024-03-31
HVAC (HC)	Commercial weather-dependent EnergyPlus updates per Section N	2023-12-01	2024-03-31
Water Heating and Water Pumping (WH)	Water Heater Measure Update per Section O	2023-12-01	2024-03-31

Table 4 summarizes the measures presently planned for updates, when the PA-led research is due, and the deadline for the PA measure package submittals.

**Table 4. Timeline for DEER2026-27 Measure Package Updates from PA-Led Research**

End Use Category	Update Detail	PA Research Data Needed By	PA Measure Package Submittal By
HVAC (HC)	High-SEER performance curves for HPs/ACs per Section Q	2023-12-01	2024-03-31
Water Heating (WH)	Condensing boiler operating efficiencies per Section R	2023-12-01	2024-03-31

#### F. Measure Lifecycle Management (MLM) in DEER

Effective Program Year: 2024. PAs shall work with CalTF to maintain a Measure Lifecycle Management (MLM) table to track existing and planned updates to current and future measure packages. This table is intended to help manage measure package updates in a more strategic manner and space them out over time to minimize highly compressed measure package update and review periods. The table will also be used to

identify those measure packages that need new research to inform planned updates. In addition to the Statewide Measure ID, end use, and technology group, the table will track characteristics of each measure package as identified in Table 5. For each characteristic listed—including the characteristic itself—the dates each was last updated and is next expected to be considered for update will be tracked. CPUC staff will retain responsibility for approving the MLM table.

**Table 5. Measure Package Characteristics Tracked for Measure Lifecycle Management**

Characteristic	Description
PAlead	Lead program administrator for measure package
FuelType	Predominant fuel type saved by technology (e.g., electric, natural gas)
WeatherFile	For weather-sensitive measures, the TMY weather file used (e.g., CZ2022)
CodeStd	Relevant building code or appliance, ENERGY STAR®, or CEE standard
ISPref	Report to determine industry standard practice used for most recent update
Refrigerant	Flag to indicate measures that contain refrigerant
EULref	Report used for most recent EUL update
NTGref	Report used for most recent NTGR update
Costref	Report used for most recent cost update
EntryYear	First year measure became available for tracking when availability exceeds two years
CPUCmgmt	Flag indicating whether senior management at the CPUC will need to review

#### G. DEER Off-Cycle Adjustments to the Locked Ex-Ante Values

D. 21-05-031 (p. 39) locks ex-ante (i.e. expected) energy savings values that will be used in the Energy Efficiency next Potential & Goals Study as well as claims for the two-year DEER cycle, beginning with years 2024-25. It further notes that there may be off-cycle adjustments that will account for reasonable corrections to the existing locked values and allow new measures to be added to the portfolio. PAs may still submit new measures during the cycle, but ex ante values adopted in DEER2024 will remain locked. Off-cycle error corrections (i.e., correction of typographical and clerical errors, and other obvious, inadvertent errors and omissions) will be handled on a case-by-case basis and consider their impact to the portfolio. Building upon Resolution E-5152, these off-cycle adjustments are further clarified below.

### *G.1 New Measures*

New measure packages and measure packages that solely include the addition of new measures may be submitted for CPUC staff review at any time during the biennial cycle and must follow the submittal, review, and approval process outlined in Resolution E-5152 (p. 13). Newly approved ex ante values adopted into the portfolio are not subject to an effective date 90-day after approval. Instead, they will become effective upon approval and can be used for off-cycle claims. Notification of new measure packages or new measures added to existing measure packages will be communicated to stakeholders through CPUC staff measure package dispositions, eTRM published values, DEER support tables, and/or stakeholder meetings.

### *G.2 Error Corrections*

Reasonable error corrections to DEER and measure packages (i.e., “correction of typographical and clerical errors, and other obvious, inadvertent errors and omissions.”)<sup>22</sup> can occur at any time during the biennial cycle, shall become effective immediately. As stated in E-5152, “such errors will be handled on a case-by-case basis and assessed based on their impact to the portfolio.” Notification of reasonable error corrections shall be communicated to stakeholders through CPUC staff measure package dispositions, eTRM published values, guidance documents, DEER support tables, DEER change log, and/or stakeholder meetings.

Error corrections that are egregious and have a large impact to the savings portfolio or claims (i.e., NTG values, measure eligibility requirements, or other measure packages requirements that can retroactively impact potential savings claims) may be allowed only on a very limited basis and will be handled case-by-case. CPUC staff shall hold the authority to decide whether an off-cycle update is considered critical in these circumstances. This will be communicated to stakeholders through CPUC staff measure package dispositions, guidance documents, eTRM published values, DEER support tables, DEER change log, and/or stakeholder meetings.

### *G.3 Codes and Standards*

Anticipated changes to codes and standards that occur off-cycle shall be planned for and proceed as outlined in the Measure Lifecycle Management table, see Section F. Uncertain or unanticipated changes to codes and standards that occur off-cycle will require a revised Measure Package baseline and become effective 90 days after the Measure Package is approved. Voluntary standards such as ENERGY STAR® may also require a revision to the baseline or measure values.

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<sup>22</sup> Resolution A-4661, Orders Correcting Errors in Commission Decisions (March 9, 1977) is available on the Commission website at: <https://docs.cpuc.ca.gov/PublishedDocs/PUBLISHED/Graphics/96168.PDF>

## H. EnergyPlus Prototypes, Residential

Effective Program Year: 2024. CPUC staff has completed the transition to EnergyPlus prototypes for residential measures with the set of residential weather dependent measures listed in Table 6 that will be adopted as part of this DEER2024 update. The draft CPUC methodology documentation was publicly reviewed, changes were made to the prototypes and the models were recalibrated. The final documentation is posted on CEDARS.<sup>23</sup> The transition of commercial measures is upcoming, may also include a revision of the residential prototype models, and is described in Section O.

**Table 6. Measures Transitioned to EnergyPlus Prototypes**

Measure ID	Measure Name
SWHC027	Package Terminal Air Conditioner or Heat Pump, Under 24 kBtu/h
SWHC029	Fan Controller for Air Conditioner, Residential
SWHC030	Whole House Fan, Residential
SWHC031	Furnace, Residential
SWHC044	Ductless HVAC, Residential, Fuel Substitution
SWHC049	SEER Rated AC and HP HVAC Equipment, Residential <sup>24</sup>
SWSV001	Duct Seal, Residential
SWSV013	Duct Optimization, Residential
SWBE006	Ceiling Insulation, Residential
SWBE007	Wall Insulation, Residential
SWHC038	Brushless Fan Motor Replacement, Residential
SWHC050	Ductless Heat Pump, Residential
SWWH028	Heat Pump Water Heater, Commercial and MF, Fuel Substitution

## I. PY2021 Evaluator Guidance

Effective Program Year: PY2021. Due to the transition to eTRM as the data source of record in PY2022 and the resulting transition year in PY2021 we clarify the location of the official ex ante values during the transition period. Evaluators of PY2021 programs that delivered deemed measures are directed to use the Ex Ante Data (EAD) Tables that accompany each measure package as the data source of record for ex ante UES values rather than eTRM's permutations. These EAD tables may be found on the CEDARS

<sup>23</sup> <https://cedars.sound-data.com/deer-resources/tools/energy-plus/resource/10/history>

<sup>24</sup> This measure will include SEER 19-21 equipment.

Deemed Measure Archive.<sup>25</sup> There is one exception to this guidance for measures that were developed, submitted, and approved at the end of 2021 using only eTRM permutations (i.e., no EAD tables were produced or reviewed). Table 7 lists the measure package that falls under that exception:

**Table 7. PY2021 EM&V Exceptions for Measure Savings Evaluation**

Measure ID	PA Lead	Measure Name
SWWH011-01	PG&E	Central Storage Water Heater, Multifamily

Starting in PY2022, evaluators are directed to use the ex-ante UES values provided in permutation tables contained within measure packages published in eTRM.

#### J. Hard-to-Reach (HTR)/Direct-Install Net-to-Gross Ratios

Effective Program Year: 2022. Due to confusion regarding the applicability of the higher NTG ratio value for HTR customers we clarify here that the 0.85 NTG ratio for HTR customers in California only applies to HTR customers as defined in D.18-05-041, Section 2.5.3 and must use a direct install (DI) delivery channel. We adopt in Section N of this resolution three additional measure application types (MATs) that are eligible to use the HTR-DI NTGRs. We also clarify the definition of the direct-install delivery channel.

