

Statewide Measure Development and QA/QC Guidelines

VERSION 2.6.0

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Revision Log

Version	Publish Date	Description of Revisions	Owner
1.0	11/15/2018	Initial version.	Jennifer Holmes, Cal TF Staff
2.0	07/30/2020	Revisions for Guidelines for Data Fields: Added detail and clarifications for numerous fields. Added Revision Log Revisions to Guidelines for Characterization Fields: Added detail and clarifications for numerous fields.	Ayad Al-Shaikh, Cal TF Staff Jennifer Holmes, Cal TF Staff
2.2	08/26/2021	Revisions to align with eTRM version 2.2 Defined new data fields: <ul style="list-style-type: none"> - Unit Gas Infrastructure Benefits - Unit Refrigerant Costs - Unit Refrigerant Benefits - Unit Miscellaneous Costs - Miscellaneous Cost Description - Unit Miscellaneous Benefits - Miscellaneous Benefits Description - Version Source - Electric Benefits - Gas Benefits - TRC Cost – No Administrative Cost - PAC Cost – No Administration Cost - TRC Ratio – No Administrative Cost - PAC Ratio – No Administrative Cost - Total System Benefit - Other Benefits - Other Costs - Measure Technology ID - Pre-Existing Technology ID - Standard Technology ID - Pre-Existing Technology Group - Standard Technology Group - Pre-Existing Technology Type - Standard Technology Type - ETP Flag - ETP First Year Introduced to Programs Attached file with examples of exclusions tables Revisions for clarification throughout	Ayad Al-Shaikh, Cal TF Staff Jennifer Holmes, Cal TF Staff

Version	Publish Date	Description of Revisions	Owner
2.2.1	08/26/2021	Fixed URL links Attached .xlsx file with examples of exclusions tables to PDF	Jennifer Holmes, Cal TF Staff
2.3		Revisions to align with eTRM version 2.3 Inserted new eTRM logo on cover page Inserted "Additional Resources" section and relocated contents from the former Resources chapter into this section Moved Effective Date and End Date fields from characterization section to measure summary section Updated Data Collection Requirements field with Resolution E-5152 requirements. Added RACC requirements to Non-energy Impacts field Included details regarding rounding and significant figures in First Baseline Energy Savings section. Added additional guidance for Offering ID and Offering Description Defined new fields: <ul style="list-style-type: none"> - PA Lead - Added Conventions chapter for parameters, value tables, calculations 	Jennifer Holmes, Cal TF Staff Ayad Al-Shaikh, Cal TF Staff
2.4	12/14/2022	Revisions to align with eTRM version 2.4. Added to the Peer Review QA/QC checklist in the Guidelines for Characterization Fields, Measure Case Description subsection. Clarified language in the Guidelines for Data Fields, Measure Summary subsection. Removed the exception to the significant figures (sig figs) language in the Guidelines for Data Fields Section, First Baseline – Electric Savings subsection since the eTRM will always display 3 sig figs. Removed language regarding whole-building data in the Guidelines for Data Fields Section, Energy Use subsections. Update/added to the Conventions section: <ul style="list-style-type: none"> – Parameter List: Updated list to remove the IE-Table name parameter since it is no longer used. – Value Table List: Updated list to include the Interactive Effect Applicability value table. Calculation Conventions: Added conventions for the new water and embedded energy calculations. Added the Cost Effectiveness Tool (CET) Run Input Data Conventions section. Added guidelines from E5221 into the appropriate Data and Characterization fields (i.e. Building Type).	Tomas Torres-Garcia, Cal TF Staff

Version	Publish Date	Description of Revisions	Owner
2.5	06/30/2023	<p>Revisions to align with eTRM version 2.6.</p> <p>Updated references in the Guidelines for Characterization fields, Life Cycle section, Life Cycle subsection.</p> <p>Updated the Guidelines for Data Fields section, Program Administrator subsection to remove “IOU” specific language. “IOU” is no longer supported since moving to SW measure packages.</p> <p>Updated the Peer Review QA/QC checklist in the Guidelines for Data Fields section, Water Savings subsection, Water Measure Type field.</p> <p>Defined new data field in the Guidelines for Data Fields section, Cost Effectiveness Outputs subsection:</p> <ul style="list-style-type: none"> - Water Energy Benefits 	Tomas Torres-Garcia, Cal TF Staff
2.5.1	10/11/2023	<p>Revision to include additional convention information</p> <ul style="list-style-type: none"> - Add measure specific parameters information to parameters list - Reorder value tables list to include savings and costs tables - Added conventions for measure characterization elements: value table, calculation and API definitions, references, and images and video 	Chau Nguyen, Cal TF Staff
2.6.0	11/17/2023	<p>Revisions required for release 2.7.0 of eTRM:</p> <ul style="list-style-type: none"> - New fields of Class 1st and 2nd Baseline and Restricted Permutation - Updated Parameter List order for new Class Parameters - Add guidance on calculation, convention, and use of Restricted Permutation field 	Chau Nguyen, Cal TF Staff



Preface

Historically, the California investor-owned utilities (IOUs) developed and submitted new energy efficiency measures to the California Public Utilities Commission (CPUC) for approval. The technical analysis, inputs, and impact estimates were documented in “workpapers”, which are now called “measure packages”.¹ Prior to the consolidation of utility-specific deemed measures to statewide measures, energy efficiency measures met the specific needs of the “sponsor” or “lead” IOU, and measure developers and other IOU staff followed the internally-developed guidelines, review requirements, and governance procedures established by the IOU prior to submitting workpapers to the CPUC.

In late 2016, the CPUC staff directed the IOU program administrators (PAs) to develop *statewide measure packages* for new measures.² That is, the measure definition, technical analyses, inputs, applicable markets, building types, etc. need to represent the interests of “more than one” PA.

The California Technical Forum (Cal TF) Staff developed these *Statewide Measure Development and QA/QC Guidelines* (“Guidelines”) to ensure each statewide measure meets all data specification requirements and that measure development and QA/QC guidelines are established for measure developers and reviewers. The ultimate objective is to ensure high-quality measures that embody an appropriate level of technical rigor, represent industry best-practices, are well documented, and are transparent with respect to methods and inputs. In addition to clarifying expectations for the measure and permutation data fields, the Cal TF website provides various tools and resources that are intended to increase measure quality, accuracy, transparency, and standardization (<http://www.caltf.org/tools>).

The first version of these Guidelines was based on extensive Cal TF Staff review of internal guidelines for measure workpaper development, reviews, and approvals provided by Southern California Edison (SCE), Pacific Gas and Electric (PG&E), and San Diego Gas and Electric (SDG&E). Cal TF Staff also reviewed the CPUC ex ante review team feedback on utility-developed workpapers, issues and trends that the CPUC ex ante review team identified with the IOU non-DEER workpapers, workpaper dispositions, preliminary and final workpaper reviews, abstract reviews, and the Energy Savings and Performance Incentive (ESPI) scoring reports for each IOU for year-end 2015 and mid-year 2016. Finally, the first version of the Guidelines was informed by Cal TF Staff experience with utility-developed measure packages and insights gained through the statewide measure consolidation efforts.

The Guidelines are updated as necessary to reflect the current eTRM version and data specification, as well as current regulatory direction and PA expectations for statewide deemed measures. The current version of the Guidelines can be accessed from the Cal TF website (<http://www.caltf.org/tools>).

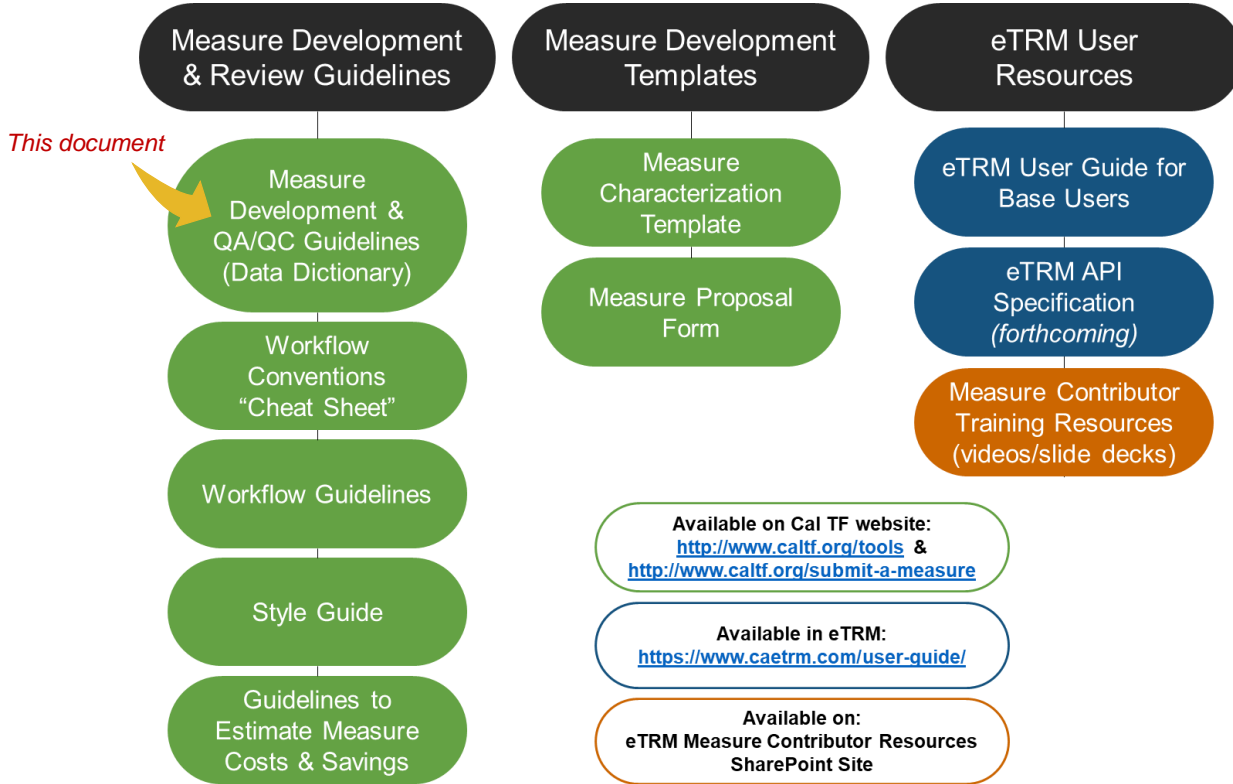
¹ California Public Utilities Commission (CPUC). 2021. Resolution E-5152. Approval of the Databases for Energy-Efficiency Resources updates for Program Year 2023 and revised version for Program Years 2022 and 2021. August 5. Pp 7-8.

² Specifically, the guidance states that “[o]nly one workpaper may be submitted for each set of programs/measures which are adopted by more than [one] program administrator; such workpapers have been termed “statewide workpapers” and program administrators have been directed to collaborate on such efforts.”

Commission ex ante team. 2016. “2017 Workpaper Guidance.” Memorandum submitted to California Energy Efficiency Program Administrators. November 14.

Additional Resources

To support measure development and peer review QA/QC, the Cal TF provides several tools and resources for measure developers and reviewers. Most measure development resources are posted on the “Tools” page of the [Cal TF website](http://www.caltf.org) and a SharePoint site.



Note that the “Exclusion Tables Examples 2021.08.25.xlsx” referenced for several data fields in this document is attached to this PDF file and can also be downloaded from the Cal TF website from the “Tools” page (<http://www.caltf.org/tools>).

Two other prominent resources are:

The *Statewide Measure Characterization Template* is a Word document that contains all Characterization fields. A measure developer can use this template to draft content of some or all Characterization fields. This template includes “boilerplate” text and tables that can be customized but that will also ensure standardization across eTRM measures. (Note that this template does not support automatic uploading of Characterization fields; Characterization fields in the eTRM must be completed manually.)

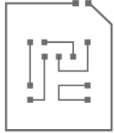
The *Style Guide* provides guidelines for writing conventions, such as word and number usage, expressions of common units of measurement, and citation style.

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Overview

The *Statewide Measure Development and QA/QC Guidelines* (“Guidelines”) provides specific guidance for measure development, quality assurance and quality control (QA/QC), and management approval of a statewide deemed measure before the measure version is advanced for review by the California Technical Forum (Cal TF) and California Public Utilities Commission (CPUC). These Guidelines are not intended to replace existing governance procedures within organizations that develop deemed measures; rather, they are intended to supplement any such existing procedures to ensure standardization and transparency of statewide measures in the eTRM.

Scope

The Guidelines are applicable to the development of a new measure, as well as to the revision of an existing measure to reflect new measure offerings, state or federal code changes, dispositions and guidance issued by the CPUC Energy Division (or its Ex Ante Review consultants), updated evaluation, measurement and verification (EM&V) or other research, and/or other changes.

Measure development stages are represented by the measure status designation in the measure development and review workflow in the eTRM. These Guidelines are applicable to and should be referred during all measure statuses prior to the Submitted to CPUC status.

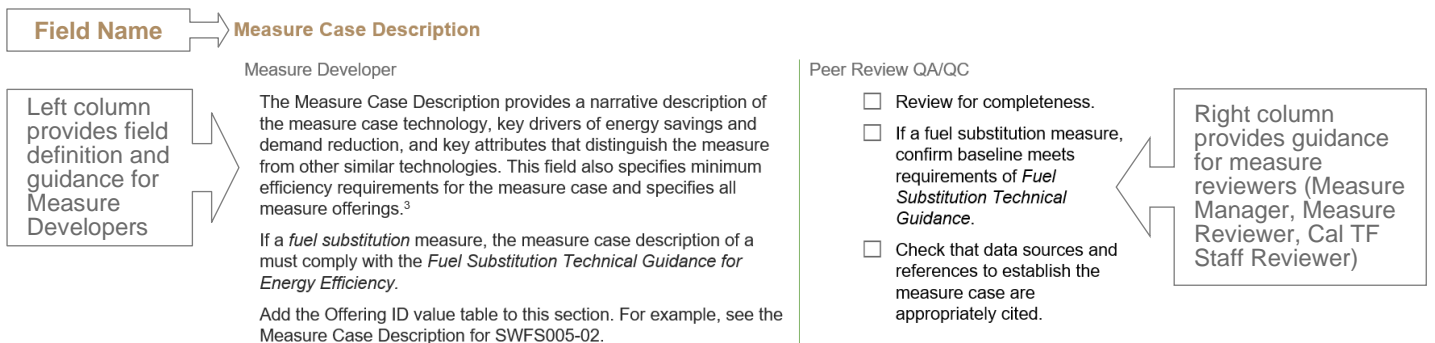
Intended Audience

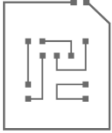
The intended audience of these Guidelines is a Base User with an assigned a measure contributor role who participates in the development or review of a new measure or the update of an existing measure version.

How to Use the Guidelines

The Guidelines present definitions and supplementary information for each field in the eTRM data specification. As such, *these Guidelines serve as the eTRM data dictionary.*

An example of how each field is presented is depicted below:





Guidelines for Characterization Fields

This chapter describes each field included in the Characterization tab in the eTRM. Collectively, the Characterization fields describe the measure and explain the data sources and analysis methods to derive energy use, energy and demand impacts, and other cost effectiveness metrics.

Resources and support for statewide measure development are available on the “Tools” page of the Cal TF website (<http://www.caltf.org/tools>). Measure developers and reviewers can utilize the *Statewide Measure Characterization Template* and the *Style Guide* for specific guidelines, conventions, and expectations for the documentation for all assumptions, values, inputs, and references utilized for the measure.

Technology Summary

Measure Developer

The Technology Summary presents a detailed technical description of the measure and its market potential, includes summaries of relevant studies (e.g., EM&V, market, baseline studies) that collectively document the development and demonstration of the technology and its applications.

This field should also include concise summaries of any relevant studies that were utilized to develop the base case and measure case specifications, and that informed the measure development (even if the study did not directly inform calculations).

The Technical Summary should include justification if the measure is proposed as an Emerging Technology (ET) and/or if the ET net-to-gross ratio³ is specified. If the measure research was funded through the Emerging Technologies Program, add the Emerging Technologies value table and cite the study.

For example, see SWFS016-02

Emerging Technologies

ETP FLAG (PROJECT NUMBER) (TEXT) R1040	PROGRAM FUNDING YEAR (TEXT)
ET15SCE1010	2013-2015

Peer Review QA/QC

- Review for completeness.
- Check that data sources and references are appropriately cited.