#### K. Fuel Substitution Calculator Updates

Effective Program Year: 2026. CPUC staff may be updating the Fuel Substitution Technical Guidance Document and Fuel Substitution Calculator as soon as the summer of 2023. If available, the updated calculator shall be used beginning in 2024 to update all fuel-substitution measure packages to become effective for PY2026-27. PAs are to use the most recent version of the calculator for all off-cycle new Measure Package submissions. Guidance on where to submit the addendums can be found on CEDARS at [Guidance for Deemed Measures - CEDARS \(sound-data.com\)](https://cedars.sound-data.com/deer-resources/deemed-measure-packages/measure-package-archive/).

#### L. Add-On-Equipment (AOE) Host Clarification

Effective Program Year: 2023-2024. An AOE measure is defined as improving the nominal efficiency of the host equipment (upon which it is installed) and the host equipment is defined as the equipment that uses less energy due to the add-on measure.<sup>26</sup> This resolution clarifies the definition of the host equipment by adding that some AOE measures reduce the load, or energy usage, on the host equipment. Further,

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<sup>25</sup> <https://cedars.sound-data.com/deer-resources/deemed-measure-packages/measure-package-archive/>

<sup>26</sup> [Resolution E-4818](#), Section 1.3.6.2 Add-On Equipment, pp. 26-27.



the measure life of an AOE and the introduction of a host proxy is discussed in more detail in Attachment A.

Ceiling, wall, or floor insulation as well as greenhouse heat curtains and infrared film shall no longer be considered AOE and are reclassified as the building weatherization (BW) measure application type.

#### M. Structural Changes to DEER Tables

To improve both the traceability of updates made to deemed savings and the reporting verification abilities of CEDARS, we direct the following changes to the structures of some new and existing DEER database tables.

- A new table, “FuelSub”, will categorize the types of fuel substitution measures to accommodate the transition to the Total System Benefit calculations.
- A new table—serving as a companion to the NTG\_2020 table—will clarify when a given NTG ID may be used. The eTRM and CEDARS shall synchronize with this new companion table nightly.
- A new table—serving as a companion to the EUL basis table—will clarify when a given EUL ID may be used. The eTRM and CEDARS shall synchronize with this new companion table nightly.
- CPUC staff will add two new fields to the Measure Table: WeatherSim and FuelSub\_ID.
- CPUC staff will add six new fields in DEER’s EnergyImpact table to accommodate updates to load shapes. The contents of four fields that are no longer in use will be deleted.

#### N. Updates to DEER Support Table Values

To accommodate policy clarifications and improve the evaluability of reported claims, we direct the following changes to the DEER support table values.

- Expand the allowed MATs for HTR-DI NTGRs from Normal Replacement (NR) or Accelerated Replacement (AR) to also include Add-on Equipment (AOE) and Building Weatherization (BW) MATs. Retro-commissioning measures (BRO-RCx) may also be categorized as being direct install if the vendor, as part of the program, performs the installation. Whether a given measure is categorized as direct install will need to be determined on a case-by-case basis by CPUC staff.
- Updates to Delivery Types to provide more detail for upstream delivery types, and to drop the distinction between deemed and custom measures since Measure Impact Types already account for whether measures are deemed or custom.

- New Measure Impact Types (MITs) are added for use starting in program year 2022 since Normalized Metered Energy Consumption and Strategic Energy Management program measures that involve fuel substitution require their own MITs for claims in PY2022-2025. The MITs will be consolidated in 2026 since there will no longer be a distinction between DEER and non-DEER measures and a FuelSub\_ID field will be added to the Measure table.
- All NTGRs resulting from CPUC staff's evaluation, measurement, and verification (EM&V) studies and approved via dispositions shall be rounded to the nearest 0.05 in DEER. NTGRs results from EM&V studies shall only be updated in DEER when the EM&V NTGR (before rounding) is at least 0.05 different from the current DEER value. If a new EM&V study determines that an existing and active measure-specific NTGR is—after rounding—equal to the relevant default NTGR, the measure-specific NTGR will be expired.

### **Research for PY2026-27**

The CPUC's future research plans center around forecasting important updates that will have significant impact on deemed measure savings.

#### **O. EnergyPlus Prototypes, Commercial**

The transition to EnergyPlus prototypes for commercial measures is anticipated to be completed by December 2023. These new commercial building prototypes will be released as available so they can be used for new measures and for PY2026-27 measure updates. CPUC staff will update the grocery and refrigerated warehouse prototypes and the refrigeration system performance curves. Refrigeration equipment performance curves used by the current DEER prototype are out of date.

#### **P. Research to Improve Water Heater Measures**

CPUC released a new version of the water heater calculator, "DEER Water Heater Calculator v5.0.xlsm," on January 24, 2022. We adopt this version of the calculator that encompassed the following updates:

- Residential hot water profiles using data that had been gathered and analyzed to inform the California Energy Commission (CEC) residential code compliance software (research version)<sup>27</sup> for the 2022 update to Title 24
- Heat pump water heater (HPWH) performance curves

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<sup>27</sup> The software package is titled *CBECC-Res 2022 (RV)*.

- Water heater sizing methodology and TechIDs using recent American Heating and Refrigeration Institute (AHRI) product data
- Embedded macro enabling users to save 8,760 load shapes to a comma-separated value (csv) file format

CPUC staff will add features to the water heater tools. Future updates that are under consideration involve HPWHs and include:

- Account for HPWHs located in conditioned spaces; presently HPWHs are assumed to be in unconditioned spaces.
- Investigate the proportion of the time that the HPWH uses electric-resistance water heating and update sizing requirements to minimize use of electric resistance mode. The amount of water heating generated in electric resistance mode for measure offerings will be determined.
- Investigate how the efficiency of HPWH is influenced by hot water temperature setpoint.

#### Q. Net-to-Gross Ratio for Hard-to-Reach Customers

Resolution E-4952 called into question the use of a higher NTGR for HTR customers. At that time, CPUC staff did not examine data specific to HTR customers, but instead CPUC staff used customer size as a proxy and assumed that smaller businesses would more likely be HTR customers.

Further research is needed to characterize the appropriate NTGR for residential and commercial HTR customers—in addition to those served through direct installation of measures—but also those served through downstream delivery mechanisms. The focus of the work would be to see if there is evidence for:

- A higher NTGR for HTR customers served through DI compared to non-HTR customers served through DI
- A higher NTGR for HTR customers served through downstream compared to non-HTR customers served through downstream

Primary research designed to inform NTGR values to use for HTR customers is needed. We direct CPUC staff to conduct this research. This work could go further to investigate HTR customer participation rates and depth of savings to assess whether HTR customers have equitable access to energy efficiency programs. The NTG research is to be completed by December 2023 and the results will be used to inform measure packages used for the PY2026-27 cycle.

R. High-SEER Heat Pump and AC Performance Curves, Non-residential and Residential

Although many high-SEER, inverter-driven heat pumps systems are being installed and claimed as fuel substitution measures under ratepayer-supported PA programs, CPUC staff identified gaps in the understanding of their field performance. We direct the PAs to conduct research to inform parameter updates to high efficiency equipment using inverter driven compressors with variable refrigerant flow (unitary, conventional split, and mini-split systems with and without heat recovery). The research shall involve equipment that has been redesigned to comply with the new Department of Energy unitary air conditioner and heat pump appliance standards effective January 1, 2023. This data is required to inform performance curves used in modeled unit energy savings and the development of load shapes.

The limitations of existing measure development tools to capture benefits of heat recovery capabilities of high efficiency variable flow heat pumps preclude the broad inclusion of these measures in the EE portfolio. Research to assess EnergyPlus performance curves to see if they adequately capture actual performance of variable flow heat pump systems is necessary to inform changes in modeled energy savings. Further research is also required to characterize performance curves of equipment utilizing low-GWP refrigerants that are starting to emerge in the market.

This work shall leverage data collected using the new DOE Variable Refrigerant Flow test procedures (based on AHRI 1230-2021) and involve collaboration with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard Project Committee 2059 to support the gathering of equipment performance data and additional data sources for informing the development of new performance curves.

The results of this research are needed by December 2023 to inform PY2026-27 updates to measure packages.

S. Boiler Compliance with Condensation of Exhaust Gasses and the Associated Energy Efficiency Assumptions

Although the CPUC staff has approved measure packages for condensing boilers, it is necessary to verify that they operate in a mode where the return water temperatures are low enough to allow for condensing of water vapor in the exhaust gases. For a boiler to run in condensing mode, the return water temperature must be below 140°F. We direct the CPUC staff to conduct this research to inform updates to measure packages by answering the following questions:

- Do the boiler measure requirements preclude condensing operation in some installation cases?