³ California Public Utilities Commission (CPUC). 2012. Decision 12-05-015 in the Order Instituting Rulemaking to Examine the Commission’s Post-2008 Energy Efficiency Policies, Programs, Evaluation, Measurement, and Verification, and Related Issues (R.09-11-014). Issued May 18, 2012. Ordering Paragraph 14.

Measure Case Description

Measure Developer

The Measure Case Description provides a narrative description of the measure case technology, key drivers of energy savings and demand reduction, and key attributes that distinguish the measure from other similar technologies. This field also specifies minimum efficiency requirements for the measure case and specifies all measure offerings.⁴

If a *fuel substitution* measure, the Measure Case Description must comply with the *Fuel Substitution Technical Guidance for Energy Efficiency*.

Add the Offering ID dynamic value table to this section. For example, see the Measure Case Description for SWFS005-03.

Offering ID

STEAMER TYPE	STATEWIDE MEASURE OFFERING ID (TEXT)	MEASURE OFFERING DESCRIPTION (TEXT)
Electric	A	Efficient commercial steamer, electric
Gas	B	Efficient commercial steamer, gas

Peer Review QA/QC

- Review for completeness.
- If a fuel substitution measure, confirm baseline meets requirements of *Fuel Substitution Technical Guidance*.
- Check that data sources and references to establish the measure case are appropriately cited.
- Check that CPUC disposition placeholder reference has been added correctly at the end of the section.

Base Case Description

Measure Developer

The Base Case Description provides a narrative description of base case technology and specifies the base case for each measure offering. This description includes documentation and any insights related to industry standard practice (ISP) and codes and standards that could affect the base case of the measure.

If a *fuel substitution* measure, the Base Case Description must comply with the *Fuel Substitution Technical Guidance for Energy Efficiency*.

Add the Base Case Descriptions dynamic value table to this section. For example, see the Base Case Description for SWFS005-03.

Base Case Descriptions

STEAMER TYPE	STATEWIDE MEASURE OFFERING ID (TEXT)	EXISTING DESCRIPTION (TEXT)	STANDARD DESCRIPTION (TEXT)
Electric	A	Standard commercial steamer, electric	Standard commercial steamer, electric
Gas	B	Standard commercial steamer, gas	Standard commercial steamer, gas

Peer Review QA/QC

- Review for completeness.
- If a fuel substitution measure, confirm baseline meets requirements of *Fuel Substitution Technical Guidance*.
- Check that data sources and references to establish the baseline are appropriately cited.

⁴ A **measure offering** is represented by a unique combination of measure determinants that are specifically defined for each measure. A high-efficiency clothes washer measure, for example, might include numerous measure offerings defined by combinations of configuration (front or top loading) and tub capacity.

Code Requirements

Measure Developer

Codes and standards can impact the assumptions and inputs of the energy savings and demand reduction calculations.

The Code Requirements field specifies all federal and/or state regulations that govern the minimum energy use requirements of the measure. This field includes a narrative description of the minimum requirements of applicable state and federal codes and a clear definition of the code efficiency level for the calculation of measure impacts. If state and/or federal codes do not apply, indicate which code is most relevant and why it does not apply.

Commonly referenced sources include (but are not limited to): California Building Energy Efficiency Standards (Title 24 of the CA Code of Regulations), California Appliance Efficiency Program Codes (Title 20), and Title 10 of the Code of Federal Regulations.

Include the Applicable State and Federal Codes and Standards static table.

Applicable State and Federal Codes and Standards

CODE	APPLICABLE CODE REFERENCE	EFFECTIVE DATE
CA Appliance Efficiency Regulations – Title 20	None.	n/a
CA Building Energy Efficiency Standards – Title 24	None.	n/a
Federal Standards	None.	n/a

Peer Review QA/QC

- Review for completeness.
- Confirm that the most recent versions of the State and Federal standards are referenced.
- Check that each referenced code specifies the relevant section/subsection(s) and effective date(s) are provided.
- Check that a complete citation of the applicable code reference(s) is(are) provided.
- If state and/or federal codes do not apply, “n/a” is indicated in the summary table.

Program Requirements

Measure Developer

The Program Requirements field provides all eligibility requirements for implementation of the measure. Elements of this field are specified below:

Measure Implementation Eligibility: Designates the Measure Application Types, Delivery Type, and Sector combinations for which impacts have been developed.

Add the Implementation Eligibility dynamic value table to this section.

For example, see the Program Requirements for SWFS005-03.

Implementation Eligibility

MEASURE APPLICATION TYPE	SECTOR	DELIVERY TYPE
NC	Ag	DnDeemDI
NC	Ag	DnDeemed
NC	Ag	UpDeemed

Accelerated Replacement Requirements (if applicable): Designates implementation requirements such as installation verification, inspection protocols, and preponderance of evidence (POE) requirements for accelerated replacement measures. For example, see Program Requirements for SWWH045-01.

Fuel Substitution Measure Requirements (if applicable): Summarizes the measure passes all parts of the Fuel Substitution Test and requirements defined in *Fuel Substitution Technical Guidance for Energy Efficiency*. For example, see the Program Requirements for SWAP014-01.

Eligible Products: Specifies attributes of eligible products, particularly that related to Measure Case Description

Eligible Building Types and Vintages: Specify all eligible building types and vintages and include explanation of building types that are particularly relevant for the measure and/or represent biggest opportunities for energy savings/demand reduction. Note that per Resolution E-5221 Attachment A, effective PY2024, certain Building Types and Vintages are only eligible for specific delivery types.⁵

Eligible Climate Zones: Specify all eligible climate zones. Note that statewide measures should be eligible in all California climate zones. If not, explain.

Peer Review QA/QC

- Review for completeness.
- Confirm accuracy of each Measure Application Type/Delivery Type/Sector combination in the Implementation Eligibility table.
- If AR Measure Application Type is specified, confirm inclusion of all implementation requirements such as preponderance of evidence (POE) requirements.
- If a fuel substitution measure, confirm measure passes all parts of Fuel Substitution Test and that Fuel Substitution Calculator file is cited and provided as a reference.
- Confirm pre/post verification requirements and other requirements needed for application review, rebate processing, and evaluation.
- Review for correct designation of eligible products, building types and vintages, and climate zones.
- Confirm measure is applicable for statewide implementation (i.e., all California climate zones). If not, ensure rationale is provided and is defensible.

⁵ California Public Utilities Commission (CPUC). 2022. Resolution E-5221: Attachment A. November 3.

Program Exclusions

Measure Developer

The Program Exclusions field shall state any rules or restrictions that limit the eligibility of the measure, such as markets, building types. If no exclusions, state "None."

Peer Review QA/QC

- Review for completeness.

Data Collection Requirements

Measure Developer

This field documents data requirements and timeline if additional data is needed to improve robustness and precision of measure energy and demand impact estimates and/or if required for future EM&V. This field shall also include a summary of sensitivity analyses that identify variables that are key drivers of measure impacts and/or cost effectiveness. Key considerations to identify future data collection needs are:

- The level of rigor and statistical significance of current data/estimates
- When current data will become out-of-date (i.e., costs due to changing market)
- Appropriateness of current data to the measure (e.g., geography, business type, technology, intended target market)
- If current data meets minimum industry best practices of "best available data"
- Additional data/information that is needed to substantiate, augment, or replace current data
- Availability of more recent studies/data (completed or in progress)
- How additional data might impact the inputs and the resultant energy and demand impact estimates. (For example, new measures may require data collection as part of program implementation or for longer-term studies, and products may start out as low impact but move to high impact later.)
- The timeline required for additional data collection (particularly in relation to measure updates)

Include data collection to ensure compliance with Resolution E-5221. E-5221 requires "PAs to provide site data consistent with the CA EM&V protocols for all claims for upstream and midstream delivery types. ... to address recurring concerns with upstream and midstream programs, and systematically capture the data needed to evaluate these programs. The general requirements are provided in the California EM&V Protocols and an example of the updated data specification is provided in Attachment Section 5.1." of E-5221.⁶

Refer to the Statewide Measure Characterization Template for list of static value tables to include.

Peer Review QA/QC

- Review for completeness.
- Review for compliance with Resolution E-5221, if applicable.

⁶ California Public Utilities Commission (CPUC). 2021. *Resolution E-5221*. August 6.

Use Category

Measure Developer

Specify the statewide end-use category that is applicable for the measure. Available end-use categories are available in the UseCategory shared measure parameter table of the eTRM.

Peer Review QA/QC

- Confirm the correct Use Category is assigned to the measure.

Electric Savings

The Electric Savings and Gas Savings fields provide a detailed, comprehensive, and defensible explanation of methodology, inputs and assumptions to derive estimates of electric unit energy consumption (UEC) and unit energy savings (UES). The methodologies must be presented in a logical and consistent order and need to be understood by a variety of energy efficiency professionals.

The contents of this field will explain and cite all references for inputs, assumptions, and methods to derive UES values, including (but not limited to): EM&V reports, workpaper (measure package) dispositions, and M&V studies.

Unit energy savings (UES) are typically estimated using one of the following four methods:

Modeled Energy Use: uses whole-building energy modeling to simulate energy use and energy/demand impacts. This approach includes variants: DEER, DEER-Modified, and Measure Developer Modeled

Engineering Calculations: use of widely accepted and relatively simple calculations based upon sound engineering principles to calculate energy and demand impacts.

Calculation Tool: the use of an industry-accepted software to calculate measure impacts, that typically require user-selected inputs to calculate impacts through embedded (protected) macros or formulae.

Adopted from Another Source: pertains to the adoption of estimated impacts *without modification* from an M&V study (such as an emerging technology study or a lab test report), custom project collections, or a study conducted for another purpose.

If applicable, the DEER Measure and DEER Run IDs should be the first source considered to substantiate energy savings estimates, unless the measure developer believes the relevant DEER values do not represent the “best available data.”

Even if the measure is not in DEER, DEER assumptions and methodologies must be used (e.g., hours of operation, interactive effects, baseline of similar measures).

Measure Developer

The general organization and guidelines for the Electric Savings field content for each method is outlined below.

Modeled Approach

Refer to the Statewide Measure Characterization Template for specific guidelines and documentation requirements.

See SWCR003-01 as an example.

Engineering Calculations, Calculation Tool, and Adopted from Another Source Approaches:

Narrative explanation of the methodology and key drivers (influential variables) of energy use.

Presentation of equations that represent the calculation of base and measure case UEC and UES. All variables are defined with units following each equation.

One or more tables with input values and assumptions (corresponding to all variables in the presented equations) for the calculation of savings, accompanied by a discussion of the source/derivation of each.

Sample calculation

Refer to the Statewide Measure Characterization Template for additional guidelines and documentation requirements.

See SWFS011-01 as an example.

Note that if UES estimates are not normalized by the normalizing unit, this must be discussed and made clear for transparency in this section.

Peer Review QA/QC

- The narrative thoroughly documents methods to derive the estimates of energy savings and demand impacts. All methods must be reproducible.
- The methodology is presented in a logical manner and will be easily followed and understood.
- The methodology represents industry best practices and accepted engineering and statistical principles.
- All UES estimates are normalized to the appropriate unit of measurement.
- A sample calculation is provided and accurate (if applicable).
- DEER values or methods are used, if possible.
- All data sources and references are appropriately cited
- All data sources, cited references, and data files are provided.
- If a modeled approach was followed, the documentation follows the Modeled Savings Methodology Template in the Statewide Measure Characterization Template.
- If a modeled approach was followed, all simulations are documented and reproducible (if applicable).
- All calculations are accurate (if applicable).
- All calculations are reproducible (if applicable).
- If a normal replacement (NR) or accelerated replacement (AR) Measure Application Type, the UES calculations are provided for both baseline periods.

Peak Electric Demand Reduction

Measure Developer

See [Electric Savings](#).

The demand reduction calculations/estimates must consider the current peak demand period delineated by climate zone.⁷

If a coincident demand factor (CDF) is applied, include the calculation and the CDF value table; the reference for the CDF value must be cited and provided.

Peer Review QA/QC

- See [Electric Savings](#).
- Confirm application of correct peak demand period.
- If applicable, confirm correct CDF and reference is cited.

Gas Savings

Measure Developer

See [Electric Savings](#).

Peer Review QA/QC

- See [Electric Savings](#).

Life Cycle

Measure Developer

The estimated useful life (EUL) describes an estimate of the median number of years that the measures installed under the program are still in place and operable. The remaining useful life (RUL) is an estimate of the median number of years that a measure being replaced under the program would remain in place and operable if the program intervention had not caused the replacement.

This field provides an explanation of the source and derivation of the EUL and the RUL, if applicable. If no other documentation or supporting information is available, RUL can be assumed to be 1/3 of the EUL.⁸

If an EUL or RUL does not exist for the measure, research and recommend an appropriate value. Documentation and rationale for recommended value(s) should be included in this Characterization field.

Include the Effective Useful File and Remaining Useful Life dynamic value table to this section.

If the Measure Application Type is add-on equipment (AOE) or accelerated replacement (AR), the Effective Useful Life and Remaining Useful Life – Host dynamic value table may be included. Configure columns similar to the EUL dynamic table, replacing EUL_Yrs with RUL_Yrs. If EUL ID = RUL ID, then include just the EUL table and display both EUL_Yrs + RUL_Yrs columns.

Peer Review QA/QC

- Review for completeness.
- Confirm correct designation of measure and host equipment.
- Review for consistency of assigned EUL and RUL with “like” measures.
- Confirm original source of the EUL and basis for RUL (if applicable) are cited.
- Confirm all documentation of cited references are provided and verified.

For example, see Life Cycle for SWFS005-03

[Effective Useful Life and Remaining Useful Life](#)

EFFECTIVE USEFUL LIFE ID	EUL DESCRIPTION (TEXT)	SECTOR (TEXT)	EUL YEARS (YR)	START DATE (TEXT)	EXPIRE DATE (TEXT)
Cook-EtecStmCooker	Steam Cooker (electric)	Com	12.00	2013-01-01	

⁷ California Public Utilities Commission (CPUC). 2018. *Resolution E-4952*. October 12. OP 1.

⁸ California Public Utilities Commission (CPUC), Energy Division. 2020. *Energy Efficiency Policy Manual Version 6*. Page35.

Base Case Material Cost

Measure Developer

This field shall fully explain and cite all data sources and analytical methods used to estimate the base case material cost. The explanation should include the rationale for the analytical method chosen.

Sources for cost data include (but are not limited to):

- Cost studies by PAs or the CPUC consultants
- Program and invoice data from PAs and vendors
- Online retailers (web-scraped data) and point-of-sale data
- Wholesale costs supplemented by bulk purchase discounts, contractor mark-ups
- Warranties, and other factors that determine the retail price
- Construction estimation resources, such as RSMMeans
- DOE or Title 24 rulemaking technical support documents

Analytical methods depend upon the characteristics of the cost data and include simple average, weighted average, median, lower-quartile, regression analysis, hedonic cost model.

Peer Review QA/QC

- Confirm material costs do not include installation labor or maintenance costs.
- Review for completeness and that the derivation of costs is fully explained.
- Determine that cost data sources and analysis methodology meet industry best practices.
- Confirm that costs are normalized to the correct unit of measurement.
- Confirm all documentation of cited references are provided and verified.

Measure Case Material Cost

Measure Developer

See [Base Case Material Cost](#)

If a fuel substitution measure, explain and document estimated infrastructure costs.

Peer Review QA/QC

- See [Base Case Material Cost](#).

Base Case Labor Cost

Measure Developer

The Base Case Labor Cost field shall include an explanation and cite all data sources and research utilized to estimate the base case labor cost.

Note that for most new construction (NC) and normal replacement (NR) Measure Application Types, the installation labor cost for the base and measure cases will be the same and thus not estimated. If so, the measure developer should include a statement to note as such.

Peer Review QA/QC

- Review for completeness and that the derivation of costs is fully explained.
- Determine that labor cost sources and analysis methodology meet industry best practices.
- Costs are normalized to the correct unit of measurement.
- Confirm all documentation of cited references are provided and verified.

Measure Case Labor Cost

Measure Developer

See [Base Case Labor Cost](#)

Peer Review QA/QC

- See [Base Case Labor Cost](#)

Net-to-Gross (NTG)

Measure Developer

This field provides a generic definition of the NTG ratio and includes an explanation of derivation and source of the NTG ratio(s) specified for the measure.

This section needs to include all the applicable Net to Gross Ratio dynamic value tables:

- Net to Gross Ratio
- Net to Gross Ratio – Nonresidential
- Net to Gross Ratio – Residential

For example, see Net-to-Gross for SWFS005-02.

Net to Gross Ratio – Nonresidential

NET TO GROSS RATIO ID	NTGRKWH (RATIO) R103	NTGR THERM (RATIO) R103
Agric-Default>2yrs	0.6000	0.6000
Com-Default>2yrs	0.6000	0.6000
Ind-Default>2yrs	0.6000	0.6000

Peer Review QA/QC

- Confirm specification of the correct and approved NTG ratio(s).
- Confirm original source of the NTG ratio(s) is(are) cited.
- Confirm all documentation of cited references are provided and verified.

Gross Savings Installation Adjustment (GSIA)

Measure Developer

This field includes an explanation of the derivation/source of the gross savings installation adjustment (GSIA) rate and the justification for the measure.

The GSIA factor combines the *realization rate* and the *installation rate*. It is dependent on the measure technology and how the measure is delivered.

The installation rate is the ratio of verified installations of a measure to the number of claimed installations. Typically, the installation rates applied on an ex ante basis are based upon previous ex post evaluations.

The realization rate represents the ratio of achieved impacts to predicted impacts.

Include all the applicable Gross Savings Installation Adjustments dynamic value tables:

- Gross Savings Installation Adjustments
- Gross Savings Installation Adjustments – Default

For example, see Gross Savings Installation Adjustment (GSIA) for SWFS005-02.

Gross Savings Installation Adjustments – Default

GSIA ID	GSIA (RATIO) R1270
Def-GSIA	1.0000

Peer Review QA/QC

- Ensure specification of the correct and approved GSIA factor(s).
- Confirm original source of the GSIA factor(s) is(are) cited.
- Confirm all documentation of cited references are provided and verified.

Non-Energy Impacts

Measure Developer

This field explains the methodology and associated inputs and assumptions to derive non-energy impacts, such as water savings. For projects that also save water, the Water-Energy Calculator must be used to determine the embedded energy savings that can be claimed and develop a separate water energy nexus measure package.

Completion of this field should follow guidance provided for the [Electric Savings](#) field.

If the retrofit involves *adding* (not replacing) equipment that uses refrigerant, such as fuel substitution and electric resistance to heat pump measures, or measures for which low global warming potential (GWP) refrigerant measure benefits will be claimed, use the refrigerant avoided cost calculator (RACC) to compute refrigerant leakage avoided costs (RLAC). Include table of outputs. (Refer to the Statewide Measure Characterization Template for additional guidelines and documentation requirements.)

If non-energy impacts have not been derived or are not applicable, this field should state “Non-energy impacts have not been derived for this measure.” or “Non-energy impacts are not applicable for this measure.”

Peer Review QA/QC

- See [Electric Savings](#).
- If applicable, confirm RLAC are reported and RACC workbook with addendum are provided as references.
- If measure results in embedded savings due to water savings: confirm correct water-energy nexus calculator was used to compute water energy intensity factors and that embedded energy savings were calculated.

DEER Differences Analysis

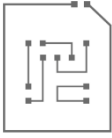
Measure Developer

This field provides a summary table of DEER-based inputs and methods, and the rationale for inputs and methods that are not DEER-based.

Peer Review QA/QC

- Review the DEER Difference Summary table for completeness and consistency with inputs and methods adopted to develop the measure.

Guidelines for Data Fields



This chapter provides a guidance for the development and review for each data field needed to generate the permutations for a measure. Many data fields have a companion field in the Characterization that explains the source, inputs, and methodology to derive the data value.

For ease of navigation, the data fields are presented in the following groupings:

- | | |
|--|---|
| Measure Summary | Life Cycle |
| Permutation Characterization | Energy Use |
| Common Measure Parameters | Implementation Parameters |
| First Baseline Energy Savings | Cost Effectiveness Parameters |
| Second Baseline Energy Savings | Other |
| Costs | |

Refer to the Conventions chapter for standard parameter, value table, and calculation names and APIs.

Refer to the Conventions chapter for the standard mapped object (e.g., parameter, value table column, etc.) for each data field

Measure Summary

Statewide Measure ID

Measure Developer

The Statewide ID identifies a unique measure and is based on the Use Category.

The nomenclature of this identifier is shown below. This convention is tied to CEDARS categories.

The Statewide Measure ID is auto-generated by the eTRM to ensure that numbers to not duplicate.

Peer Review QA/QC

- Review the Statewide ID and verify that the correct “Use Category” was chosen for the measure

Mapped Object: Auto

Example	SWAP001-01-01				
Statewide Designator	Use Category	Measure Number	Version/Minor Version Designator	Version Number	Minor Version Number
SW	AP - Appliance & Plug Loads BE - Building Envelope CR - Commercial Refrigeration CA - Compressed Air FS - Food Service HC - HVAC LG - Lighting MI - Miscellaneous PR - Process RE - Recreation SV - Service WB - Whole Building WH - Service & Domestic Hot Water WP - Water Pumping / Irrigation	Automatically assigned, starts at 001 for the first measure in the end use category.	-	Automatically assigned, starting at 01 for the first “Published” version of a measure package (MP).	Automatically assigned, starting at 01 for the first created draft version of a measure package (MP).

Measure Version ID

Measure Developer

This field is populated from the measure-level data and stored as the “MeasureVersionID”. The field is built from a concatenation of three fields: Measure ID, Version Number, and Minor Version Number to appear in the format below (note that Minor Version Number appears only in the Change Description of a measure):

SWAP001-01-1

Peer Review QA/QC

Not applicable.

Measure Name

Measure Developer

The convention for designating a measure name is provided below. The measure name includes a short concise descriptor of the technology, with Sector, fuel type, or other attributes appended *only* if necessary to distinguish the measure from other available products.

Use commas to separate technology and any appended attributes.

The Measure Name should be *singular* unless it is always installed in multiple quantities. See examples below.

“Boiler, Commercial”

“Floating Suction Controls, Multiplex”

“Low-flow Pre-rinse Spray Valve”

Peer Review QA/QC

- Confirm the measure name is consistent with guidance.

Root technology, Sector, Fuel Type, Fuel Substitution Type			
Root technology	Fuel Type	Sector	Fuel Substitution Type
<p>Technology (noun, singular).</p> <p>Use plural only if more than one is always installed.</p> <p>Only use descriptive or modifying words if necessary to clarify its intended use as add-on equipment, or to distinguish the measure from other measures or from other available technologies.</p> <p>Do not use “Efficient” or “Energy Efficient”.</p> <p>ENERGY STAR is necessary in name only if all offerings are ENERGY STAR.</p> <p>No abbreviations.</p> <p>No acronyms.</p>	<p>Fuel type should only be specified in the measure name if necessary to distinguish from another similar measure and/or if the measure excludes a fuel type that is available in the market.</p> <p>It is not necessary to specify a fuel type if the technology is <i>only</i> available for that fuel type.</p> <p>Do not specify both electric and gas or “all”.</p>	<p>Sector should only be specified in the measure name if necessary to distinguish from another similar measure and/or if excluding specific sectors.</p> <p>Do not specify all sectors or “all”.</p>	<p>Fuel Substitution should only be specified if the measure is a fuel substitution measure.</p>

Effective Start Date

Measure Developer

The Effective Date is set to follow the CPUC approval of the measure. This date will be linked to the “Implementation Dates” that will be used for allowing claims, thus this date is critical. Consult with the lead PA to determine the appropriate effective date.

The Effective Date must follow rules to limit changes to the market. Existing measures will typically require a 90-day lead time before becoming effective so that the transition in the market can be planned. New measures can become effective as soon as they are approved.

Peer Review QA/QC

None.

End Date

Measure Developer

The End Date is the date after which the measure version is no longer eligible to be implemented in any California program.

The End Date is required if specified in a disposition issued by the CPUC Energy Division or its consultants. An End Date is not required but should be considered to trigger review of measure parameters and/or supporting data or assumptions.

Peer Review QA/QC

- End Date specified if required by disposition or if NTG ID is “All-Default<=2yrs” then End Date equals 2 years after Effective Date.
- End Date is typically left blank until a new measure version is created. In this case, the End Date of the previous version is updated to be the day before the Effective Date of the new version as soon as the new version of the measure is approved. This update will be made by the CPUC’s EAR Team.

PA Lead

Measure Developer

PA Lead is the designated IOU or POU responsible for measure development.

This field is entered at the Measure level through the Edit Measure panel.

Required. Must be one of PGE, SCE, SCG, SDGE, LADWP, SMUD, Joint POU.

Peer Review QA/QC

- Verify that a PA Lead has been designated.

Measure Package Cover Sheet

Measure Developer

The Measure Package Cover Sheet file is uploaded by the measure developer as an attachment.

This file is entered at the Measure level through the Edit Measure panel.

Peer Review QA/QC

- Verify that the version that the Cover Sheet documents corresponds to the actual unpublished version in the eTRM.
- Verify that the submission date is accurate.

Offering ID

Measure Developer

Offering ID is a unique identifier for each unique measure offering, based on unique combinations of measure determinants defined for each measure.

Special consideration should be taken to ensure that new offerings IDs is new values. As a best practice, ID used in previous versions of the measure should not be re-used.

Offering ID should be tied to the Offering ID Description in a one-to-one relationship that also spans measure versions.

(see the Offering Description in the Other section for related information)

Peer Review QA/QC

- Verify that Offering IDs are created for each unique measure offering.
- Verify that new Offering IDs added to an existing measure are unique IDs rather than recycled IDs that may have been used in a previous measure version.
- IDs should be chosen from A...Z, then continuing to AA...AZ.

Permutation Characterization

First Base Case Description

Measure Developer

Concatenated description based upon permutation parameters; Description should uniquely describe each permutation with parameters that vary impacts (e.g., savings, cost, life, net results, cost effectiveness).

For example, a First Base Case Description for the Residential Low-flow Showerhead (SWWH002-03) would be “Showerhead, 2.25 gpm, electric, DMO, AOE, CZ01”. The description for Commercial Steamer (SWFS005-02) is simply “Standard commercial steamer, electric” since savings or cost do not vary by Building Type, Measure Application Type, or climate zone.

The correct First Base Case Description must be evaluated for each Measure Application Type specified in the measure permutation. The first baseline is established by the Measure Application Types either the existing condition or the code/industry standard practice.

Measure Application Type	First Baseline
New Construction (NC)	Code/ Standard Practice
New Replacement (NR)	Code/ Standard Practice
Accelerated Replacement (AR)	Existing Condition
Add-on Equipment (AOE)	Existing Condition
Behavior Retro-commissioning, Operational (BRO-xxx)	Existing Condition
Building Weatherization (BW)	Existing Condition

Peer Review QA/QC

- Review for completeness and consistency with guidance.

Second Base Case Description

Measure Developer

Concatenated description based upon permutation parameters. Leave the field blank if no second baseline exists for the measure (i.e., only used for accelerated replacement, AR). While all fields must be mapped, a blank field requires the “Null Values” value table to be imported, and one can chose the “Null Values: Blank” option.

For AR, Second Base Case Description is the code/industry standard practice. For example, a second base case description for the AR Residential Low-Flow Showerhead would be “Showerhead, 1.8 gpm, electric, DMO, AR, CZ01”. All other MATs have a blank field. See SWWH002-03 Measure Offerings value table.

Peer Review QA/QC

- Review for completeness and consistency with guidance.

Measure Case Description

Measure Developer

Concatenated description based upon permutation parameters. The description should uniquely describe each permutation with parameters that vary impacts (e.g., savings, cost, life, net results, cost effectiveness).

For example, a Measure Case Description for Residential Low-Flow Showerhead would be “Efficient flow control valves, 1.0 gpm, electric, DMo, AOE, CZ01”. See SWWH002-03 Measure Offerings value table.

Peer Review QA/QC

- Review for completeness and consistency with guidance.

Existing Description

Measure Developer

Description of the existing condition/equipment that is used to characterize the 1st baseline of AR, AOE, and BRO Measure Application Types.

As an example, for Residential Low-Flow Showerhead the existing condition would be “Inefficient showerhead, 2.25 gpm”.

For example, see SWWH002-03 Base Case Descriptions value table.

If applicable, this field will be used to generate the pre-existing description field (PreDesc) for the CET input file.

Peer Review QA/QC

- Review for completeness and consistency with guidance.

Standard Description

Measure Developer

Description of the code / industry standard practice that is used to characterize the 1st baseline of NR and NC Measure Application Types.

For example, for the Residential Low-Flow Showerhead the Standard Description would be “Title 20 code showerhead, 1.8 gpm”. See SWWH002-03 Base Case Descriptions value table.

If applicable, this field will be used to generate the standard description field (StdDesc) for the CET input file.

Peer Review QA/QC

- Review for completeness and consistency with guidance.

First Baseline Case

Measure Developer

Class categorization of the measure first baseline based on the measure application type.

Case description must agree with the Measure Application Type, as shown below. If measure has multiple MATs with different Case Classes, create the exclusion table:

MeasureApplicationType-ClassFirstBaseline Exclusion Table

MAT	Class First Baseline
AOE	Existing or Standard Practice
AR, BRO, BW	Existing
NC, NR	Standard Practice

Peer Review QA/QC

- Review for completeness and consistency with guidance.
- For existing add-on equipment that is no longer operational, a Standard Practice baseline shall be used when it is replaced.
- Add-on equipment can also be added to host equipment at new construction and may use Standard Practice as the baseline.

Second Baseline Case

Measure Developer

Class categorization of the measure second baseline based on the measure application type.

Case description must agree with the Measure Application Type, as shown below. If measure has multiple MATs with different Case Classes, create the exclusion table:

MeasureApplicationType-ClassSecondBaseline Exclusion Table

MAT	Class First Baseline
AR	Standard Practice
AR, BRO, BW, NC, NR	None

Peer Review QA/QC

- Review for completeness and consistency with guidance.

Common Measure Parameters

Measure Application Type

Measure Developer

Measure Application Type (MAT), also called installation type, classifies an energy efficiency activity and dictates the appropriate baseline treatment, measure effective useful life, eligibility, documentation requirements, and cost calculation methodology.

Peer Review QA/QC

- Verify that all proposed Measure Application Types are specified.

Building Type

Measure Developer

A building type refers to the prototypical building that is meant to represent an average building in California.

The “Com” and “Res” building types represent the weighted average of *all* commercial or *all* residential building types, respectively. Note that per Resolution E-5221 Attachment A, effective PY2024, the “Com” and “Res” building types can only be used for the upstream delivery type.⁹

“Any” should be used to specify measures for which savings do not depend upon Building Type. Note that per Resolution E-5221 Attachment A, effective PY2024, the “Any” building type can only be used for the midstream, downstream, and direct install delivery types.¹⁰

Only Building Type options on the CEDARS building type list are eligible; do not assign “non-standard” building types.

Peer Review QA/QC

- Verify consistency with guidance for the specific building type identified. Specifically, check that Sector is consistently defined.
- If the weighted average Building Type is assigned, (Com or Res) confirm if appropriate. These choices are only appropriate for upstream delivery types effective PY2024 per Resolution E-5221.
- If “Any” is assigned, confirm if appropriate and that savings of the measure do not depend on building type. This choice is only appropriate for midstream, downstream, and direct install delivery types effective PY2024 per Resolution E-5221.

Building Vintage

Measure Developer

Describes the construction of the building, which is typically limited to existing (Ex) or new (New). However, existing buildings are representative of a weighted average of code-based vintage constructions that could also be represented as “Old” or “Rec”.

“Any” should be used to describe cases for which savings do not depend upon Vintage. (A limited number of measures may warrant a sub-vintage category.) Note that per Resolution E-5221 Attachment A, effective PY2024 the use of the “Any” building vintage is no longer allowed.¹¹

“Any” is not a valid vintage option for the shared interactive effects (IE) tables. If calculations require the shared interactive effects (IE) tables, the measure building vintage must be “Ex”, “New”, “Old”, or “Rec” even if savings do not vary by vintage.

If a measure has multiple MATs and Building Vintages, create the MAT – Vintage exclusion table. For example, see the MeasureApplicationType-Vintage exclusion table for SWWH002-02.

MeasureApplicationType-BuildingVintage Exclusion Table

MAT	Vintage
NC	New, Any
NR	Ex, Old, Rec, Any

Peer Review QA/QC

- Verify consistency with guidance: building construction existing (Ex) or new (NC) specified, for existing buildings specific building vintage or sub-vintage identified or “Any” used in cases where savings do not depend on building type.

⁹ California Public Utilities Commission (CPUC). 2022. Resolution E-5221: Attachment A. November 3.