- Are boiler outside-air reset temperature controls inadvertently precluding condensing mode? In other words, does raising the setpoint during cold weather result in returning water to the boiler that is too warm to facilitate condensing?
- Is commissioning in the field verifying that return water temperatures are low enough for the boiler to operate in condensing mode?
- What boiler applications are most or least likely to achieve condensing efficiency levels?

### Measure Adoption

Per D.21-05-031 this resolution adopts and locks approved ex ante values contained in the measure packages for PY2023 and PY2024-2025. The list of measure packages adopted and locked for PY2023 is listed in Appendix A1 and the list of measure packages adopted and locked for PY2024-25 is listed in Appendix A2.<sup>28</sup> All measures that will be active in that program year will be adopted and locked, not just those with updates. New measures can be added off-cycle and will be tracked with start and end dates of those measures in the eTRM.

The dispositions and guidance documents used to inform the measure updates for PY2023 and PY2024-25 are provided for reference in Appendices A3 and A4 respectively. New guidance that has not been previously issued is provided in the sections below.

#### T. Guidance Based on Industry Standard Practice (ISP) Studies

This section summarizes CPUC guidance for measure packages related to recent industry standard practice studies. Five ISP studies were conducted by the IOUs as directed by Resolution E-4939. We find from the five completed ISP studies the following:

1. No updates are required for updating the DEER2024 baselines according to the results from the SDG&E *Industry Standard Practice Study of Unitary AC and HP Study*. The study concluded that high efficiency boilers are not yet industry standard practice. This ISP study shall be kept up-to-date with future minimum efficiency standards.

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<sup>28</sup> At the time of this draft, all measure packages anticipated to be included are listed but some are noted as “under review” or “submittal pending.” A “live” tracking spreadsheet can be accessed at <https://cedars.sound-data.com/deer-resources/deemed-measure-packages/resolutions/resource/2/history>. It provides updated measure package approval status and a short summary of the approved or anticipated measure package updates.

2. No update is required for DEER2024 based on the SCE *Market Impacts of Low-GWP Refrigerants for Refrigeration Equipment* as the study found that low global warming potential refrigerants were not ISP.
3. Updates are required based on the PG&E *Industrial Standard Practice Study of Commercial Domestic Hot Water Boilers for Commercial and Multifamily Sectors*. Measure Packages SWWH005-02 (Boiler, Commercial), SWWH007-03 (Storage Water Heater, Commercial), SWWH010-01 (Boiler, Commercial), and SWWH011-01 (Central Storage Water Heater, Multifamily) shall be updated to reflect all current state codes and the new federal minimum efficiency standard for hot water boilers,  $\geq 300$  kBtuh and  $\leq 2,500$  kBtuh set at 84% thermal efficiency which will become effective on January 10, 2023.
4. No update is required in DEER2024 resulting from the SCG study titled *Retrofit Modulating Gas Dryer Valve for Commercial Dryers*. The study determined that adding a modulating dryer valve to an existing dryer is not standard practice.
5. No update is required in DEER2024 resulting from the SCG study titled *Industry Standard Practice Study of Residential Low Flow Showerheads and Aerators* because low-flow showerheads and aerators comprise less than 50% of the market. However, the Water Sense specifications from this study shall be included as a measure offering requirement in low-flow showerhead and aerator measures to ensure customer satisfaction with the product.

U. Guidance from 2019 Custom Industrial, Agricultural, and Commercial (CIAC) Impact Evaluation Review

Effective Program Year: 2024. The 2019 CIAC study<sup>29</sup> found lower NTGRs than the defaults in the DEER database. Evaluated NTGRs were determined based on surveys with decision makers in the organizations that implemented custom projects. We direct the following:

1. The default NTG ratio for custom (ci) agricultural measures is decreased from 0.70 to 0.50.
2. The default NTG ratio for electric savings of commercial measures is decreased from 0.60 to 0.50.
3. The NTG ratio for custom, direct-install lighting measures is decreased from 0.60 to 0.45.

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<sup>29</sup> "Group D 2019 Custom Industrial, Agricultural, and Commercial (CIAC) Impact Evaluation," by SBW Consulting for CPUC, February 1, 2022. (<https://pda.energydataweb.com/#!/documents/2583/view>)

## V. Guidance from Review of 2022 EM&V Reports for PY2020 Deemed Measure Claims

Effective Program Year: 2024. Evaluation results with sufficient rigor and precision are used to update DEER and measure package assumptions. Resolution E-5152 instructed PAs to work with CPUC staff to determine EM&V results being released in the calendar year 2022 EM&V bus stop that affect DEER measures due to the compressed timeline during transition period and to ensure EM&V studies finalized in calendar year 2022 are considered for the DEER2024 adoption.

Final evaluation study results, focused primarily on PY2020 claims, informed updates to deemed measures that are hereby adopted as follows:

1. To ensure the gas savings expectations are met, we direct that residential ductless HVAC fuel substitution measure packages shall be revised so that only direct install and downstream delivery types are eligible and measure package eligibility requirements include decommissioning the existing gas system, per the findings and recommendations in the HVAC Fuel Substitution Impact Evaluation.<sup>30</sup>
2. We direct the PAs that claims shall be based on actual building type rather than using Com or Res for all downstream programs and — where possible — for midstream and upstream programs, particularly those that deliver Unitary Air-Cooled Air Conditioners or Heat Pumps, based primarily on the findings and recommendations in the Commercial HVAC Sector Impact Evaluation.<sup>31</sup>
3. We direct that the NTG ratio for the residential smart thermostat (rebate/downstream) is decreased from 0.60 to 0.50 based on the EM&V report for PY2020.<sup>32</sup> Evaluated NTG ratios for this measure over the past several years have fluctuated around 0.50 rather than showing a consistent trend.
4. We direct that the annual deemed electric and gas savings for residential smart controlling thermostats (SCT) is decreased to levels that are halfway between the previous deemed values and those that were determined using the PY2020 billing analysis results. This was done because the deemed values represent pre-COVID savings prior to thermostat optimization as a standard opt-in option whereas the evaluated values represent during-COVID savings with the addition

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<sup>30</sup> "Group A Impact Evaluation PY2020 HVAC Fuel Substitution," by DNV for CPUC, May 20, 2022.

([www.calmac.org/publications/CPUC Group A HVAC Fuel Substitution Impact Evaluation PY2020 Final.pdf](http://www.calmac.org/publications/CPUC%20Group%20A%20HVAC%20Fuel%20Substitution%20Impact%20Evaluation%20PY2020%20Final.pdf))

<sup>31</sup> "Impact Evaluation Report Commercial HVAC Sector-Program Year 2020," by DNV for CPUC, April 29, 2022. ([www.calmac.org/publications/Group A YR4 Com HVAC Impact Report Final CALMAC.pdf](http://www.calmac.org/publications/Group%20A%20YR4%20Com%20HVAC%20Impact%20Report%20Final%20CALMAC.pdf))

<sup>32</sup> "Impact Evaluation of Residential HVAC Measures Residential Sector – Program Year 2020," by DNV for CPUC, June 3, 2022. ([www.calmac.org/publications/Group A Residential PY2020 RES HVAC Final Report CALMAC.pdf](http://www.calmac.org/publications/Group%20A%20Residential%20PY2020%20RES%20HVAC%20Final%20Report%20CALMAC.pdf))

of thermostat optimization; the only way to account for the unknown effects of COVID combined with the expected savings increase from optimization is to combine these two conditions. This is because a full return to pre-COVID work patterns is not expected for the foreseeable future. Specific values by building type and climate zone are provided in Attachment A. If we had just used the energy savings based on the most recent EM&V report, the savings would have been lower.

5. We direct that the NTG ratio for residential fuel substitution heat pump measures is decreased from 1.00 to 0.55 for the midstream delivery type.<sup>33</sup>
6. We direct that the NTG ratio of 0.20 for commercial and multifamily space-heating boilers is expanded to apply to all delivery types (resulting in a decrease from 0.60 for upstream applications).
7. We direct that the NTG ratio for commercial water-heating boilers is decreased from 0.60 to 0.10 (excluding downstream delivery type).<sup>34</sup>
8. We direct that the NTG ratio for indoor LED tube lighting is increased from 0.65 to 0.70 for downstream and direct install delivery types.<sup>35</sup>
9. We direct that the NTG ratio for indoor LED fixtures (including high/low bay) is decreased from 0.65 to 0.60 for downstream and direct install delivery types.
10. We direct that the NTG ratio for variable frequency drives (VFD) on well pumps smaller than 300 hp is increased from 0.30 to 0.40.<sup>36</sup>
11. We direct that the NTG ratio for commercial fryers is decreased from 0.60 to 0.35 for the downstream delivery type.