¹⁰ California Public Utilities Commission (CPUC). 2022. Resolution E-5221: Attachment A. November 3.

¹¹ California Public Utilities Commission (CPUC). 2022. Resolution E-5221: Attachment A. November 3.

AR	Ex, Old, Rec
AOE	Ex, Old, Rec
BRO-xxx	Ex
BW	Ex, Old, Rec

Building Location

Measure Developer

Describes the location of the building according to a California climate zone within a utility service territory. The zone that represents a weighted average of the climate zones is referred to as IOU. The term “Any” should be used to describe cases for which savings are not weather dependent.

Peer Review QA/QC

- Verify correct designation of applicable climate zones.
- Verify that values are available for all climate zones. If values are not available for all climate zones, ensure rationale is documented in Program Requirements field.

Normalized Unit

Measure Developer

Savings and costs are expressed by a unit of measure referred to as the Normalized Unit. The Normalized Unit should be consistent across similar measures in a use category. See Technology Type Section.

The measure developer must consider the Normalizing Unit carefully, especially if the base and measure case equipment is significantly different, which occurs more frequently with fuel substitution measures. For example, the heat capacity of a furnace (kBtu/hr) cannot be easily compared to the heat capacity of a heat pump (tons).

Peer Review QA/QC

- Confirm the normalizing unit is appropriate for the measure.
- Confirm the normalizing unit is consistent with similar measures in the use category

Sector

Measure Developer

Sector refers to a group of customers that share common characteristics and barriers upon which energy efficiency strategies are based.

The primary sectors are consistent with CEDARS: Residential, Commercial, Industrial, and Agricultural.

Sector must agree with the Building Type designation, as shown below.

Building Type - Sector Exclusion Table

Sector	Building Type
(any sector)	Any
Agricultural	AgOth, ALF, APF, GHs, VPr
Commercial	Asm, Cnc, Com, CRe, Dat, ECC, EPr, ERC, Ese, EUD, EUn, Fhc, Gro, Gst, HGR, Hsp, Htl, Mtl, Nrs, OfL, OfS, RFF, RSD, Rt3, RtL, RtS, SCn, Sun, Sup, WRf
Industrial	IAT, IBM, ICP, ICS, IFP, IGM, IGP, IndOth, IPe, IPH, IPM, MBT, MCE, MLI, MPF, WWT
Residential	DMo, MFm, MFmCmn, Res, SFm, SMO

For measures with building types spanning multiple sectors, a "Sector – Building Type" exclusion table is required. For example, see SWHC023-02 BuildingType-Sector exclusion table.

Peer Review QA/QC

- Verify applicable Sector(s) are properly identified.

Program Administrator Type

Measure Developer

This field designates permutations specifically to a specific IOU or 'POU'.

If impacts do not vary by IOU/POU area, designate "Any".

When a statewide measure is being retired from use by the IOUs, it should be considered for transfer to a POU-only measure.

Peer Review QA/QC

- Verify properly identified.
- If "IOU" or "POU" is designated, confirm impacts differ across IOU/POU territories.

Program Administrator

Measure Developer

Note that this field is distinct from Program Administrator Type.

This field designates if permutations are applicable to certain California IOUs or RENs (i.e., PA-dependent).

In general, statewide measures are intended to be PA-independent, so all efforts should be made to assign PA = "Any" value. GSIA is one of the more common parameters that could require a PA-dependent permutation.

For example, if the measure impact varies by climate zone (i.e., Building Location = one of the 16 climate zones), then Program Administrator is "Any".

Peer Review QA/QC

- Verify properly identified.

First Baseline Energy Savings

First Baseline – Peak Electric Demand Reduction (kW)

Measure Developer

Peak demand reduction per normalized unit during first baseline period. Conform to the current California peak demand definition.

This field is populated with a calculated value. If possible, demand reduction should be calculated as the difference between baseline and measure case unit demand values.

Methodology is included in the [Peak Electric Demand Reduction](#) Characterization field.

The field for Peak Electric Demand Reduction is *stored* as a decimal data type and always maintains the same number of decimal places as is entered.

The value that is **displayed** to the user and **available** for download (through API, CSV, SQL-mirror database) is rounded to include up to 3 significant figures. Examples are shown below:

# of Sig. Figures	Original Value Stored in eTRM Example UES Value	3 Significant Figures are Displayed and Available for Download Result
6	1,251.06	1,250
4	98.26	98.3
3	5.69	5.69
3	0.179	0.179
3	0.0568	0.0568
3	0.000568	0.000568

Peer Review QA/QC

- Verify peak demand reduction calculation is correct and correct values are aligned in the correct permutation.
- If a fuel substitution measure, confirm "0" demand reduction, as per *Fuel Substitution Technical Guidance*.

First Baseline – Electric Savings (kWh/yr)

Measure Developer

Annual electric UES per normalized unit during first baseline period.

This data field is populated with a calculated value. If possible, savings should be calculated as the difference between baseline and measure case electric UEC values.

Methodology is included in the [Electric Savings](#) Characterization field.

The field First Baseline – Electric Savings is **stored** as Decimal data type and always maintains the same number of decimal places as is entered. The value that is **display** to the user and **available** for download (through API, CSV, SQL-mirror database) is additionally rounded to include up to 3 significant figures. Examples are shown below:

Peer Review QA/QC

- Verify UES calculation is correct and correct values are aligned in the correct permutation.

	Original Value Stored in eTRM		3 Significant Figures are Displayed and Available for Download
# of Sig. Figures	Example UES Value		Result
6	1,251.06		1,250
4	98.26		98.3
3	5.69		5.69
3	0.179		0.179
3	0.0568		0.0568
3	0.000568		0.000568

First Baseline – Gas Savings (therms/yr)

Measure Developer

Annual gas UES per normalized unit during first baseline period.

This data field is populated with a calculated value. If possible, savings should be calculated as the difference between baseline and measure case gas UEC values.

Methodology is included in the [Gas Savings](#) Characterization field.

The field First Baseline – Gas Savings is **stored** as Decimal data type and always maintains the same number of decimal places as is entered. The value that is **display** to the user and **available** for download (through API, CSV, SQL-mirror database) is additionally rounded to include up to 3 significant figures. Examples are shown below:

Peer Review QA/QC

- Verify UES calculation is correct and correct values are aligned in the correct permutation.

	Original Value Stored in eTRM		3 Significant Figures are Displayed and Available for Download
# of Sig. Figures	Example UES Value		Result
6	1,251.06		1,250
4	98.26		98.3
3	5.69		5.69
3	0.179		0.179
3	0.0568		0.0568
3	0.000568		0.000568

Second Baseline Energy Savings

Second Baseline – Peak Electric Demand Reduction (kW)

Measure Developer

Peak demand reduction per normalized unit during second baseline period. Conform to the California peak demand definition.

This data field is populated with a calculated value. If possible, demand reduction should be calculated as the difference between baseline and measure case unit demand values.

The value should equal "0" for a measure without a second baseline (all measure application types, except AR). The value mapped should be from the "Null Values" shared data table, called "Null Values: Energy Rate".

Rules for storing, displaying, and downloading this data match the rules for the First Baseline – Peak Electric Demand Reduction.

Methodology is included in the [Peak Electric Demand Reduction](#) Characterization field.

Peer Review QA/QC

- Verify peak demand reduction calculation is correct and correct values are aligned in the correct permutation.
- If a fuel substitution measure, confirm "0" demand reduction, as per *Fuel Substitution Technical Guidance*.

Second Baseline – Electric Savings (kWh/yr)

Measure Developer

Annual electric UES per normalized unit during second baseline period.

This data field is populated with a calculated value. If possible, savings should be calculated as the difference between baseline and measure case electric UEC values.

The value should equal "0" for measure without a second baseline (all measure application types, except AR). The value mapped should be from the "Null Values" shared data table, called "Null Values: Energy-Electric".

Rules for storing, displaying, and downloading this data match the rules for the First Baseline – Electric Savings.

Methodology is included in the [Electric Savings](#) Characterization.

Peer Review QA/QC

- Verify UES calculation is correct and correct values are aligned in the correct permutation.

Second Baseline – Gas Savings (therms/yr)

Measure Developer

Annual gas UES per normalized unit during second baseline period.

This data field is populated with a calculated value. If possible, savings should be calculated as the difference between baseline and measure case gas UEC values.

The value should equal "0" for measure without a second baseline (all measure application types, except AR). The value mapped should be from the "Null Values" shared data table, called "Null Values: Energy-Gas".

Rules for storing, displaying, and downloading this data match the rules for the First Baseline – Gas Savings.

Methodology is included in the [Gas Savings](#) Characterization field.

Peer Review QA/QC

- Verify UES calculation is correct and correct values are aligned in the correct permutation.

Costs

First Baseline Labor Cost (USD)

Measure Developer

Base case labor cost per normalized unit applicable to first baseline period. A standard table format is used to include this data.

Cost is equal to "0" if an existing conditions base case is used to represent full measure cost (for example, Delivery Type of Direct Install or Measure Application Types of AR, AOE, BRO-RCx, or BW).

A description of the cost data is included in the [Base Case Labor Cost](#) Characterization field.

Note that per Resolution E-5221, effective PY2024, "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."¹²

Peer Review QA/QC

- Confirm labor cost data meets "best available data" guidelines (e.g., valid source, age of data, size of sample, etc.)
- Verify that data is rounded to the appropriate precision.
- When the Normalizing Unit is very small, the limit of 2 decimal places many need to be over-ridden by changing the units from "USD" to "USD/unit" in the cost table or calculation.

First Baseline Material Cost (USD)

Measure Developer

Base case material cost per normalized unit applicable to first baseline period. A standard table format is used to include this data.

Cost is equal to "0" if an existing conditions base case is used to represent full measure cost (for example, Delivery Type of Direct Install or Measure Application Types of AR, AOE, BRO-RCx, or BW).

A description of the cost data is included in the [Base Case Material Cost](#) Characterization field as a reference.

Note that per Resolution E-5221, effective PY2024, "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."¹³

Peer Review QA/QC

- Verify that data is rounded to the appropriate precision.
- When the Normalizing is very small, the limit of 2 decimal places many need to be over-ridden by changing the units from "USD" to "USD/unit" in the cost table or calculation.

¹² California Public Utilities Commission (CPUC). 2022. Resolution E-5221. November 3.

¹³ California Public Utilities Commission (CPUC). 2022. Resolution E-5221. November 3.

Measure Total Cost 1st Baseline (USD)

Measure Developer

Calculated value of incremental cost per normalized unit:
(Measure Labor Cost + Measure Material Cost) –
(First Baseline Labor Cost + First Baseline Material Cost)

This data field is populated with a calculated value.

Standard rules apply for the correct value of First Baseline cost that vary with Measure Application Type.

This value is reported directly for both claims and cost-effectiveness runs.

Peer Review QA/QC

- Verify incremental cost calculation is correct. Note that the incremental cost matches the full measure cost when the base case cost is zero.
- When the normalizing unit is very small, the limit of 2 decimal places many need to be over-ridden by changing the units from “USD” to “USD/unit” in the cost table or calculation.

Measure – Labor Cost (USD)

Measure Developer

Measure labor cost per normalized unit. (Generally, Measure and Base Labor cost are identical, in which case they would cancel out of the incremental measure cost calculation. However, values should be documented.) Standard table format is used to include this data.

A description of the cost data is included in the [Measure Case Labor Cost](#) Characterization field.

Note that per Resolution E-5221, effective PY2024, “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.”¹⁴

Peer Review QA/QC

- Verify correct labor cost(s).
- Verify that data is rounded to the appropriate precision.
- When the normalizing unit is very small, the limit of 2 decimal places many need to be over-ridden by changing the units from “USD” to “USD/unit” in the cost table or calculation.

Measure – Material Cost (USD)

Measure Developer

Measure material cost per normalized unit. A standard table format is used to include this data.

A description of the cost data is included in the [Measure Case Material Cost](#) Characterization field.

Note that per Resolution E-5221, effective PY2024, “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.”¹⁵

Peer Review QA/QC

- Verify correct material cost(s).
- Verify that data is rounded to the appropriate precision.
- When the normalizing unit is very small, the limit of 2 decimal places many need to be over-ridden by changing the units from “USD” to “USD/unit” in the cost table or calculation.

¹⁴ California Public Utilities Commission (CPUC). 2022. Resolution E-5221. November 3.

¹⁵ California Public Utilities Commission (CPUC). 2022. Resolution E-5221. November 3.

Second Baseline – Labor Cost (USD)

Measure Developer

Base case labor cost per normalized unit applicable to second baseline period.

Second baseline cost is only required for the AR Measure Application Type. A standard table format is used to include this data. When no second baseline cost is required, the value mapped should be from the “Null Values” shared data table, called “Null Values: Cost”.

Cost data is described in the [Base Case Labor Cost](#) Characterization field.

Note that per Resolution E-5221, effective PY2024, “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.”¹⁶

Peer Review QA/QC

- Verify correct labor cost(s).
- Verify that data is rounded to the appropriate precision.
- When the normalizing unit is very small, the limit of 2 decimal places may need to be over-ridden by changing the units from “USD” to “USD/unit” in the cost table or calculation.

Second Baseline – Material Cost (USD)

Measure Developer

Base case material cost per normalized unit applicable to second baseline period.

Second baseline cost is only required for the AR Measure Application Type. A standard table format is used to include this data. When no second baseline cost is required, the value mapped should be from the “Null Values” shared data table, called “Null Values: Cost”.

Cost data and methodology are described in [Base Case Material Cost](#) Characterization field.

Note that per Resolution E-5221, effective PY2024, “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.”¹⁷

Peer Review QA/QC

- Verify correct material cost.
- Verify that data is rounded to the appropriate precision.
- When the normalizing unit is very small, the limit of 2 decimal places may need to be over-ridden by changing the units from “USD” to “USD/unit” in the cost table or calculation.

¹⁶ California Public Utilities Commission (CPUC). 2022. Resolution E-5221. November 3.

¹⁷ California Public Utilities Commission (CPUC). 2022. Resolution E-5221. November 3.

Measure Total Cost 2nd Baseline (USD)

Measure Developer

Calculated value of incremental cost per normalized unit (measure cost - 2nd base case cost).

This data field is populated with a calculated value. The value should equal "0" for measure without a second baseline (all measure application types, except AR). When no second baseline cost is required, the value mapped should be from the "Null Values" shared data table, called "Null Values: Cost".

Peer Review QA/QC

- Verify correct calculation of incremental cost.
- When the normalizing unit is very small, the limit of 2 decimal places may need to be over-ridden by changing the units from "USD" to "USD/unit" in the cost table or calculation.

Locational Cost Adjustment ID

Measure Developer

Identifies the locational cost adjustment by category. If combined with a Climate Zone value, this ID will separately specify adjustments to material and labor. eTRM costs currently do not use this field. If this field is not applicable, "None" should be entered.

eTRM does not currently utilize this field.

Peer Review QA/QC

None.

eTRM does not currently utilize this field.

Life Cycle

Effective Useful Life ID

Measure Developer

The EUL describes an estimate of the median number of years that the measures installed under the program are still in place and operable.

This field specifies the identifier that maps to the appropriate effective useful life (EUL) value of the measure.

EUL ID can vary by measure specific parameters (e.g., fuel type, Use Category, and Technology Type). See the description column of the Effective Useful Life ID parameter.

Peer Review QA/QC

- Verify the proper EUL ID has been specified
- Verify that the Start and Expire Dates are applicable for this measure. This information can be verified when the latest version of the Shared Value table is imported into the measure.

EUL Years (yr)

Measure Developer

Measure life, in years, applicable to first baseline period.

For the AR, NR, NC, BRO, and BW Measure Application Types the value is equal to the EUL value.

For the AOE Measure Application Type the value should equal to the First Baseline – Life Cycle

Note that this is the field reported within the CET input file (EUL_Yrs).

Peer Review QA/QC

- Verify correct measure life is assigned to the measure

Remaining Useful Life ID

Measure Developer

Remaining useful life (RUL) is an estimate of the median number of years that a measure being replaced under the program would remain in place and operable if the program intervention had not caused the replacement.

This field specifies the identifier that maps to the appropriate RUL of the energy efficiency measure. This field will be used to calculate the life in years that can be claimed so that the calculation is transparent to a user.

For an AR Measure Application Type, the RUL ID refers to the measure equipment.

For the AOE Measure Application Type, the RUL ID typically refers to the host equipment unless the measure is not typically replaced or removed from service at the same time as the host equipment.

For other Measure Application Types (NR, NC, BW, and BRO), the field should be left blank (i.e., use the “Null Values” shared data table with the “Null Values: Blank” option) because the RUL is not applicable.

If the measure includes NR, NC, AR, and AOE Measure Application Types, create a Host EUL ID value table and enter the correct ID for each MAT (Host EUL ID for AOE, RUL ID for AR, and blank for NC and NR).

For example, see SWPR007-01 Host EUL ID value table. The “ID” column can then be mapped to the appropriate field.

Host EUL ID

[VIEW TABLE FULLSCREEN](#)

MEASURE APPLICATION TYPE	ID
AOE	PrcHt-StmBlr
NC	

If appropriate RUL ID does not exist for the measure, research and recommend an appropriate value. Include documentation and rationale for selection in the [Life Cycle](#) Characterization field.

Peer Review QA/QC

- Verify the proper RUL ID has been specified.
- If a new RUL is proposed, review data and recommended value. New values will not be available from the Shared Data tables until the new ID is approved by the CPUC.
- Verify that the Start and Expire Dates are applicable for this measure. This information can be verified when the latest version of the Shared Value table is imported into the measure.

RUL Years (yr)

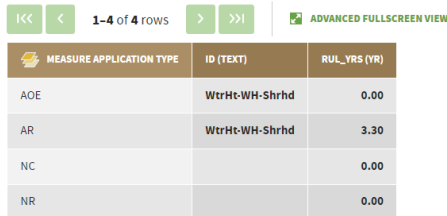
Measure Developer

Measure life, in years, applicable to the second baseline period.

For AR Measure Application Type, the value is equal to the RUL value taken from the appropriate Shared Value table. For all other Measure Application Types, this value is zero.

If the measure includes both AR and any other Measure Application Types, create a Host EUL ID value table and enter the correct RUL Yrs for each MAT (RUL Yrs for AR and 0 for everything else).

Host EUL ID



MEASURE APPLICATION TYPE	ID (TEXT)	RUL_YRS (YR)
AOE	WtrHt-WH-Shrhd	0.00
AR	WtrHt-WH-Shrhd	3.30
NC		0.00
NR		0.00

Note that this is the field reported within the CET input file (RUL_Yrs).

Peer Review QA/QC

- Verify correct measure life is assigned to the measure

First Baseline – Life Cycle (yr)

Measure Developer

Measure life, in years, applicable to first baseline period.

For NR, NC, BRO, and BW Measure Application Types the value is equal to the EUL value.

For AR Measure Application Type the value is equal to the RUL value.

For AOE Measure Application Type the value should either: 1) be calculated as the minimum of the RUL of the Host equipment and the EUL of the Measure equipment OR 2) for special cases, equal to the full EUL of the measure equipment. *For example, see SWCR005-03 Auto Closer for Refrigerated Storage Door for case #1 and SWWH002-03 Low-Flow Showerhead, Residential for case #2*

In special cases, such as lighting and some HVAC measures, the baseline life is dependent upon the annual hours of use that is linked to the Building Type. For these cases, calculated approaches are required.

Measure life source and estimation approach is included in the [Life Cycle](#) Characterization field.

Peer Review QA/QC

- Verify correct measure life is assigned to the measure

Second Baseline – Life Cycle (yr)

Measure Developer

Measure life, in years, applicable to the measure. For application types that include a RUL in the first baseline period, the second baseline period is defined by the difference in these terms (EUL-RUL).

Measure life source and estimation approach is included in the [Life Cycle](#) Characterization field.

This field is only valid for the AR Measure Application Type and is mapped to a calculation (i.e., Second Baseline Life). The value should equal "0" for measures without a second baseline (NR, AOE, NC, BRO, and BW).

For example, see SWHC047-01 Calculation tab. Use the "Null Values" shared data table with the "Null Values: Useful Life" option.

Peer Review QA/QC

- Verify correct measure life is assigned to the measure.

Energy Use

First Baseline – UEC kW (kW)

Measure Developer

This field includes the calculated peak demand value per normalized unit during first baseline period. The calculation of this value should conform to the California peak demand period definition.

If only whole-building data is available, effort should be made to isolate the usage associated with the specific measure. If this is not possible, UECkWbase1 should equal UnitkW1stBaseline (in other words, the base case usage should be set equal to the demand reduction).

Rules for storing, displaying, and downloading this data match the rules for the First Baseline – Peak Electric Demand Reduction.

This data field is populated with a calculated value or mapped from a value table. Naming conventions exist for various measure end-uses.

Peer Review QA/QC

- Validate the UEC calculation is correct, and the calculation or table is mapped correctly.
- Ensure units are consistent with normalized unit.

First Baseline – UEC kWh (kWh/yr)

Measure Developer

This field includes the calculated UEC of annual electric energy usage per normalized unit during first baseline period.

If only whole-building data is available, effort should be made to isolate the usage associated with the specific measure. If this is not possible, UECkWhbase1 should equal UnitkWh1stBaseline (in other words, the base case usage should be set equal to the savings).

This data field is populated with a calculated value or mapped from a value table. Naming conventions exist for various measure end-uses.

Rules for storing, displaying, and downloading this data match the rules for the First Baseline – Electric Savings.

Peer Review QA/QC

- Validate the UEC calculation is correct, and the calculation or table is mapped correctly.
- Ensure units are consistent with normalized unit.

First Baseline – UEC therm (therms/yr)

Measure Developer

This field includes the calculated UEC of annual gas usage per normalized unit during first baseline period.

If only whole-building data is available, effort should be made to isolate the usage associated with the specific measure. If this is not possible, UECthermbase1 should equal Unittherm1stBaseline (in other words, the base case usage should be set equal to the savings).

This data field is populated with a calculated value or mapped from a value table. Naming conventions exist for various measure end-uses.

Rules for storing, displaying, and downloading this data match the rules for the First Baseline – Gas Savings.

Peer Review QA/QC

- Validate the UEC calculation is correct, and the calculation or table is mapped correctly.
- Ensure units are consistent with normalized unit.

Second Baseline – UEC kW (kW)

Measure Developer

The second baseline is only applicable to AR Measure Application Types. In all other case, the “Null Values” shared data table should be used with the “Null Values: Energy Rate” option.

This field includes the calculated peak demand value per normalized unit during second baseline period. The calculation of this value should conform to the California peak demand definition.

If only whole-building data is available, effort should be made to isolate the usage associated with the specific measure. If this is not possible, UECkWbase2 should equal UnitkW2ndBaseline (in other words, the base case usage should be set equal to the demand reduction).

Rules for storing, displaying, and downloading this data match the rules for the First Baseline – Peak Electric Demand Reduction.

This data field is populated with a calculated value.

Peer Review QA/QC

- Validate the UEC calculation is correct, and the calculation or table is mapped correctly.
- Ensure units are consistent with normalized unit.
- If no second baseline confirm value is “0”.

Second Baseline – UEC kWh (kWh/yr)

Measure Developer

The second baseline is only applicable to the AR Measure Application Type. In all other case, the “Null Values” shared data table should be used with the “Null Values: Energy-Electric” option.

This field includes the calculated annual electric UEC per normalized unit during second baseline period.

If only whole-building data is available, efforts should be made to isolate the usage associated with the specific measure. If this is not possible, UECkWhbase2 should equal UnitkWh2ndBaseline (in other words, the base case usage should be set equal to the savings).

This data field is populated with a calculated value or mapped from a value table. Naming conventions exist for various measure end-uses.

Rules for storing, displaying, and downloading this data match the rules for the First Baseline – Electric Savings.

Peer Review QA/QC

- Validate the UEC calculation is correct, and the calculation or table is mapped correctly.
- Ensure units are consistent with normalized unit.
- If no second baseline confirm value is “0”.

Second Baseline – UEC therm (therms/yr)

Measure Developer

The second baseline is only applicable to the AR Measure Application Type. In all other case, the “Null Values” shared data table should be used with the “Null Values: Energy-Gas” option.

This field includes the calculated annual gas UEC per normalized unit during second baseline period.

If only whole-building data is available, efforts should be made to isolate the usage associated with the specific measure. If this is not possible, UECthermbase2 should equal Unitherm1ndBaseline (in other words, the base case usage should be set equal to the savings).

This data field is populated with a calculated value or mapped from a value table. Naming conventions exist for various measure end-uses.

Rules for storing, displaying, and downloading this data match the rules for the First Baseline – Gas Savings.

Peer Review QA/QC

- Validate the UEC calculation is correct, and the calculation or table is mapped correctly.
- Ensure units are consistent with normalized unit.
- If no second baseline confirm value is “0”.

Measure UEC kW (kW)

Measure Developer

This field includes the calculated peak demand value per normalized unit during measure case period. The calculation of this value should conform to the California peak demand definition.

If only whole-building data is available, effort should be made to isolate the UEC associated with the specific measure. If this is not possible, the value of UECKWmeas should equal "0".

This data field is populated with a calculated value or mapped from a value table. Naming conventions exist for various measure end-uses.

Rules for storing, displaying, and downloading this data match the rules for the First Baseline – Peak Electric Demand Reduction.

Peer Review QA/QC

- Validate the UEC demand calculation is correct and correct values are aligned in the correction permutation.

Measure UEC kWh (kWh/yr)

Measure Developer

This field includes the calculated UEC of annual electric energy usage per normalized unit.

If only whole-building data is available, efforts should be made to isolate the UEC associated with the specific measure. If this is not possible, the value of UECKWhmeas should equal "0".

This data field is populated with a calculated value or mapped from a value table. Naming conventions exist for various measure end-uses.

Rules for storing, displaying, and downloading this data match the rules for the First Baseline – Electric Savings.

Peer Review QA/QC

- Validate the UEC calculation is correct and correct values are aligned in the correction permutation.

Measure UEC therm (therm/yr)

Measure Developer

This field includes the UEC of annual gas energy usage per normalized unit.

If only whole-building data is available, efforts should be made to isolate the UEC associated with the specific measure. If this is not possible, the value of UECthermmeas should equal "0".

This data field is populated with a calculated value or mapped from a value table. Naming conventions exist for various measure end-uses.

Rules for storing, displaying, and downloading this data match the rules for the First Baseline – Gas Savings.

Peer Review QA/QC

- Validate the UEC calculation is correct and correct values are aligned in the correction permutation.

Implementation Parameters

Delivery Type

Measure Developer

Delivery Type refers to the market channel to which program services are targeted (also referred to as the “delivery channel”).

Delivery type must be allowed for the measure application type.

MeasureApplicationType-DeliveryType Exclusion table

Measure Application Type	Delivery Type
AR	DnDeemDI, DnDeemed
All MATs except AR	DnDeemDI, DnDeemed, UpDeemed

Peer Review QA/QC

- Verify correct Delivery Type(s) is(are) specified.
- Verify that UpDeemed is not available for AR

Net to Gross Ratio ID

Measure Developer

The net-to-gross (NTG) ratio is the ratio of net program impacts to gross or total impacts. The NTG ratio represents the extent of free-ridership, or the portion of energy or demand impacts that would have occurred in the absence of the program. The NTG ratio typically varies by Sector but can also vary by other parameters like Delivery Type.

There are three NTG shared value tables in eTRM to streamline the importing of the table (with references attached) and to refine the information displayed to the users. The table below shows which table should be imported for each NTG IDs.

NTG ID	NTG Table
Res-Default>2	Net to Gross Ratio - Residential
Agric-Default>2yrs	Net to Gross Ratio - Nonresidential
Com-Default>2yrs	Net to Gross Ratio - Nonresidential
Ind-Default>2yrs	Net to Gross Ratio - Nonresidential
All Other IDs	Net to Gross Ratio

Importing the “Net to Gross Ratio” shared value table will additionally add the “NTG-Version” parameter. Some NTG IDs may have multiple versions available; select the most-updated NTG version that is consistent with the measure version (ex. a 2023 measure should use the 2023 value of the NTG ID)

If the measure requires multiple NTG tables (e.g., Res and NonRes), import those tables and use a calculation to pull in the correct ratio for each NTG ID. Map this field to the calculation. Remove invalid labels from each NTG table (i.e., “Res-Default>2” label from “Net to Gross Ratio – Nonresidential” table).

Peer Review QA/QC

- Verify correct NTG ID(s) is(are) specified.
- The description field can be helpful to understand when a NTG ID should or should not be used.
- Verify that both the NTG Parameter List and Value Table have been imported to the measure.
- Verify that the chosen NTG ID has associated values and that the NTG value is most up-to-date for the measure program year (i.e. Start Date and Expire Date are consistent with the measure Start and End Date).

For example, see SWLG009-01 Supporting Data and Calculation tab.

Net to Gross Ratio – kWh in ratio

NET TO GROSS RATIO ID	VALIDITY	EQUATION (RATIO)
Agric-Default>2yrs	✓	<i>netToGrossRatioNonresidential__nTGRkWh</i>
Com-Default>2yrs	✓	<i>netToGrossRatioNonresidential__nTGRkWh</i>
Ind-Default>2yrs	✓	<i>netToGrossRatioNonresidential__nTGRkWh</i>
Res-Default>2	✓	<i>netToGrossRatioResidential__nTGRkWh</i>

The first phrase of each NTG ID indicates the Sector for which the ID is valid (ex. Com-Default>2yrs is valid for Com)

The Sector indicated by the NTG ID must be consistent with the measure Sector. See SWLG009-01 “Sector – NTG” exclusion table.

Sector-NetToGrossID Exclusion Table

NTG ID	Sector
Agric- (Agric-Default>2yrs)	Ag
Com- (Com-Default>2yrs) K-12School-ComCollege	Com
Ind- (Ind-Default>2yrs)	Ind
Res- (Res-sAll-mCFL) EUC-Default	Res
NonRes-sAll- (NonRes-sAll-mHVAC-Chiller) NonRes- (NonRes-HVAC-maint)	Com, Ind, Ag
NonRes-sGHS- (NonRes-sGHS-mIRF-ci)	Ag Sector – Greenhouse building type.
Not specify (ET-Default or All-Ltg- ScrwnLED)	Any

The description column in the shared NTG ID parameter list has further restrictions for the IDs (e.g., Delivery Type, Building Type, fuel type, etc.).

This field specifies the identifier that maps to the value of the NTG ratio in the Net to Gross Ratio shared value table that is associated with the measure.

NTGR kWh (ratio)

Measure Developer

This field contains the lookup value from Net to Gross Ratio shared value table associated with the Net to Gross Ratio ID that will be applied directly to the gross kWh savings value.

This value is provided with the Net to Gross Ratio ID. The value to map is NTGR kWh (ratio).

Peer Review QA/QC

None.

NTGR kW (ratio)

Measure Developer

This field contains the lookup value from Net to Gross Ratio shared table associated with the Net to Gross Ratio ID that will be applied directly to the gross kW reduction value.

This value is typically defined as the NTGR kWh (ratio).

Peer Review QA/QC

None.

NTGR Therms (ratio)

Measure Developer

This field contains the lookup value from Net to Gross Ratio shared table associated with the Net to Gross Ratio ID that will be applied directly to the gross therms savings value.

This value is provided with the Net to Gross Ratio ID. The value to map is NTGR Therm (ratio).

Peer Review QA/QC

None.

NTGR Cost (ratio)

Measure Developer

This field contains the lookup value from Net to Gross Ratio shared value table associated with the Net to Gross Ratio ID that will be applied directly to the gross cost value.

This value is typically taken directly from the NTG kWh or NTG therm value depending upon whether the measure is primarily focused on electric or gas savings.

Peer Review QA/QC

None.

GSIA ID

Measure Developer

This field specifies the identifier that maps to the GSIA value for the measure.

If the default GSIA is used, map this field to the “Gross Savings Installation Adjustments – Default” value table.

For all other GSIA IDs, map the field to “Gross Savings Installation Adjustments” value table. Importing the “Gross Saving Installation Adjustment” shared value table will automatically propagate 4 additional GSIA parameters: GSIA-VERSION, GSIA-BLDG TYPE, GSIA-PA, and GSIA-VINTAGE.

The GSIA value is dependent on version, building type, vintage, and PA. The “Gross Savings Installation Adjustments” table include rows for every permutation of these 4 parameters, but each GSIA ID is only valid for certain permutations. The four GSIA parameters mimic the function of the four measure parameters (Version, Building Type, Program Administrator, and Vintage) in order for the shared GSIA value table to extract the correct GSIA value.