## **COMMENTS**

Public Utilities Code section 311(g)(1) provides that this resolution must be served on all parties and subject to at least 30 days public review. Please note that comments are due 20 days from the mailing date of this resolution. Section 311(g)(2) provides that this 30-day review period and 20-day comment period may be reduced or waived upon the

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<sup>33</sup> "Group A Impact Evaluation PY2020 HVAC Fuel Substitution," by DNV for CPUC, May 20, 2022. ([www.calmac.org/publications/CPUC Group A HVAC Fuel Substitution Impact Evaluation PY2020 Final.pdf](http://www.calmac.org/publications/CPUC%20Group%20A%20HVAC%20Fuel%20Substitution%20Impact%20Evaluation%20PY2020%20Final.pdf))

<sup>34</sup> "Impact Evaluation Report Commercial HVAC Sector-Program Year 2020," by DNV for CPUC, April 29, 2022. ([www.calmac.org/publications/Group A YR4 ComHVAC Impact Report Final CALMAC.pdf](http://www.calmac.org/publications/Group%20A%20YR4%20ComHVAC%20Impact%20Report%20Final%20CALMAC.pdf))

<sup>35</sup> "Final Impact Evaluation Non-Residential Lighting Sector Program Year 2020," by Quantum Consulting for CPUC, April 28, 2022. ([www.calmac.org/publications/ AllSections Final w Apps.pdf](http://www.calmac.org/publications/AllSections%20Final%20w%20Apps.pdf))

<sup>36</sup> "Final Impact Evaluation Non-Residential Deemed Pump and Food Service Program Year 2020," by Quantum Consulting for CPUC, April 28, 2022. ([www.calmac.org/publications/ PumpFoodService ALLSections Final W APPS.pdf](http://www.calmac.org/publications/PumpFoodService%20ALLSections%20Final%20W%20APPS.pdf))



stipulation of all parties in the proceeding. Interested stakeholders do not need to have party status in order to submit comments on the resolution.

The 30-day review and 20-day comment period for the draft of this resolution was neither waived nor reduced. Accordingly, this draft resolution was mailed for comments, and will be placed on the Commission's agenda no earlier than 30 days from today.

## **FINDINGS**

1. We find it reasonable for the eTRM to continue to be administered by the PAs.
2. Resolution E-5082 authorized the IOUs to fund eTRM development and CalTF support activities in their EE program budgets or their EM&V budgets.
3. Resolution E-5082 authorized CPUC staff to make adjustments to the eTRM development timeline to address issues that arise during development and testing.
4. Resolution E-5082 OP 6 required that DEER databases and eTRM shall continue to be administered and maintained by the IOU funders without changes to contract management structure until completion Phase 1 and Phase 2 activities, and both Phase 1 and Phase 2 have been satisfactorily completed.
5. Decision D.15-10-028 retains the direction from D.12-05-015 that DEER values be updated to be consistent with existing and updated state and federal codes and standards.
6. Decision D.15-10-028 also states that CPUC staff may make changes at any time without a Resolution to fix errors or to change documentation.
7. We find it feasible to transition from the use of MASControl3<sup>®</sup> and eQUEST models that use the DOE2 simulation engine to the EnergyPlus simulation engine.
8. It is appropriate to update the DEER values as result of a) updates to underlying methodology, b) updates for corrections and clarifications, c) updates based on evaluation study results, d) new code updates, e) review of market and research studies, and f) addition of new measures.
9. Decision D.05-01-055 establishes the CPUC Energy Division authority to review and approve measures, including authority to designate a set of values as the deemed data source of record.

## **THEREFORE, IT IS ORDERED that:**

1. The IOUs will continue to fund and administer the eTRM from the IOU portion of the EM&V budgets and will address support activities for eTRM and CalTF in their 2024-2027 Business Plans.

2. The IOU funders will grant the CPUC an irrevocable, royalty-free license to use, copy and distribute the eTRM in perpetuity while they continue to contract for administration, maintenance, and enhancements of the eTRM.
3. The IOUs may alter the structure of eTRM contract management upon completion of Phase 2 activities in order to alternate the role of lead contract manager and solicit contractors for software development and coordination.
4. The DEER2024 and Revised DEER2023 and DEER2022 Updates, listed in Table 1, as described in Attachment A, and per supporting documentation available on the DEER Module at the CEDARS website, are approved with effective dates as listed. The Appendices and the Attachment to this resolution are considered part of this resolution.
5. Pacific Gas and Electric Company (PG&E), Southern California Electric Company (SCE), Southern California Gas Company (SoCalGas), and San Diego Gas & Electric (SDG&E), the San Francisco Bay Area Regional Energy Network (BayREN), Southern California Regional Energy Network (SoCalREN), Tri-County Regional Energy Network (3CREN), Local Government Sustainable Energy Coalition (LGSEC), Lancaster Choice Energy (LCE), and Marin Clean Energy (MCE) must use the updated assumptions, methods and values for Program Years 2022 and 2023 planning and savings claims, and Program Years 2024-25 planning, implementation and reporting.
6. Pacific Gas and Electric Company (PG&E), Southern California Electric Company (SCE), Southern California Gas Company (SoCalGas), and San Diego Gas & Electric (SDG&E), the San Francisco Bay Area Regional Energy Network (BayREN), Southern California Regional Energy Network (SoCalREN), Tri-County Regional Energy Network (3CREN), Local Government Sustainable Energy Coalition (LGSEC), Lancaster Choice Energy (LCE), and Marin Clean Energy (MCE) must follow the updated process adopted in this resolution for deemed ex ante activities as directed in this resolution.
7. Pacific Gas and Electric Company (PG&E), Southern California Electric Company (SCE), Southern California Gas Company (SoCalGas), and San Diego Gas & Electric (SDG&E), the San Francisco Bay Area Regional Energy Network (BayREN), Southern California Regional Energy Network (SoCalREN), Tri-County Regional Energy Network (3CREN), Local Government Sustainable Energy Coalition (LGSEC), Lancaster Choice Energy (LCE), and Marin Clean Energy (MCE) must comply with the updated schedule for activities adopted in this resolution unless expressly authorized by CPUC staff.

This Resolution is effective today.

I certify that the foregoing resolution was duly introduced, passed and adopted at a conference of the Public Utilities Commission of the State of California held on October 20, 2022; the following Commissioners voting favorably thereon:

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Rachel Peterson  
Executive Director

## A1. PY2023 Measures

The list provided for PY2023 in Table A1.1<sup>37</sup> is preliminary and will be updated for the final resolution.

### A1.1. PY2023 Measure Package Updates

Measure Package ID	Measure Name	Program Year	Lead IOU	Status
SWAP001-04	Refrigerator or Freezer, Residential	2023	SDGE	[Under review]
SWAP003-04	Clothes Dryer, Residential	2023	SCG	Approved
SWAP004-03	Clothes Washer, Residential & Multifamily	2023	SCG	[Under review]
SWAP005-02	Ozone Laundry, Commercial	2023	SCG	Approved
SWAP006-04	Dishwasher, Residential	2023	SCG	Approved
SWAP007-02	Room Air Conditioner, Residential	2023	SDGE	Approved
SWAP008-02	Room Air Cleaner, Residential	2023	SDGE	Approved
SWAP011-03	Vending and Beverage Merchandise Controller	2023	SCE	Approved
SWAP012-01	Gas Dryer Modulating Valve, Commercial and Multifamily	2023	SCG	Approved
SWAP013-02	Residential Cooking Appliances – Fuel Substitution	2023	SCE	[Under review]
SWAP014-01	Heat Pump Clothes Dryer, Residential, Fuel Substitution	2023	SCE	Approved
SWAP015-02	Induction Cooking Top with or without Electric Range, Residential	2023	SDGE	Approved
SWAP017-02	Oven, Gas, Residential	2023	SCG	Approved
SWBE001-02	Greenhouse Heat Curtain	2023	SCG	Approved
SWBE002-02	Greenhouse Infrared Film	2023	SCG	Approved
SWBE006-01	Residential Ceiling Insulation	2023	SCG	Approved
SWBE007-01	Residential Blow-In Wall Insulation	2023	SCG	Approved

<sup>37</sup> At the time of this draft, all measure packages anticipated to be included are listed but some are noted as “under review” or “submittal pending.” A “live” tracking spreadsheet can be accessed at <https://cedars.sound-data.com/deer-resources/deemed-measure-packages/resolutions/resource/2/history>. It provides updated measure package approval status and a short summary of the approved or anticipated measure package updates.