For example, Commercial Condenser Coil Cleaning has 19 commercial building types, “Ex” vintage, and Program Administrator = “Any”. However, the GSIA parameters for “Com-RCA-All” are “DEER2011” GSIA version, “Any” GSIA building type, “Any” GSIA

Peer Review QA/QC

- Verify correct GSIA ID(s) is(are) specified.
- The description field can be helpful in understand when a GSIA ID should or should not be used.

vintage, and “Any” GSIA PA (any other combinations will produce a blank cell). See SWSV004-01 Supporting Data tab.

GSIA ID	GSIA VERSION	GSIA-BLDG TYPE	GSIA-VINTAGE	GSIA-PA	GSIA DESCRIPTION	GSIA VALUE (RATIO)
Com-RCA-All	DEER2011	Any	Any	Any	Commercial Refrigerant Charge & Airflow Adjustment; Annual Installation Rate	0.6380

See file “Exclusion Tables Examples 2021.08.25.xlsx” attached to these Guidelines to see which GSIA parameters combination is required for each non-default GSIA ID, as well as the Sector – GSIA ID exclusion table.

GSIA Value (ratio)

Measure Developer

This field includes the lookup value associated with the [GSIA ID](#) from the GSIA shared table.

Peer Review QA/QC

None.

Restricted Permutation (number)

Measure Developer

This field was created in response to the Gas Decision - D.23-04-035 to document the TRCRatio for non-exempt natural gas, new construction, and Res or Com permutations.

Field has value of 0 if TRCRatio ≥ 1 and value of 1 if TRCRatio < 1 .

For measures/permutations that are not non-exempt gas, NC MAT, or Res/Com sector, this field has a value of 0.

Peer Review QA/QC

- Check that values are mapped from the Null Values table.

Cost Effectiveness Parameters

Electric Impact Profile ID

Measure Developer

This field specifies the identifiers of load shapes used for portfolio lifecycle cost analysis.

A load shape indicates the distribution of a measure energy savings over one year. A load shape is a set of fractions summing to unity, with one fraction per hour (or other time period). Multiplying a savings value by the load shape value for a particular hour will yield the energy savings for that hour of the year.

DEER Load shapes vary by Sector, as shown in the table below.

Sector	Electric Load Shape
Com	HVAC_Chillers HVAC_Split-Package_AC HVAC_Split-Package_HP Indoor_Non-CFL_Ltg
Res	HVAC_Eff_AC HVAC_Eff_HP Refg_Chrg_Duct_Seal RefgFrzr_HighEff RefgFrzr_Recyc-Conditioned RefgFrzr_Recycling RefgFrzr_Recyc-UnConditioned
Any	HVAC_Duct_Sealing HVAC_Refrig_Charge Indoor_CFL_Ltg DEER:Indoor_Non-CFL_Ltg Res_BldgShell_Ins Res_ClothesDishWasher

Peer Review QA/QC

- Verify proper electric impact profile ID is specified.
- Additional load shapes are being developed, but consideration should include: weather sensitive loads, night loads, etc.
- Ensure that electric load shapes align with Sector so that these will be processed correctly through the CET calculator.

Gas Impact Profile ID

Measure Developer

This field specifies the identifiers of load shapes used for portfolio lifecycle cost analysis.

A load shape indicates the distribution of a measure energy savings over one year. A load shape is a set of fractions summing to unity, with one fraction per hour (or other time period). Multiplying a savings value by the load shape value for a particular hour will yield the energy savings for that particular hour.

Peer Review QA/QC

- Verify proper gas impact profile ID is specified.

Unit Gas Infrastructure Benefits (USD)

Measure Developer

Per-unit benefits in dollars due to offsetting natural gas infrastructure costs, referred to as avoided gas infrastructure costs (AGIC), which is only applicable for new construction. AGIC values are available in a values table.

The term is included in the CPUC Cost Effectiveness Test Reference Manual and appears in the calculation for Other Benefits.

The Unit Gas Infrastructure Benefits (UnitGasInfraBens, $UB_{Meas, GasInfr}$) is a numeric field that is used to create the CET input file for the measure.

Peer Review QA/QC

- This field cannot be empty or null (instead it should be zero) and should not contain special characters such as "\$" or "," for the cost entry.
- Verify compliance with CET requirements.

Unit Refrigerant Costs (USD)

Measure Developer

Per-unit costs in dollars due to increased refrigerant use or use of refrigerant with higher global warming potential. The unit refrigerant costs are outputs of the refrigerant avoided cost calculator (RACC).

https://www.ethree.com/public_proceedings/energy-efficiency-calculator/

The term is included in the CPUC Cost Effectiveness Test Reference Manual and appears in the calculation for Other Costs.

The Unit Refrigerant Costs (UnitRefrigCosts, $UC_{Meas, Ref}$) is a numeric input field that is used to create the CET input file for the measure.

Peer Review QA/QC

- This field cannot be empty or null (instead it should be zero) and should not contain special characters such as "\$" or "," for the cost entry.
- Verify compliance with CET requirements.

Unit Refrigerant Benefits (USD)

Measure Developer

Per-unit benefits in dollars due to decreased refrigerant use or use of refrigerant with lower global warming potential. The unit refrigerant benefits are outputs of the refrigerant avoided cost calculator.

https://www.ethree.com/public_proceedings/energy-efficiency-calculator/

The term is included in the CPUC Cost Effectiveness Test Reference Manual and appears in the calculation for Other Benefits.

The Unit Refrigerant Benefits (UnitRefrigBens, $UB_{Meas, Ref}$) is a numeric input field that is used to create the CET input file for the measure.

Peer Review QA/QC

- This field cannot be empty or null (instead it should be zero) and should not contain special characters such as "\$" or "," for the cost entry.
- Verify compliance with CET requirements.

Unit Miscellaneous Costs (USD)

Measure Developer

Per-unit miscellaneous costs expressed in present-value dollars.

This field is intended for future use.

The term is included in the CPUC Cost Effectiveness Test Reference Manual and appears in the calculation for Other Costs.

The Unit Miscellaneous Costs (UnitMiscCosts, $UC_{Meas,Misc}$) is a numeric input field that is used to create the CET input file for the measure.

Peer Review QA/QC

- This field cannot be empty or null (instead it should be zero) and should not contain special characters such as "\$" or "," for the cost entry.
- Verify compliance with CET requirements.

Miscellaneous Cost Description

Measure Developer

Description of miscellaneous costs (MiscCostDesc) to provide context for the costs included.

This field is limited to 255 characters and all characters must comply with CET requirements.

Peer Review QA/QC

- The field may be left blank if the Unit Miscellaneous Cost is zero.
- Verify compliance with CET requirements.

Unit Miscellaneous Benefits (USD)

Measure Developer

Per-Unit miscellaneous benefits expressed in present-value dollars.

This field is intended for future use.

The term is included in the CPUC Cost Effectiveness Test Reference Manual and appears in the calculation for Other Benefits.

The Unit Miscellaneous Benefits (UnitMiscBens, $UB_{Meas,Misc}$) is a numeric input field that is used to create the CET input file for the measure.

Peer Review QA/QC

- This field cannot be empty or null (instead it should be zero) and should not contain special characters such as "\$" or "," for the cost entry.
- Verify compliance with CET requirements.

Miscellaneous Benefits Description

Measure Developer

Description of miscellaneous benefits (MiscBensDesc) to provide context for the costs included.

This field is limited to 255 characters and all characters must comply with CET requirements.

Peer Review QA/QC

- The field may be left blank if the Unit Miscellaneous Cost is zero. Verify compliance with CET requirements.

Market Effects Benefits

Measure Developer

The default market effects value is 0% in the CET tool.

The value in this field is expressed as a decimal that represents a whole percentage. For example, 5% should be entered as 0.05; 0.055 is not valid. If no specific value is applicable, this field should be left blank because any value entered will over-ride the portfolio level value.

If the value is left blank, map the “Null Values” shared data table with the “Null Values: Blank” option.

Peer Review QA/QC

- If this field is blank, verify the default value (0%) is desired.
- If a specific value different from the default is applicable, verify the value meets the guideline.

Market Effects Costs

Measure Developer

The default market effects value is 0% in the CET tool.

The value in this field is expressed as a decimal that represents a whole percentage. For example, 5% should be entered as 0.05; 0.055 is not valid. If no specific value is applicable, this field should be left blank because any value entered will over-ride the portfolio level value.

If the value is left blank, map the “Null Values” shared data table with the “Null Values: Blank” option.

Peer Review QA/QC

- If this field is blank, verify the default value (0%) is desired.
- If a specific value different from the default is applicable, verify the value meets the guideline.

Measure Inflation

Measure Developer

This optional CET field defines the measure inflation percentage. The value should be expressed as a decimal that represents a whole percentage. For example, 2% should be entered as 0.02; 0.025 is not valid.

If the value is left blank, map the “Null Values” shared data table with the “Null Values: Blank” option.

Peer Review QA/QC

- This is an optional field. If it is used, verify the value is in the appropriate format.

Combustion Type

Measure Developer

This optional CET field defines the combustion type used:

Large Boilers (>100 MMBtu/hr Heat Input):Uncontrolled

Large Boilers (>100 MMBtu/hr Heat Input):Controlled Low NOx Burner

Large Boilers (>100 MMBtu/hr Heat Input):Controlled – Flue Gas Recirculation

Small Boilers (<100 MMBtu/hr Heat Input):Uncontrolled

Small Boilers (<100 MMBtu/hr Heat Input):Controlled Low NOx Burner

Small Boilers (<100 MMBtu/hr Heat Input):Controlled – Flue Gas Recirculation

Residential Furnaces (<0.3):Uncontrolled

If this field is not applicable, "NA" should be entered. Map the "Null Values" shared data table with the "Null Values: Not Applicable" option.

Peer Review QA/QC

- This is an optional CET field. If used, verify the value is in the appropriate format.
- If it is not applicable, verify 'NA'.

Measure Impact Calculation Type

Measure Developer

Defines the calculation methodology used to quantify measure savings. Five valid options are available, but almost all values are "Standard":

Cross-Measure Weighted (CrossMeasWtd): Energy impacts for multiple measures are weighted to create a new set of measure impacts.

Direct Impacts (DirectIE): Energy impacts are specified with "Direct Impacts" and modified by Interactive-Effects tables.

Scaled (Scaled): Whole-building energy impacts are specified by a reference to a "Scalable" Energy Impact ID along with a Scale Value.

Scaled Direct Impacts (ScaledDirectIE): End-Use energy impacts are specified by a reference to a "Scalable" Energy Impact ID along with a Scale Value, Whole-building impacts are determined by applying a specified interactive effects table to the end-use impacts.

Standard (Standard): Energy impacts are looked up in the Energy Impact table based on a specified EnergyImpactID.

Peer Review QA/QC

- Verify that proper "Measure Impact Calculation Type" has been specified based on the descriptions for the five options available.


Upstream Flag (True/False)

Measure Developer

Calculated field based upon the Delivery Type. If Delivery Type is "UpDeemed", map the field to the "Null Values" shared data table with the "Null Values: True" option; otherwise, map to "Null Values: False". If a measure has UpDeemed with DnDeemed and/or DnDeemDI, create an Upstream Flag value table, write in the corresponding Upstream Flag for each Delivery Type, and map this table.

For example, see SWHC020-01 Supporting Data tab.

Upstream Flag

 DELIVERY TYPE	VALUE
DnDeemDI	False
DnDeemed	False
UpDeemed	True

Peer Review QA/QC

None

Version

Measure Developer

This field designates the version of the energy impacts based on CPUC policy.

Version is a concatenation of the measure source (DEER or ExAnte = non-DEER) and the effective year. The source must match the measure impact type according to the following exclusion table. See SWAP006-01 Supporting Data tab.

Version-MeasureImpactType Exclusion Table

Version	Measure Impact Type
DEERxxxx	Deem-DEER
ExAntexxxx	Deem-WP

The Deem-DEER combination is only used if it is a DEER measure, and the savings are taken directly from the DEER database *without* any modification.

All other deemed measures assume the Deem-WP combination.

Peer Review QA/QC

Verify correct version is specified.

Version Source

Measure Developer

The Version Source field is used to further define energy impacts beyond the Version field. Version Source ID populates this field.

When the measure is a DEER measure, this field will be populated with the version that corresponds to the energy impacts, not the measure data.

When the measure is not a DEER measure or the measure is included in the DEER Water Heater Calculator, this field will be populated with either "IOU Workpaper" or the appropriate version from the DEER Water Heater Calculator. If the version is coming from the DEER Water Heater Calculator, this field will be populated with the version that corresponds to the energy impacts, not the measure data.

Peer Review QA/QC

- Verify correct version is specified.
- When a DEER measure, verify that this version corresponds to the energy impacts as opposed to the measure data. The measure and energy impact values can sometimes be different.
- When not a DEER measure or the measure is included in the DEER Water Heater Calculator, verify that this version is either "IOU Workpaper" or the version from the DEER Water Heater Calculator that corresponds to the impacts as opposed to the measure data. The DEER Water Heater Calculator measure and energy impact values can sometimes be different.

Cost Effectiveness Outputs

Electric Benefits (USD)

Measure Developer

This field represents Net Electric Benefits. Gross Electric Benefits include avoided costs associated both with generation and with transmission and distribution; thus, this value represents the summation over the life of the measure of the product of avoided costs and electric savings. The calculation for Net Electric Benefits is described in the CPUC Cost Effectiveness Test Reference Manual.

This field is imported into the measure permutation table via the "Upload CET Output File" feature in eTRM. The value is never entered directly by the measure developer.

Peer Review QA/QC

- Confirm, before running the CET, that the CET input files, measure.csv and programCost.csv, have the correct Claim Year/Quarter and PrgYear. These fields should match the start date of the measure and Q3.
- Confirm, before running the CET, that the First Year field matches the year of the start date of the measure.
- Confirm that the CET analysis was completed without error or warnings.

Gas Benefits (USD)

Measure Developer

This field represents Net Gas Benefits. Gross Gas Benefits include avoided costs associated with natural gas consumption; thus, this value represents the summation over the life of the measure of the product of avoided cost and gas savings. The calculation for Net Gas Benefits is described in the CPUC Cost Effectiveness Test Reference Manual.

Gas Benefits is imported into the measure permutation table via the "Upload CET Output File" feature of eTRM. The value is never entered directly by the measure developer.

Peer Review QA/QC

- Confirm, before running the CET, that the CET input files, measure.csv and programCost.csv, have the correct Claim Year/Quarter and PrgYear. These fields should match the start date of the measure.
- Confirm, before running the CET, that the First Year field matches the year of the start date of the measure.
- Confirm that the CET analysis was completed without error or warnings.

TRC Cost - No Administrative Cost (USD)

Measure Developer

This field represents the Net Total Resource Cost without Administrator Cost, which is calculated identically as the Net TRC Cost with Administrator Cost but without including program-level costs. This calculation is described in the CPUC Cost Effectiveness Test Reference Manual and includes costs for the measure, participants, electric and gas benefits, as well as refrigerant and miscellaneous costs.

The "no administrative cost" version is included in the eTRM to provide a directional and best-case view of a permutation cost effectiveness without the consideration for the needs of a specific program.

This field is imported into the measure permutation table via the "Upload CET Output File" feature. The value is never entered directly by the measure developer.

Peer Review QA/QC

- Confirm, before running the CET, that the CET input files, measure.csv and programCost.csv, have the correct Claim Year/Quarter and PrgYear. These fields should match the start date of the measure.
- Confirm, before running the CET, that the First Year field matches the year of the start date of the measure.
- Confirm that the CET analysis was completed without error or warnings.

PAC Cost - No Administrative Cost (USD)

Measure Developer

This field represents the Net Program Administrator Cost without Administrator Cost. The field is calculated identically as the TRC Cost – No Administrator Cost but without including participant cost. This calculation is described in the CPUC Cost Effectiveness Test Reference Manual and includes costs for the measure, electric and gas benefits, as well as refrigerant and miscellaneous costs.

The “no administrative cost” version is included in the eTRM to provide a directional and best-case view of permutation cost effectiveness without the consideration for the needs of a specific program.

This field is imported into the measure permutation table via the “Upload CET Output File” feature. The value is never entered directly by the measure developer.

Peer Review QA/QC

- Confirm, before running the CET, that the CET input files, measure.csv and programCost.csv, have the correct Claim Year/Quarter and PrgYear. These fields should match the start date of the measure.
- Confirm, before running the CET, that the First Year field matches the year of the start date of the measure.
- Confirm that the CET analysis was completed without error or warnings.