Measure Package ID	Measure Name	Program Year	Lead IOU	Status
SWCA001-03	Air Compressor VFD Retrofit	2023	SCE	Approved
SWCR001-03	Anti-Sweat Heat Controls	2023	SCE	Approved
SWCR002-03	Low-Temperature Display Case Doors with No Anti-Sweat Heaters	2023	SCE	Approved
SWCR003-02	High Efficiency Motor Retrofit for Refrigerated Display Case	2023	SCE	Approved
SWCR004-02	EC Motor Retrofit for A Walk-In Cooler or Freezer	2023	SCE	Approved
SWCR005-03	Auto Closer for Refrigerated Storage Door	2023	SCE	Approved
SWCR007-03	Floating Head Pressure Controls, Multiplex	2023	PG&E	Approved
SWCR008-03	Floating Suction Controls, Multiplex	2023	SCE	Approved
SWCR010-03	Bare Suction Pipe Insulation	2023	SCE	Approved
SWCR012-02	Compressor Retrofit, Multiplex	2023	PG&E	Approved
SWCR014-03	Medium or Low-Temperature Display Case	2023	PG&E	Approved
SWCR015-02	Medium-Temperature Case Doors	2023	PG&E	Approved
SWCR017-03	Ultra-Low Temperature Freezer	2023	PG&E	Approved
SWCR018-03	Reach-In Refrigerator or Freezer, Commercial	2023	PG&E	Approved
SWCR019-02	Low-Temperature Coffin to Reach-In Display Case Conversion	2023	PG&E	Approved
SWCR020-02	Medium-Temperature Open Display Case Retrofit	2023	PG&E	Approved
SWCR021-02	Medium or Low-Temperature Display Case with Doors	2023	PG&E	Approved
SWCR022-03	Efficient Adiabatic Condenser	2023	SCE	Approved
SWFS001-02	Commercial Convection Oven – Electric & Gas	2023	SCG	Approved
SWFS002-03	Door Type Dishwasher, Commercial	2023	SCG	Approved
SWFS003-02	Combination Oven, Commercial	2023	SCG	[Under review]
SWFS004-01	Commercial Griddle – Electric & Gas	2023	SCG	Approved

Measure Package ID	Measure Name	Program Year	Lead IOU	Status
SWFS005-03	Steamer, Commercial	2023	SCG	[Under review]
SWFS006-02	Commercial Ice Machine	2023	PG&E	Approved
SWFS007-03	Insulated Hot Food Holding Cabinet	2023	SCG	Approved
SWFS008-01	Conveyor Oven, Gas, Commercial	2023	SCG	Approved
SWFS009-02	Commercial Deck Oven, Electric	2023	SCG	Approved
SWFS010-02	Commercial Hand Wrap Machine	2023	SCG	Approved
SWFS011-04	Fryer, Commercial	2023	SCG	Approved
SWFS012-01	Exhaust Hood Demand Controlled Ventilation, Commercial	2023	SCG	Approved
SWFS013-02	Low-Flow Pre-Rinse Spray Valve	2023	SCG	Approved
SWFS014-02	Rack Oven	2023	SCG	Approved
SWFS016-02	Refrigerated Chef Base	2023	SCE	[Under review]
SWFS017-02	Automated Conveyor Broiler, Commercial	2023	SCG	Approved
SWFS018-04	Undercounter Dishwasher, Commercial	2023	SCG	Approved
SWFS019-02	Underfired Broiler, Commercial	2023	SCG	Approved
SWFS021-03	Commercial Fryer, Fuel Substitution	2023	SCE	Approved
SWFS022-02	Commercial Convection Oven, Fuel Substitution	2023	SCE	Approved
SWFS023-02	Conveyorized Toaster, Commercial	2023	SCE	Approved
SWHC001-02	Wall Furnace, Residential	2023	SCG	Approved
SWHC002-02	Intermittent Pilot Light, Residential	2023	SCG	Approved
SWHC004-04	Space Heating Boiler, Multifamily	2023	SCG	[Under review]
SWHC005-03	Water-Cooled Chiller	2023	SDGE	[Under review]
SWHC006-02	Demand Control Ventilation for Single Zone HVAC	2023	PG&E	Approved
SWHC008-01	VSD For Central Plant System	2023	SCE	Approved
SWHC009-03	Supply Fan Controls, Commercial	2023	SDGE	[Under review]
SWHC011-02	Furnace, Commercial	2023	SCG	[Under review]
SWHC012-02	Classroom HVAC Occupancy Sensor	2023	SCE	[Under review]

Measure Package ID	Measure Name	Program Year	Lead IOU	Status
SWHC013-03	Unitary Air-Cooled AC and HP, over 65 kBtu/hr, Commercial	2023	SDGE	[Submittal pending]
SWHC014-03	Unitary Air-Cooled AC and HP, below 65 kBtu/hr, Commercial	2023	SDGE	[Under review]
SWHC018-03	VSD for HVAC Fan Controls, Commercial	2023	PG&E	Approved
SWHC020-03	Air Cooled Chiller	2023	SDGE	[Submittal pending]
SWHC023-03	Enhanced Ventilation for Packaged HVAC	2023	PG&E	Approved
SWHC024-03	Cogged V-Belt for HVAC Fan, Commercial	2023	SCE	[Under review]
SWHC027-02	Packaged Terminal Air Conditioner or Heat Pump, Under 24kBtuh	2023	SCE	Approved
SWHC029-02	Fan controller for air conditioner, residential	2023	SCE	Approved
SWHC030-03	Whole House Fan	2023	SCE	[Submittal pending]
SWHC031-02	High-Efficiency Furnace, Residential	2023	SCG	Approved
SWHC038-02	Brushless Fan Motor Replacement, Residential	2023	SCE	Approved
SWHC039-05	Smart Thermostat, Residential	2023	SCE	[Under review]
SWHC041-03	Software-Controlled Switch Reluctance Motor	2023	SCE	Approved
SWHC042-03	Evaporative Pre-Cooler System and Controls for Packaged HVAC Unit	2023	SCE	[Under review]
SWHC043-03	Multiple Capacity Unitary Air-Cooled Commercial Air Conditioners Between 65 and 240 kBtu/hr	2023	SDGE	[Under review]
SWHC044-02	Ductless HVAC, Residential, Fuel Substitution	2023	SCE	Approved
SWHC045-01	Heat Pump HVAC, Residential - Fuel Substitution	2023	SCE	Approved
SWHC046-02	Heat Pump, Unitary Air-Cooled HVAC, Commercial - Fuel Substitution	2023	SCE	[Under review]
SWHC047-02	Gas Fireplace, Residential	2023	SCG	Approved

Measure Package ID	Measure Name	Program Year	Lead IOU	Status
SWHC048-03	Packaged AC Heat Recovery	2023	SCG	Approved
SWHC049-02	HVAC, SEER-Rated AC and HP Equipment, Residential	2023	SDGE	Approved
SWHC050-02	Ductless Heat Pump, HVAC, Residential	2023	SDGE	Approved
SWHC052-02	Air-Cooled Chiller, Path B	2023	SDGE	[Under review]
SWLG009-04	LED, Tube, Type A	2023	SCE	[Under review]
SWLG011-04	LED, High or Low Bay	2023	SCE	[Under review]
SWLG018-03	LED, Tube Type B and Type C	2023	SCE	[Under review]
SWMI001-02	Water Energy Nexus	2023	SDGE	Approved
SWPR001-01	Ventilation Fan, Agriculture	2023	PG&E	Approved
SWPR002-02	VFD for Glycol Pump Motor	2023	PG&E	Approved
SWPR003-01	Steam Trap, Commercial	2023	SCG	Approved
SWPR004-03	Circulating Block Heater	2023	SCE	[Under review]
SWPR005-02	Dust Collection Fan VSD	2023	PG&E	Approved
SWPR006-02	VSD For Ventilation Fan	2023	PG&E	[Under review]
SWPR007-01	Steam Boiler Economizer, Industrial	2023	SCG	Approved
SWRE001-02	Pool Cover, Commercial	2023	SCG	Approved
SWRE003-02	Pool Heater, Commercial	2023	SCG	[Under review]
SWRE004-02	Pool or Spa Heater, Residential	2023	SCG	Approved
SWRE005-02	Heat Pump Pool Heater, Residential - Fuel Substitution	2023	SCE	[Under review]
SWSV001-04	Duct Seal, Residential	2023	PG&E	Approved
SWSV003-01	Evaporator Coil Cleaning, Commercial	2023	SDGE	Approved
SWSV004-01	Condenser Coil Cleaning, Commercial	2023	SDGE	Approved
SWSV005-02	Economizer Repair, Commercial	2023	SDGE	Approved
SWSV007-01	Condenser Coil Cleaning, Residential	2023	SCE	Approved
SWSV008-01	Evaporator Coil Cleaning, Residential	2023	SCE	Approved
SWSV009-01	Air Flow Adjustment, Residential	2023	SCE	Approved
SWSV010-02	Economizer Controls, Commercial	2023	SDGE	Approved



Measure Package ID	Measure Name	Program Year	Lead IOU	Status
SWSV013-02	Duct Optimization, DMO	2023	SDGE	Approved
SWWB002-01	Universal Audit Tool	2023	PG&E	Approved
SWWB004-02	Home Energy Reports	2023	PG&E	Approved
SWWB006-03	Insulation/Sealing for Crawl Space, Residential	2023	SCE	Approved
SWWH001-03	Faucet Aerator, Residential	2023	SCG	[Under review]
SWWH002-03	Low-Flow Showerhead, Residential	2023	SCG	Approved
SWWH003-02	TSV with Low Flow Showerhead	2023	SCG	Approved
SWWH004-03	Laminar Flow Restrictor	2023	SCG	[Under review]
SWWH005-05	Boiler, Commercial	2023	SCG	[Under review]
SWWH006-07	Tankless Water Heater, Commercial	2023	SCG	[Under review]
SWWH007-05	Storage Water Heater, Commercial	2023	SCG	[Under review]
SWWH008-01	Boiler, Process	2023	PG&E	Approved
SWWH010-02	Boiler, Multifamily	2023	SCG	[Under review]
SWWH011-01	Central Storage Water Heater, Multifamily	2023	PG&E	Approved
SWWH012-03	Storage Water Heater, Residential	2023	SCG	Approved
SWWH013-03	Tankless Water Heater, Residential	2023	SCG	Approved
SWWH014-04	Heat Pump Water Heater, Residential	2023	SCE	[Under review]
SWWH015-03	Demand Control for Centralized Water Heater Recirculation Pump, Multifamily & Commercial	2023	SCG	Approved
SWWH016-03	Domestic Hot Water Loop Temperature Controller, Multifamily & Commercial	2023	SCG	Approved
SWWH017-03	Hot Water Pipe Insulation, Nonresidential and Multifamily	2023	SCG	Approved
SWWH018-03	Hot Water Tank Insulation, Nonresidential and Multifamily	2023	SCG	Approved
SWWH019-04	Faucet Aerator, Commercial	2023	SCG	Approved
SWWH020-04	Low-Flow Showerhead, Commercial	2023	SCG	[Under review]
SWWH021-01	Recirculation Pump Timer, Commercial	2023	SCG	Approved

Measure Package ID	Measure Name	Program Year	Lead IOU	Status
SWWH022-01	Smart Pump, Residential	2023	PG&E	Approved
SWWH023-02	Tub Spout TSV	2023	SCG	Approved
SWWH024-01	Central Boiler Dual Setpoint Controller, Multifamily	2023	SCG	Approved
SWWH025-05	Residential Heat Pump Water Heater, Fuel Substitution	2023	SCE	[Under review]
SWWH026-02	Water Heater Pipe Wrap, Residential	2023	SCG	Approved
SWWH027-03	Heat Pump Water Heater, Commercial, Fuel Substitution	2023	SCE	[Under review]
SWWH028-02	Multi-Family and Commercial Large Heat Pump Water Heater– Fuel Substitution	2023	SCE	[Under review]
SWWH031-02	Heat Pump Water Heater, Commercial	2023	SCE	[Under review]
SWWH032-01	Solar Thermal Water Heating System, Residential	2023	SCG	Approved
SWWH033-02	Gas Heat Pump Water Heater, Multifamily	2023	SCG	[Under review]
SWWH034-01	Solar Thermal Water Heating System, Multifamily	2023	SCG	Approved
SWWP002-02	VFD on Ag Pump	2023	PG&E	Approved
SWWP004-02	Water Pump Upgrade	2023	PG&E	Approved
SWWP005-02	Enhanced VFD On Irrigation Pump	2023	PG&E	Approved

## A2. PY2024-25 Measures

The list provided in Table A2.1 is preliminary and will be updated for the final resolution.<sup>38</sup>

**Table A2.1. DEER2024-25 Measure Packages to be Updated**

Measure Package ID	Measure Name	Program Year	Lead IOU	Status
SWAP001-05	Refrigerator or Freezer, Residential	2024	SDGE	[Submittal pending]
SWAP003-04	Clothes Dryer, Residential	2024	SCG	Approved
SWAP004-03	Clothes Washer, Residential & Multifamily	2024	PG&E	[Under review]
SWAP005-02	Ozone Laundry, Commercial	2024	SCG	Approved
SWAP006-04	Dishwasher, Residential	2024	SCG	Approved
SWAP007-02	Room Air Conditioner, Residential	2024	SDGE	Approved
SWAP008-02	Room Air Cleaner, Residential	2024	SDGE	Approved
SWAP011-03	Vending and Beverage Merchandise Controller	2024	SCE	Approved
SWAP012-01	Gas Dryer Modulating Valve, Commercial and Multifamily	2024	SCG	Approved
SWAP013-02	Residential Cooking Appliances – Fuel Substitution	2024	SCE	[Under review]
SWAP014-02	Heat Pump Clothes Dryer, Residential, Fuel Substitution	2024	SCE	[Submittal pending]
SWAP015-02	Induction Cooking Top with or without Electric Range, Residential	2024	SDGE	Approved
SWAP017-02	Oven, Gas, Residential	2024	SCG	Approved
SWBE001-02	Greenhouse Heat Curtain	2024	SCG	Approved
SWBE002-02	Greenhouse Infrared Film	2024	SCG	Approved

<sup>38</sup> At the time of this draft, all measure packages anticipated to be included are listed but some are noted as “under review” or “submittal pending.” A “live” tracking spreadsheet can be accessed at <https://cedars.sound-data.com/deer-resources/deemed-measure-packages/resolutions/resource/2/history>. It provides updated measure package approval status and a short summary of the approved or anticipated measure package updates.

Measure Package ID	Measure Name	Program Year	Lead IOU	Status
SWBE006-02	Residential Ceiling Insulation	2024	SCG	[Submittal pending]
SWBE007-02	Residential Blow-In Wall Insulation	2024	SCG	[Submittal pending]
SWCA001-03	Air Compressor VFD Retrofit	2024	SCE	Approved
SWCR001-03	Anti-Sweat Heat Controls	2024	SCE	Approved
SWCR002-03	Low-Temperature Display Case Doors with No Anti-Sweat Heaters	2024	SCE	Approved
SWCR003-02	High Efficiency Motor Retrofit for Refrigerated Display Case	2024	SCE	Approved
SWCR004-02	EC Motor Retrofit for a Walk-In Cooler Or Freezer	2024	SCE	Approved
SWCR005-03	Auto Closer for Refrigerated Storage Door	2024	SCE	Approved
SWCR007-03	Floating Head Pressure Controls, Multiplex	2024	PG&E	Approved
SWCR008-03	Floating Suction Controls, Multiplex	2024	SCE	Approved
SWCR010-03	Bare Suction Pipe Insulation	2024	SCE	Approved
SWCR012-02	Compressor Retrofit, Multiplex	2024	PG&E	Approved
SWCR014-03	Medium or Low-Temperature Display Case	2024	PG&E	Approved
SWCR015-02	Medium-Temperature Case Doors	2024	PG&E	Approved
SWCR017-03	Ultra-Low Temperature Freezer	2024	PG&E	Approved
SWCR018-03	Reach-In Refrigerator or Freezer, Commercial	2024	PG&E	Approved
SWCR019-02	Low-Temperature Coffin to Reach-In Display Case Conversion	2024	PG&E	Approved
SWCR020-02	Medium-Temperature Open Display Case Retrofit	2024	PG&E	Approved
SWCR021-02	Medium or Low-Temperature Display Case with Doors	2024	PG&E	Approved
SWCR022-03	Efficient Adiabatic Condenser	2024	SCE	Approved