TRC Ratio - No Administrative Cost

Measure Developer

Cost effectiveness tests are defined in the California Standard Practice Manual and updates have been made in CPUC decisions. Total Resource Cost (TRC) Ratio is a ratio of benefits / cost. The Total Resource Cost Ratio considers both net costs and net benefits from both the program administrator and customer perspective. This calculation is described in the CPUC Cost Effectiveness Test Reference Manual.

The “no administrative cost” version is included in the eTRM to provide a directional and best-case view of permutation cost effectiveness without the consideration for the needs of a specific program.

This field is imported into the measure permutation table via the “Upload CET Output File” feature. The value is never entered directly by the measure developer.

Peer Review QA/QC

- Confirm, before running the CET, that the CET input files, measure.csv and programCost.csv, have the correct Claim Year/Quarter and PrgYear. These fields should match the start date of the measure.
- Confirm, before running the CET, that the First Year field matches the year of the start date of the measure.
- Confirm that the CET analysis was completed without error or warnings.

PAC Ratio - No Administrative Cost

Measure Developer

Cost effectiveness tests are defined in the *California Standard Practice Manual* and updates have been made in CPUC decisions. The Program Administrator Cost (PAC) test considers net costs from just the program administrator perspectives, while the net benefits are the same as the TRC test. This calculation is described in the CPUC Cost Effectiveness Test Reference Manual.

The “no administrative cost” version is included in the eTRM to provide a directional and best-case view of permutation cost effectiveness without the consideration for the needs of a specific program.

This field is imported into the measure permutation table via the “Upload CET Output File” feature. The value is never entered directly by the measure developer.

Peer Review QA/QC

- Confirm, before running the CET, that the CET input files, `measure.csv` and `programCost.csv`, have the correct Claim Year/Quarter and PrgYear. These fields should match the start date of the measure.
- Confirm, before running the CET, that the First Year field matches the year of the start date of the measure.
- Confirm that the CET analysis was completed without error or warnings.

Total System Benefit (USD)

Measure Developer

This field represents the Net Total System Benefits (TSB). TSB is defined as the sum of all net energy benefits less the sum of all net additional supply costs. These terms include electric, gas, and refrigerant benefits and costs. The gas infrastructure and the other benefits and costs are excluded from the TSB. This calculation is described in the CPUC Cost Effectiveness Test Reference Manual.

This field is imported into the measure permutation table via the “Upload CET Output File” feature. The value is never entered directly by the measure developer.

Peer Review QA/QC

- Confirm, before running the CET, that the CET input files, `measure.csv` and `programCost.csv`, have the correct Claim Year/Quarter and PrgYear. These fields should match the start date of the measure.
- Confirm, before running the CET, that the First Year field matches the year of the start date of the measure.
- Confirm that the CET analysis was completed without error or warnings.

Water Energy Benefits (USD)

Measure Developer

This field represents the Net Water Energy Benefits. Water Energy Benefits is defined as the net electric benefits attributable to water energy savings.

This field is imported into the measure permutation table via the “Upload CET Output File” feature. The value is never entered directly by the measure developer.

Peer Review QA/QC

- Confirm, before running the CET, that the CET input files, `measure.csv` and `programCost.csv`, have the correct Claim Year/Quarter and PrgYear. These fields should match the start date of the measure.
- Confirm, before running the CET, that the First Year field matches the year of the start date of the measure.
- Confirm that the CET analysis was completed without error or warnings.

Other Benefits (USD)

Measure Developer

This field represents the Net Other Benefits. This term includes the Avoided Gas Infrastructure Cost (AGIC) and refrigerant and miscellaneous benefits. This calculation is described in the CPUC Cost Effectiveness Test Reference Manual.

This field is imported into the measure permutation table via the "Upload CET Output File" feature. The value is never entered directly by the measure developer.

Peer Review QA/QC

- Confirm, before running the CET, that the CET input files, measure.csv and programCost.csv, have the correct Claim Year/Quarter and PrgYear. These fields should match the start date of the measure.
- Confirm, before running the CET, that the First Year field matches the year of the start date of the measure.
- Confirm that the CET analysis was completed without error or warnings.

Other Costs (USD)

Measure Developer

This field represents the Net Other Costs. This term includes the refrigerant and miscellaneous costs. This calculation is described in the CPUC Cost Effectiveness Test Reference Manual.

This field is imported into the measure permutation table via the "Upload CET Output File" feature. The value is never entered directly by the measure developer.

Peer Review QA/QC

- Confirm, before running the CET, that the CET input files, measure.csv and programCost.csv, have the correct Claim Year/Quarter and PrgYear. These fields should match the start date of the measure.
- Confirm, before running the CET, that the First Year field matches the year of the start date of the measure.
- Confirm that the CET analysis was completed without error or warnings.

Water Savings

Water Measure Type

Measure Developer

This field specifies whether a water savings measure is:

- Outdoor – Embedded water energy usage includes energy required for extraction, conveyance, treatment and distribution.
- Indoor – Includes the same sources as Outdoor, but also captures includes the collection and treatment of wastewater.

If no water savings exist for this measure, map the field to the “Null Values” shared data table with the “Null Values: Blank” option.

Peer Review QA/QC

- Verify correct Water Measure Type is(are) specified.
- If it is not applicable, verify ‘Blank’.

First Baseline – Water Savings

Measure Developer

Annual water savings (gal/yr) associated with the measure (if applicable) during the first baseline period. For projects that also save water, the Water Energy Calculator must be used to determine the embedded energy savings.

The value should be expressed as a whole number per normalized unit. If no water savings exist for this measure, map the field to the “Null Values” shared data table with the “Null Values: Water Volume” option.

This data field is populated with a calculated value.

Peer Review QA/QC

- Methodology confirmed in QA/QC of the Non-Energy Impacts Characterization field.
- Validate the water savings calculation is correct and confirm correct values are aligned in the correction permutation.
- If it is not applicable, verify ‘0 Gal’.

Second Baseline – Water Savings

Measure Developer

Annual water savings (gal/yr) associated with the measure (if applicable) during the second baseline period. For projects that also save water, the Water Energy Calculator must be used to determine the embedded energy savings.

The value should be expressed as a whole number per normalized unit. If no water savings exist for this measure, map the field to the “Null Values” shared data table with the “Null Values: Water Volume” option.

This data field is populated with a calculated value.

The value should equal "0" for measure without a second baseline (all Measure Application Types, except AR). The value mapped should be from the “Null Values” shared data table, called “Null Values: Water Volume”.

Peer Review QA/QC

- Methodology confirmed in QA/QC of the Non-Energy Impacts Characterization field.
- Validate the water savings calculation is correct and confirm correct values are aligned in the correction permutation.
- If it is not applicable, verify ‘0 Gal’.

First Baseline – IOU Embedded Water Energy Savings

Measure Developer

Annual IOU embedded water energy savings (kWh/yr) associated with the measure (if applicable) during the first baseline period. The total IOU embedded water energy intensity ratio from the Water Energy Calculator must be used to determine the IOU embedded energy savings.

The value should be expressed as a whole number per normalized unit. If no water savings exist for this measure, map the field to the “Null Values” shared data table with the “Null Values: Energy-Electric” option.

This data field is populated with a calculated value.

Peer Review QA/QC

- Methodology confirmed in QA/QC of the Electric Savings Characterization field.
- Validate the IOU embedded water energy savings calculation is correct and confirm correct values are aligned in the correction permutation.
- If it is not applicable, verify '0 kWh'.

Second Baseline – IOU Embedded Water Energy Savings

Measure Developer

Annual IOU embedded water energy savings (kWh/yr) associated with the measure (if applicable) during the second baseline period. The total IOU embedded water energy intensity ratio from the Water Energy Calculator must be used to determine the IOU embedded energy savings.

The value should be expressed as a whole number per normalized unit. If no water savings exist for this measure, map the field to the “Null Values” shared data table with the “Null Values: Energy-Electric” option.

This data field is populated with a calculated value.

The value should equal "0" for measure without a second baseline (all Measure Application Types, except AR). The value mapped should be from the “Null Values” shared data table, called “Null Values: Energy-Electric”.

Peer Review QA/QC

- Methodology confirmed in QA/QC of the Electric Savings Characterization field.
- Validate the IOU embedded water energy savings calculation is correct and confirm correct values are aligned in the correction permutation.
- If it is not applicable, verify '0 kWh'.

First Baseline – Total Embedded Water Energy Savings

Measure Developer

Annual total embedded water energy savings (kWh/yr) associated with the measure (if applicable) during the first baseline period. The IOU embedded water energy savings and the non-IOU embedded water energy savings must be used to determine the total embedded energy water savings. The total non-IOU embedded water energy intensity ratio from the Water Energy Calculator must be used to determine the non-IOU embedded energy savings.

The value should be expressed as a whole number per normalized unit. If water savings are not known, map the field to the “Null Values” shared data table with the “Null Values: Energy-Electric” option.

This data field is populated with a calculated value.

Peer Review QA/QC

- Methodology confirmed in QA/QC of the Electric Savings Characterization field.
- Validate the total IOU embedded water energy savings calculation is correct and confirm correct values are aligned in the correction permutation.
- If it is not applicable, verify '0 kWh'.

Second Baseline – Total Embedded Water Energy Savings

Measure Developer

Annual total embedded water energy savings (kWh/yr) associated with the measure (if applicable) during the first baseline period. The IOU embedded water energy savings and the non-IOU embedded water energy savings must be used to determine the total embedded energy water savings. The total non-IOU embedded water energy intensity ratio from the Water Energy Calculator must be used to determine the non-IOU embedded energy savings.

The value should be expressed as a whole I number per normalized unit. If no water savings exist for this measure, map the field to the "Null Values" shared data table with the "Null Values: Energy-Electric" option.

This data field is populated with a calculated value.

The value should equal "0" for measure without a second baseline (all Measure Application Types, except AR). The value mapped should be from the "Null Values" shared data table, called "Null Values: Energy-Electric".

Peer Review QA/QC

- Methodology confirmed in QA/QC of the Electric Savings Characterization field.
- Validate the total IOU embedded water energy savings calculation is correct and confirm correct values are aligned in the correction permutation.
- If it is not applicable, verify '0 kWh'.

Other

Measure Technology ID

Measure Developer

Technology ID is a subset of Technology Type. This ID describes the measure case technology.

For DEER modeled measures, this ID provides insight into the prototype model used to estimate the energy usage of the measure case.

If measure is DEER, this field is mapped to the "Measure Technology ID" column of the shared "DEER Measure" value table. If measure is not DEER, a Technology ID should be established with the EAR Team to populate this field.

If measure has a mixture of DEER and non-DEER offerings, create a "Technology IDs" value table write in the corresponding Measure Technology ID for each offering. See SWWH025-05

Peer Review QA/QC

- Confirm correct specification and consistency with like measures.

Pre-Existing Technology ID

Measure Developer

Technology ID is a subset of Technology Type. This ID describes the pre-existing base case technology.

For DEER modeled measures, this ID provides insight into the prototype model used to estimate the energy usage of the pre-existing case. If measure is not DEER, a Technology ID should be established with the EAR Team to populate this field.

See the Measure Technology ID for the convention on how to map this field

Peer Review QA/QC

- Confirm correct specification and consistency with like measures.

Standard Technology ID

Measure Developer

Technology ID is a subset of Technology Type. This ID describes the Standard Base Case technology.

For DEER modeled measures, this ID provides insight into the prototype model used to estimate the energy usage of the standard case. If measure is not DEER, a Technology ID should be established with the EAR Team to populate this field.

See the Measure Technology ID for the convention on how to map this field

Peer Review QA/QC

- Confirm correct specification and consistency with like measures.

Technology Group

Measure Developer

Technology Group defines the highest level of measure technology categorization of the measure case. Note that technology categorization is distinguished here from usage categorization.

This field facilitates categorization of claims data but is expected to also help specify load shape data.

Peer Review QA/QC

- Confirm correct specification and consistency with like measures.

Pre-Existing Technology Group

Measure Developer

Technology Group defines the highest level of measure technology categorization of the pre-existing base case. Note that technology categorization is distinguished here from usage categorization.

This field facilitates categorization of claims data but is expected to also help specify load shape data.

Peer Review QA/QC

- Confirm correct specification and consistency with like measures.

Standard Technology Group

Measure Developer

Technology Group defines the highest level of measure technology categorization of the standard base case. Note that technology categorization is distinguished here from usage categorization.

This field facilitates categorization of claims data but is expected to also help specify load shape data.

Peer Review QA/QC

- Confirm correct specification and consistency with like measures.

Technology Type

Measure Developer

Technology Type is a subcategory to Technology Group to further characterize the measure case.

The Technology Type must be a valid subcategory choice for the chosen technology group. If multiple technology types, belonging to different technology groups, are specified, create a Technology Group – Technology Type exclusion table.

This field facilitates categorization of claims data but is expected to also help specify load shape data.

This field also defines the default normalization unit that should be used for the measure.

See file “Exclusion Tables Examples 2021.08.25.xlsx” attached to these Guidelines.

Peer Review QA/QC

- Confirm correct specification of and consistency with like measures.

Pre-Existing Technology Type

Measure Developer

Technology Type is a subcategory to Technology Group to further characterize the pre-existing base case.

The Technology Type must be a valid subcategory choice for the chosen technology group. If multiple technology types, belonging to different technology groups, are specified, create a Technology Group – Technology Type exclusion table.

This field facilitates categorization of claims data but is expected to also help specify load shape data.

This field also defines the default normalization unit that should be used for the measure.

See file “Exclusion Tables Examples 2021.08.25.xlsx” attached to these Guidelines.

Peer Review QA/QC

- Confirm correct specification of and consistency with like measures.

Standard Technology Type

Measure Developer

Technology Type is a subcategory to Technology Group to further characterize the standard base case.

The Technology Type must be a valid subcategory choice for the chosen technology group. If multiple technology types, belonging to different technology groups, are specified, create a Technology Group – Technology Type exclusion table.

This field facilitates categorization of claims data but is expected to also help specify load shape data.

This field also defines the default normalization unit that should be used for the measure.

See file “Exclusion Tables Examples 2021.08.25.xlsx” attached to these Guidelines.

Peer Review QA/QC

- Confirm correct specification of and consistency with like measures.

Use Category

Measure Developer

Select the most appropriate end-use category for the measure. When in doubt, review other measures within the category to ensure the correct fit.

Use Subcategory should be identified to align with Use Category and also with like measures. This field facilitates categorization of claims data.

For example, Food Service generally includes commercial cooking equipment, while Appliance and Plug Load includes residential cooking appliances.

Peer Review QA/QC

- Confirm correct specification and consistency with like measures.

Use Subcategory

Measure Developer

Use Subcategory is a subsidiary of Use Category to further specify the measure in terms of how the measure is used.

Similar to Technology Type, Use Subcategory must be a valid subcategory choice for the chosen use category label. If multiple use subcategories belonging to different subcategory labels are required, then create a Use Category – Use Subcategory exclusion table.

This field facilitates categorization of claims data.

Peer Review QA/QC

- Confirm correct specification and consistency with like measures.

UseCategory-UseSubcategory Exclusion Table

Use Category	Use Subcategory	Use Category	Use Subcategory
AppPlug	Electronics KitchenApp Laundry Office_eq Refrig Vending	NonSav	NonSav
BldgEnv	Fenestration Opaque	ProcDist	AirDist DairyVac Power Pumping
C&S	UnCatC&S	ProcDry	Condensing Curing EvapSepDehyd Finish
CompAir	ChemTreat Controls ManufAQA ManufDryAir MatConvPkg ToolsOp	ProcHeat	Cooking Drying EnvContols EvapSepDehyd HeatTreat LiquidDist Melting Pasteurize PreheatLiqSol Reheat SteamDist
ComRefrig	Display Equipment Storage	ProcRefrig	ProdChill ProdManuf ProdStore Separate
FoodServ	Cleaning Cooking Packaging	Recreate	Pool Spa
HVAC	EnvCtrl HeatCool HtRej SpaceCool SpaceHeat VentAirDist	Service	Audit Diagnostic Maintenance RetroComm Testing

Use Category	Use Subcategory	Use Category	Use Subcategory
Irrigate	FarmIrrig LandScape	SHW	Distribute Heating PointOfUse
Lighting	InCommon ; InExit InGen InGen-CFL InGen-HB InGen-LF InRetDisp InTask Out24hr OutCommon OutDuskDawn OutGen OutSign ParkGar RefDisplay Seasonal	WhIBldg	WBUUpgrade

Building HVAC

Measure Developer

Building HVAC system describes if the measure savings are applicable to a specific type of HVAC system. If a weighted average approach is followed, special IDs designate the weighted average residential building type (rWtd) or commercial building type (cWtd). Note that per Resolution E-5221 Attachment A, effective PY2024, the “rWtd” and “cWtd” building HVACs can be used for all delivery types except direct install.¹⁸

The first letter of each HVAC type indicates the Sector of the HVAC system.