Measure Package ID	Measure Name	Program Year	Lead IOU	Status
SWFS001-02	Commercial Convection Oven – Electric & Gas	2024	SCG	Approved
SWFS002-03	Door Type Dishwasher, Commercial	2024	SCG	Approved
SWFS003-02	Combination Oven, Commercial	2024	SCG	[Under review]
SWFS004-01	Commercial Griddle – Electric & Gas	2024	SCG	Approved
SWFS005-03	Steamer, Commercial	2024	SCG	[Under review]
SWFS006-02	Ice Machine, Commercial	2024	PG&E	Approved
SWFS007-03	Insulated Hot Food Holding Cabinet	2024	SCE	Approved
SWFS008-01	Conveyor Oven, Gas, Commercial	2024	SCG	Approved
SWFS009-02	Commercial Deck Oven, Electric	2024	SCE	Approved
SWFS010-02	Commercial Hand Wrap Machine	2024	SCE	Approved
SWFS011-05	Fryer, Commercial	2024	SCG	Approved
SWFS012-01	Exhaust Hood Demand Controlled Ventilation, Commercial	2024	SCE	Approved
SWFS013-02	Low-Flow Pre-Rinse Spray Valve	2024	SCG	Approved
SWFS014-02	Rack Oven	2024	SCG	Approved
SWFS016-03	Refrigerated Chef Base	2024	SCE	[Under review]
SWFS017-02	Automated Conveyor Broiler, Commercial	2024	SCG	Approved
SWFS018-04	Undercounter Dishwasher, Commercial	2024	SCG	Approved
SWFS019-02	Underfired Broiler, Commercial	2024	SCG	Approved
SWFS021-03	Commercial Fryer, Fuel Substitution	2024	SCE	Approved
SWFS022-02	Commercial Convection Oven, Fuel Substitution	2024	SCE	Approved
SWFS023-02	Conveyorized Toaster, Commercial	2024	SCE	Approved
SWHC001-03	Wall Furnace, Residential	2024	SCG	[Under review]
SWHC002-03	Intermittent Pilot Light, Residential	2024	SCG	Approved
SWHC004-04	Space Heating Boiler, Multifamily	2024	SCG	[Under review]
SWHC005-03	Water-Cooled Chiller	2024	SDGE	[Submittal pending]

Measure Package ID	Measure Name	Program Year	Lead IOU	Status
SWHC006-02	Demand Control Ventilation for Single Zone HVAC	2024	PG&E	Approved
SWHC008-01	VSD For Central Plant System	2024	SCE	Approved
SWHC009-03	Supply Fan Controls, Commercial	2024	SDGE	[Under review]
SWHC011-02	Furnace, Commercial	2024	SCG	[Under review]
SWHC012-02	Classroom HVAC Occupancy Sensor	2024	SCE	[Under review]
SWHC013-03	Unitary Air-Cooled AC and HP, over 65 kBtu/hr, Commercial	2024	SDGE	[Submittal pending]
SWHC014-03	Unitary Air-Cooled AC and HP, below 65 kBtu/hr, Commercial	2024	SDGE	[Under review]
SWHC018-03	VSD for HVAC Fan Controls, Commercial	2024	PG&E	Approved
SWHC020-03	Air Cooled Chiller	2024	SDGE	[Submittal pending]
SWHC023-03	Enhanced Ventilation for Packaged HVAC	2024	PG&E	Approved
SWHC024-03	Cogged V-Belt for HVAC Fan, Commercial	2024	SCE	[Under review]
SWHC027-03	Package Terminal Air Conditioner or Heat Pump, Under 24 kBtu/hr	2024	SDGE	[Submittal pending]
SWHC029-03	Fan Controller for Air Conditioner, Residential	2024	SCE	[Submittal pending]
SWHC030-03	Whole House Fan	2024	SCE	[Submittal pending]
SWHC031-03	High-Efficiency Furnace, Residential	2024	SCG	[Submittal pending]
SWHC038-02	Brushless Fan Motor Replacement, Residential	2024	SCE	[Submittal pending]
SWHC039-06	Smart Thermostat, Residential	2024	SCE	[Submittal pending]
SWHC041-03	Software-Controlled Switch Reluctance Motor	2024	SCE	Approved
SWHC042-03	Evaporative Pre-Cooler System and Controls For Packaged HVAC Unit	2024	SCE	[Under review]

Measure Package ID	Measure Name	Program Year	Lead IOU	Status
SWHC043-03	Multiple Capacity Unitary Air-Cooled Commercial Air Conditioners Between 65 and 240 kBtu/hr	2024	SDGE	[Under review]
SWHC044-03	Ductless HVAC, Residential, Fuel Substitution	2024	SCE	[Submittal pending]
SWHC045-02	Heat Pump HVAC, Residential - Fuel Substitution	2024	SCE	[Submittal pending]
SWHC046-02	Heat Pump, Unitary Air-Cooled HVAC, Commercial - Fuel Substitution	2024	SCE	[Under review]
SWHC047-03	Gas Fireplace, Residential	2024	SCG	[Under review]
SWHC048-03	Packaged AC Heat Recovery	2024	SCG	Approved
SWHC049-03	SEER Rated AC and HP HVAC Equipment, Residential	2024	SDGE	[Submittal pending]
SWHC050-03	Ductless Heat Pump, Residential	2024	SDGE	[Submittal pending]
SWHC052-02	Air-Cooled Chiller, Path B	2024	SDGE	[Under review]
SWMI001-02	Water Energy Nexus	2024	SDGE	Approved
SWPR001-01	Ventilation Fan, Agriculture	2024	PG&E	Approved
SWPR002-02	VFD for Glycol Pump Motor	2024	PG&E	Approved
SWPR003-01	Steam Trap, Commercial	2024	SCG	Approved
SWPR004-03	Circulating Block Heater	2024	SCE	[Under review]
SWPR005-02	VFD for Dust Collection Fan	2024	PG&E	Approved
SWPR006-02	VSD For Ventilation Fan	2024	PG&E	[Under review]
SWPR007-01	Steam Boiler Economizer, Industrial	2024	SCG	Approved
SWRE001-02	Pool Cover, Commercial	2024	SCG	Approved
SWRE003-02	Pool Heater, Commercial	2024	SCG	[Under review]
SWRE004-03	Pool or Spa Heater, Residential	2024	SCG	Approved
SWRE005-02	Heat Pump Pool Heater, Residential - Fuel Substitution	2024	SCE	[Under review]
SWSV001-05	Duct Seal, Residential	2024	SDGE	[Submittal pending]

Measure Package ID	Measure Name	Program Year	Lead IOU	Status
SWSV003-01	Evaporator Coil Cleaning, Commercial	2024	SDGE	Approved
SWSV004-01	Condenser Coil Cleaning, Commercial	2024	SDGE	Approved
SWSV005-02	Economizer Repair, Commercial	2024	SDGE	Approved
SWSV007-01	Condenser Coil Cleaning, Residential	2024	SCE	Approved
SWSV008-01	Evaporator Coil Cleaning, Residential	2024	SCE	Approved
SWSV009-01	Air Flow Adjustment, Residential	2024	SCE	Approved
SWSV010-02	Economizer Controls, Commercial	2024	SDGE	Approved
SWSV013-03	Duct Optimization	2024	SDGE	[Submittal pending]
SWWB002-01	Universal Audit Tool	2024	PG&E	Approved
SWWB004-02	Home Energy Reports	2024	PG&E	Approved
SWWB006-03	Insulation/Sealing for Crawl Space, Residential	2024	SCE	Approved
SWWH001-03	Faucet Aerator, Residential	2024	SCG	[Under review]
SWWH002-03	Low-Flow Showerhead, Residential	2024	SCG	Approved
SWWH003-02	TSV with Low Flow Showerhead	2024	SCG	Approved
SWWH004-03	Laminar Flow Restrictor	2024	SCG	[Under review]
SWWH005-05	Boiler, Commercial	2024	SCG	[Under review]
SWWH006-07	Tankless Water Heater, Commercial	2024	SCG	[Under review]
SWWH007-05	Storage Water Heater, Commercial	2024	SCG	[Under review]
SWWH008-01	Boiler, Process	2024	PG&E	Approved
SWWH010-02	Boiler, Multifamily	2024	SCG	[Under review]
SWWH011-02	Central Storage Water Heater, Multifamily	2024	PG&E	[Submittal pending]
SWWH012-03	Storage Water Heater, Residential	2024	SCG	Approved
SWWH013-03	Tankless Water Heater, Residential	2024	SCG	Approved
SWWH014-04	Heat Pump Water Heater, Residential	2024	SCE	[Under review]
SWWH015-03	Demand Control for Centralized Water Heater Recirculation Pump, Multifamily & Commercial	2024	SCG	Approved



Measure Package ID	Measure Name	Program Year	Lead IOU	Status
SWWH016-03	Domestic Hot Water Loop Temperature Controller, Multifamily & Commercial	2024	SCG	Approved
SWWH017-03	Hot Water Pipe Insulation, Nonresidential and Multifamily	2024	SCG	Approved
SWWH018-03	Hot Water Tank Insulation, Nonresidential and Multifamily	2024	SCG	Approved
SWWH019-04	Faucet Aerator, Commercial	2024	SCG	Approved
SWWH020-04	Low-Flow Showerhead, Commercial	2024	SCG	[Under review]
SWWH021-01	Recirculation Pump Timer, Commercial	2024	SCG	Approved
SWWH022-01	Smart Pump, Residential	2024	PG&E	Approved
SWWH023-02	Tub Spout TSV	2024	SCG	Approved
SWWH024-02	Central Boiler Dual Setpoint Controller, Multifamily	2024	SCG	Approved
SWWH025-05	Residential Heat Pump Water Heater, Fuel Substitution	2024	SCE	[Under review]
SWWH026-02	Water Heater Pipe Wrap, Residential	2024	SCG	Approved
SWWH027-03	Heat Pump Water Heater, Commercial, Fuel Substitution	2024	SCE	[Under review]
SWWH028-02	Multi-Family and Commercial Large Heat Pump Water Heater– Fuel Substitution	2024	SCE	[Under review]
SWWH031-02	Heat Pump Water Heater, Commercial	2024	SCE	[Under review]
SWWH032-01	Solar Thermal Water Heating System, Residential	2024	SCG	Approved
SWWH033-02	Gas Heat Pump Water Heater, Multifamily	2024	SCG	[Under review]
SWWH034-01	Solar Thermal Water Heating System, Multifamily	2024	SCG	Approved
SWWP002-03	VFD on Well Pump, <= 300 hp	2024	PG&E	[Under review]
SWWP004-02	Water Pump Upgrade	2024	PG&E	Approved
SWWP005-03	Enhanced VFD on Irrigation Pump	2024	PG&E	[Under review]

### A3. Dispositions

The list of 2021 dispositions that will impact PY 2023 and PY 2024 measure packages is listed in Table A3.1. These documents can be downloaded from the DEER Module on CEDARS.<sup>39</sup>

**Table A3.1. Measure Package Dispositions Directing Updates for PY2023 and PY2024-2025**

Measure ID	Title	Date	Summary of Direction
SWHC039-04	Smart Thermostat, Residential	2021-12-20	Disposition approves the statewide measure package Smart Thermostat, Residential: SWHC039-04 to effective on January 1, 2022 and expire on December 31, 2022. The program administrators (PAs) are directed to revise the measure package for 2023 based on ongoing evaluation work in 2021 and early 2022. All additional analyses will be completed by Spring 2021 in time to facilitate a measure package update by June 1, 2022 to be effective January 1, 2023.
SWWP002-02	VFD on Well Pump, ≤300 hp	2021-09-01	Disposition approves the statewide measure package VFD on Well Pump, ≤ 300 hp: SWWP002-02 to be effective on January 1, 2022 and expire on December 31, 2023. The program administrators are directed to revise the measure package for PY 2024-2025 based on ISP research, possible combination of this measure with SWWP005-02 (Enhanced VFD on Irrigation Pump) based on the most recent data for operating profiles.

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<sup>39</sup> <https://cedars.sound-data.com/deer-resources/deemed-measure-packages/dispositions/>

Measure ID	Title	Date	Summary of Direction
SWWP005-02	Enhanced VFD on Irrigation Pump	2021-09-01	Disposition approves the statewide measure package Enhanced VFD on Irrigation Pump: SWWP005-02 to be effective on January 1, 2022 and expire on December 31, 2023. The program administrators are directed to revise the measure package for PY 2024-2025 based on ISP research, possible combination of this measure with SWWP002-02 (VFD on Well Pump, <=300 hp) based on the most recent data for operating profiles.
SWRE005-01	Heat Pump Pool Heater, Fuel Substitution	2021-07-30	Disposition approves the statewide measure package Heat Pump Pool Heater, Fuel Substitution: SWRE005-01 to be effective upon approval. The program administrators are directed to submit the incremental measure cost (IMC) addendum when the cost of the rebate exceeds the IMC.
SWWH027-02	Heat Pump Water Heater, Commercial, Fuel Substitution	2021-06-11	Disposition approves the statewide measure package Heat Pump Water Heater, Commercial, Fuel Substitution: SWWH027-02 to be effective on January 1, 2022. The program administrators are directed to submit the incremental measure cost (IMC) addendum when the cost of the rebate exceeds the IMC.
SWWH025-04	Heat Pump Water Heater, Residential, Fuel Substitution	2021-06-11	Disposition approves the statewide measure package Heat Pump Water Heater, Residential, Fuel Substitution: SWWH025-04 to be effective on January 1, 2022. The program administrators are directed to submit the incremental measure cost (IMC) addendum when the cost of the rebate exceeds the IMC.

Measure ID	Title	Date	Summary of Direction
SWHC044-02	Ductless HVAC, Residential, Fuel Substitution	2021-04-21	Disposition approves the statewide measure package Ductless HVAC, Residential, Fuel Substitution: SWHC044-02 to be effective on July 21, 2021. The program administrators are directed to submit the incremental measure cost (IMC) addendum when the cost of the rebate exceeds the IMC.
SWWH028-01	Heat Pump Water Heater, Multifamily and Commercial, Fuel Substitution	2022-01-25	Disposition approves the statewide measure package Heat Pump Water Heater, Multifamily and Commercial, Fuel Substitution: SWWH028-01 to be effective upon approval. The program administrators are directed to submit the incremental measure cost (IMC) addendum when the cost of the rebate exceeds the IMC.

## A4. Measure Package Guidance

Table A4.1 lists the guidance released since the last DEER Resolution that informs PY2023 and PY2024 Measure Updates. These documents can be downloaded from CEDARS at <https://cedars.sound-data.com/deer-resources/deemed-measure-packages/guidance/>.

**Table A4.1. Measure Package Guidance for PY2023 and PY2024-2025**

Date	Title (linked to full document)	Summary
2022-02-22	<a href="#">Short- and Long-term Solutions for Integrating Embedded Energy Savings into CEDARS</a>	Guidance outlining short- and long-term solutions for integrating water-energy embedded energy savings for claims.
2022-02-22	<a href="#">Measure Package Submission Cover Sheet Template Version 6</a>	This document is an updated cover sheet template for the IOUs to use when submitting measure packages through the eTRM.
2022-02-03	<a href="#">Guidance for NTG ratios for HTR with DI</a>	This guidance document summarizes the CPUC decision for applying the hard-to-reach (HTR) NTG ratio of 0.85 to HTR customers who receive equipment through direct install delivery channels.
2021-12-16	<a href="#">Energy Plus Files Memo</a>	This memo describes the files and supporting documents that should be submitted for residential non-DEER measures that were previously modeled using MASControl3 and eQUEST/DOE2 building simulations.
2021-12-03	<a href="#">Guidance for Refrigerant Avoided Cost Addendum (RACC) to Measure Packages</a>	This guidance provides the PAs with the approved RACC cover sheet and calculator to be submitted as an addendum to active measure packages.
2021-09-30	<a href="#">CPUC Guidance on the use of Negative Incremental Measure Cost (IMC) in the Cost Effectiveness Tool</a>	This guidance sets the precedent for fuel substitution measures to use zero for negative IMC value in the CET and use the standard addendum template for rebates greater than IMC values.

Date	Title (linked to full document)	Summary
2022-06-02	<a href="#">Addendum to Measure Package Documenting Incentive Greater than Incremental Measure Cost</a>	This guidance sets forth the process and documentation required for PAs to submit an addendum to measure packages informing the CPUC as to the need to provide an incentive which is greater than the incremental measure cost.
2022-06-09	<a href="#">Measure Package Adoption by PAs</a>	This guidance sets forth the process for PAs and third-party implementers to upload and adopt PA implementation codes in eTRM. A measure log entry will be created and set to 'PA Implementation Codes' with an attachment summarizing the specific permutations each PA will offer.
2022-08-16	<a href="#">Duct Seal Measure Guidance</a>	This guidance provides clarification regarding the duct sealing (SWSV001-04) and duct optimization (SWSV013-02) measure packages and the specific requirements related to: the duct leakage test method, the leakage reduction required to claim this measure, and the building era that can be claimed.
[Being drafted]	<a href="#">Preponderance of Evidence Documentation Requirements for Accelerated Replacement of Deemed Measures</a>	This guidance establishes the documentation requirements for four incentive tiers of accelerated replacement deemed measure claims that are consistent with Resolution E-5115 for custom projects.