Sector- BuildingHVAC Exclusion Table

Building HVAC	Sector
a- (ex. aGF)	Agricultural
c- (ex. cDXGF)	Commercial and Industrial
r- (ex. rDXHP)	Residential
Any	Any

Peer Review QA/QC

- Confirm if savings identified as applicable to specific HVAC system types is appropriate. If so, verify correct ID(s) is(are) specified.
- If the weighted average approach is followed, (rWtd or cWtd) confirm if appropriate. These choices are appropriate for all delivery types except direct install, effective PY2024 per Resolution E-5221.

¹⁸ California Public Utilities Commission (CPUC). 2022. Resolution E-5221: Attachment A. November 3.

ETP Flag

Measure Developer

The ETP Flag indicates measure offerings were supported by research funded through the Emerging Technologies Program (ETP). This designation could be set at any level (measure, offerings, or permutation-level) depending upon what is appropriate.

This field requires a text entry to list the ET Project Numbers that are associated with this permutation or set of permutations.

When multiple ET Projects Numbers are applicable, all values should be included and separated by commas.

If measure was not influenced by any ET project, map the field to the "Null Values" shared data table with the "Null Values: Blank" option.

Peer Review QA/QC

- Confirm that the measure / offerings align correctly with the ET Project; a reference file should be included to connect the measure to the ETP.

ETP First Year Introduced to Programs

Measure Developer

The ETP First Year Introduced to Programs field documents the year an ETP-funded technology was first approved as a deemed measure.

If measure was not influenced by any ET project, map the field to the "Null Values" shared data table with the "Null Values: Blank Date" option.

Currently, this field is not in use.

Peer Review QA/QC

- Confirm that the measure and/or measure offerings align correctly with the ET Project.

Is IE Factor Applied?

Measure Developer

This yes/no flag designates whether interactive effects are applied to the measure.

Interactive effects are defined as the secondary energy and demand impacts that result from a measure to a secondary system or equipment not directly involved in the retrofit activity (e.g., cooling or heating energy impacts resulting from the installation of efficient lighting fixtures).

If **lighting** interactive effects are applicable for the calculation, import one or both of the shared interactive effects value tables: Interactive Effects - Commercial (2020-Com-InLtg) and Interactive Effects - Residential (2020-Res-InLtg).

Similar to the GSIA value table, the shared lighting interactive effects value tables will additionally require Lighting Type, IE-Bldg Type, and IE-Version parameters, which are used to make selections from the shared interactive effects tables.

For Lighting Type, make sure the lighting type sector matches the measure sector; create the "Sector-LightingType" exclusion table if necessary. The IE-Bldg Type parameter will typically matches 1-to-1 with the measure building type; create the "BuildingType-IE-BldgType" if necessary. For the IE-Version parameter, use the latest version appropriate for the measure (ex. a 2023 measure should use 2023 IE data).

Sector-LightingType Exclusion Table

Lighting Type	Sector
Com-ILtg-HardWired	Commercial, Industrial, Agricultural
Com-ILtg-HighBay	Commercial, Industrial, Agricultural
Com-ILtg-ScrewIn	Commercial, Industrial, Agricultural
Res-Indoor-Screw	Residential
All-OLtg-dWatt	Any
All-OLtg-dWatt-MS	Any
NRes-OLtg-Gar-dWatt	Commercial
Res-ILtg-dWatt-CFL-basis	Residential

"Any" is not a valid building vintage option for the shared interactive effect tables; building vintage should be "Ex", "New", "Old", or "Rec".

For example, see SWLG009.

Peer Review QA/QC

- Verify correct designation of interactive effects.

IE Table Name

Measure Developer

This field identifies the appropriate interactive effects shared table to apply to a permutation.

If interactive effects are not applied to this measure, map this field to the "Null Values" shared data table using the "Null Values: Not Applicable" option. If interactive effects are applied, create a new measure specific value table "Interactive Effect Applicability" and map this value table column. The IE Table name labels are the names of the interactive effects value tables used for the measure (ex. 2020-Com-InLtg or 2020-Res-InLtg).

For example, see SWLG009.

Peer Review QA/QC

- If interactive effects are applied, ensure that the proper Interactive Effects shared table has been chosen.
- If interactive effects are not applied to the measure, confirm that "None" is entered.

Measure Qualifier

Measure Developer

The Measure Qualifier is a descriptive field to define the source of savings. If this field not applicable, map this field to the "Null Values" shared data table using the "Null Values: None" option

Currently, this field is not in use.

Peer Review QA/QC

None.

DEER Measure ID

Measure Developer

The DEER Measure ID is an identifier specified to link the measure with impacts in the ex-ante database.

For DEER measures, the DEER Measure ID field is mapped to the DEER Measure ID parameter. For non-DEER measures, the field is mapped to map this field to the "Null Values" shared data table using the "Null Values: Blank" option.

If measure has mixture of DEER and non-DEER offerings, field is mapped to the "DEER Measure ID" column of the "Measure Offering IDs and DEER Measure IDs" value table. See SWWH025-05.

Note that is field will be used as for claims validation if the Measure Impact Type designates that this is a DEER measure (Deem-DEER or Deem-DEER-FuelSub).

Peer Review QA/QC

- Verify correct ID is specified.

Measure Cost ID

Measure Developer

For all measures, the field is mapped to the "Null Values" shared data table using the "Null Values: Blank" option.

Currently, this field is not in use.

Peer Review QA/QC

- Verify correct ID is specified.

Measure Impact Type

Measure Developer

Measure Impact Type designates the type of measure, which could include qualities like:

Deemed or Custom

CPUC Created or PA Created

Fuel Substitution, Normalized Metered Energy Consumption (NMEC), Randomized-Control Trail (RCT) or Strategic Energy Management (SEM)

Peer Review QA/QC

- Verify correct parameter is specified.
- Choices in this field trigger other requirements within the Measure Package such as: DEER Measure ID field, inclusion of fuel substitution references, etc.

Offering Description

Measure Developer

The offering description is created to be a subset of the Measure Description and a superset of the Measure Case Description.

This field is used directly within the CET created input file as the MeasDescription field.

The current guidelines are:

- UTF-8 character encoding
- Only ASCII characters are allowed to be submitted
- Non-ASCII characters and double quotation marks in a submission will result in the submission being rejected

Measure developers should consult CET documentation to ensure compliance with the most current guidelines.

This field could be used by program implementers and/or IOUs for use in product literature/program catalogue(s) for their customers.

Offering ID should be tied to the Offering ID Description in a one-to-one relationship that also spans measure versions. Therefore, there should never be more than one description for any single Offering ID in a measure. Furthermore, the Offering ID Description should remain the same across versions of the same measure.

(see the Offering ID in the Measure Summary section for related information)

Peer Review QA/QC

- Verify that Offering ID Description clearly describes the scope of each offering to a non-technical user.
- Verify compliance with CET requirements.
- Verify that the Offering ID Descriptions remain the same across versions.
- Verify that there is never more than one Offering ID Description for a single Offering ID.
- Verify that the same Offering ID Description is not used for multiple Offering IDs
- Verify that new Offering IDs are not recycled from older versions of the same measure.

Source Description

Measure Developer

This field is populated from the measure-level data and stored as the "MeasureVersionID". The field is built from a concatenation of two fields: Measure ID and Version ID to appear in this format:

SWAP001-01

Peer Review QA/QC

Not applicable.

Measure Detail ID

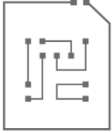
Measure Developer

This field is a unique identifier for each permutation. This field is populated with an auto-generated identifier created as a concatenation of:

MeasureVersionID
OfferingID
MeasAppType
DeliveryType
Sector
BldgType
BldgVint
BldgHVAC
BldgLoc
NTG_ID
GSIA_ID
PAType
PA

Peer Review QA/QC

- The Measure Version ID is updated when the measure is published from a draft version to published version. Upon committing the draft of the measure, this version ID will be set correctly within the Measure Detail ID. This ensures that all published permutations always include a unique Measure Detail ID.



Conventions

This chapter provides the conventions parameters, value tables, calculations, and measure characterization elements that are common across measures in the eTRM. Adopting conventions for common objects used for multiple measures throughout the eTRM will ensure consistency and transparency across all statewide measures and will enable users to quickly identify common objects whenever the API variable names are referenced (ex. calculations).

Data

Parameter List

The standard list of parameters and the order in which they should be uploaded and listed in eTRM are provided below.

Parameter Names and Order	Parameter Type
<i>[Measure Specific Parameters] (if applicable)</i>	<i>Non-shared</i>
Measure Application Type	Shared
<i>DEER Measure ID (if a DEER-based measure)</i>	Shared
<i>Energy Impact ID (if a DEER-based measure)</i>	Shared
Building Type	Shared
Building Vintage	Shared
Building Location	Shared
Building HVAC	Shared
Sector	Shared
Effective Useful Life ID	Shared
EUL-Version	Shared
<i>Host EUL ID (if MAT = AR or AOE)</i>	Shared
<i>EUL-Host-Version (if MAT = AR or AOE)</i>	Shared
EUL-Bldg Type = "Any"	Shared
Program Administrator Type	Shared
Program Administrator	Shared
Delivery Type	Shared
GSIA ID	Shared
<i>GSIA - Version (if GSIA ≠ default)</i>	Shared
<i>GSIA - Bldg Type (if GSIA ≠ default)</i>	Shared
<i>GSIA-PA (if GSIA ≠ default)</i>	Shared
<i>GSIA-Vintage (if GSIA ≠ default)</i>	Shared
Net to Gross Ratio ID	Shared
<i>NTG-Version (if NTG ID ≠ sector default)</i>	Shared

All parameters in black font are required for all measures, regardless of category.

Parameters in blue italic font are to be included if the specified criteria are met.

[Measure Specific Parameters] is group of parameters created specifically for a measure to distinguish the different measure offerings (e.g., capacity, efficiency tiers, etc.) if there is > 1 offering.

Parameters should be listed in the order shown here when viewed in the "Supporting Data" tab of the eTRM. Measure specific parameters are typically above all shared parameters.

Note that when parameters are added to value tables, the eTRM automatically builds table rows based on the order of the parameters in the parameter list. Parameters may be rearranged to reorder table rows, especially the Offering ID.

Parameter Names and Order	Parameter Type
Electric Load Shape	Shared
Gas Load Shape	Shared
Normalized Unit	Shared
Use Category	Shared
Use Sub Category	Shared
Technology Group	Shared
Pre-existing Tech Group	Shared
Standard Tech Group	Shared
Technology Type	Shared
Pre-existing Tech Type	Shared
Standard Tech Type	Shared
Cost Adjustment Types	Shared
Measure Impact Calculation Type	Shared
Measure Impact Type	Shared
Measure Qualifier	Shared
Version	Shared
Version Source ID	Shared
<i>Water Measure Type (if WEN Measure)</i>	Shared
Class First Baseline	Shared
Class Second Baseline	Shared
<i>Lighting Type (if there is interactive effects)</i>	Shared
<i>IE-Version (if there is interactive effects)</i>	Shared
<i>IE-Bldg Type (if there is interactive effects)</i>	Shared

Value Table List

The standard list of value tables and the order in which they should be uploaded and listed in eTRM is provided below.

All value tables listed in black font are required for all measures, regardless of category.

Value tables listed in blue italic font are to be included if the specified criteria are met.

[Value tables listed in bracket] are groups of measure specific value tables in the specified category, to be included if the specified criteria are met.

Value tables should be listed in the order shown here when viewed in the "Supporting Data" tab of the eTRM.

Value Table Names	Criteria	Value Table Type
Offering ID		Non-shared
Measure Offerings		Non-shared
<i>[All tables related to the storing and/or calculation of water savings data]</i>	<i>Only if applicable. Measure has water savings or consumes energy</i>	<i>Non-shared</i>
<i>[All tables related to the storing and/or calculation of energy savings data]</i>	<i>Only if applicable. Measure has energy savings or consumes water</i>	<i>Non-shared</i>
<i>[All tables related to the storing and/or calculation of costs data]</i>	<i>Only if applicable. Measure has costs</i>	<i>Non-shared</i>
Implementation Eligibility		Non-shared
Base Case Descriptions		Non-shared
<i>Measure Offering IDs and DEER Measure IDs</i>	<i>Only if it is a DEER based measure</i>	<i>Non-shared</i>
<i>Upstream Flag</i>	<i>Only if Delivery Type = DnDeemDI and/or DnDeemed + UpDeemed</i>	<i>Non-shared</i>
<i>Host EUL ID</i>	<i>Only if MAT = NC and/or NR + AR and/or AOE</i>	<i>Non-shared</i>
<i>Emerging Technologies</i>	<i>Only if there is ET project number</i>	<i>Non-shared</i>
<i>Interactive Effect Applicability</i>	<i>Only if there are interactive effects</i>	<i>Non-shared</i>
<i>Refrigerant Avoided Cost Calculations Outputs</i>	<i>Only if it is a Fuel Substitution measure</i>	<i>Non-shared</i>
<i>Technology IDs</i>	<i>Only if it some offerings are DEER-based and some offerings are not</i>	<i>Non-shared</i>
<i>Restricted Permutation Flag</i>	Add table if measure has: - Mixture of NEGM and non-NEGM offerings - OR NEGM offerings + Mixture of NC and other MATs - OR NEGM offerings + Mixture of {Com or Res} and other sectors - OR NEGM offerings + Mixture of TRCRatio < 1 and ≥ 1	<i>Non-shared</i>
<i>DEER Measure</i>	<i>Only if it is a DEER based measure</i>	<i>Shared</i>
<i>Energy Impact - [Use Category]</i>	<i>Only if it is a DEER based measure</i>	<i>Shared</i>
Gross Savings Installation Adjustments		Shared
" ... "-Default if the GSIA ID is default		
Effective Useful Life and Remaining Useful Life		Shared
<i>Effective Useful Life and Remaining Useful Life - Host</i>	<i>Only if MAT = AR or AOE</i>	<i>Shared</i>
Net to Gross Ratio		Shared

Value Table Names	Criteria	Value Table Type
" ... " - Nonresidential if NTG ID is the nonresidential default		
" ... " - Residential if the NTG ID is the Res-Default>2yrs		
<i>Water Energy Intensity</i>	<i>Only if it is a WEN measures</i>	<i>Shared</i>
<i>Groundwater Temperature</i>	<i>If needed. Table contains the average groundwater temperature derived from weather data for each CZ</i>	<i>Shared</i>
<i>Constants - Water Properties</i>	<i>If needed. Table contains the values for density, specific weight, and specific heat capacity of water</i>	
<i>Interactive Effects - Commercial</i>	<i>If savings calculations involve interactive effect</i>	<i>Shared</i>
<i>Interactive Effects - Residential</i>	<i>If savings calculations involve interactive effect</i>	<i>Shared</i>
<i>Coincident Demand Factor</i>	<i>If needed. Table contains the coincident demand factor adopted from the 2004-2005 DEER Update Study Final Report conducted by Itron Inc.</i>	<i>Shared</i>
<i>Constants</i>	<i>If needed. Table contains the most common conversion factors for calculations in the eTRM</i>	<i>Shared</i>
Null Values		Shared

Value Table Conventions

The conventions for value table names and APIs, column names and APIs, and units are provided below.

Value tables listed in black font are required. (See Value Table Name)

Columns listed in black font are required for the value table under which they are listed.

Value tables listed in blue italic font are to be included if the specified criteria are met.

Columns listed in blue font are optional for the table. Under which they are listed.

Green or Orange: An either/or option. Select the green set or the orange set of tables according to criteria (but not both)

Value Table Name	API Name	Parameter Selection	Column Name	Column API Name	Column Unit	Criteria
Offering ID	offerId	Parameters that generate unique list of SW offering ID	Statewide Measure Offering ID	ID	Text	
			Measure Offering Description	measOfferDesc	Text	
Measure Offerings	measOffer	Parameters that vary impacts	First Base Case Description	descBase1	Text	
			Measure Case Description	descMeas	Text	
			<i>Second Base Case Description</i>	<i>descBase2</i>	<i>Text</i>	<i>Include column if there is AR MAT</i>
<i>Annual Unit Energy Consumption - Baseline</i>	<i>UECBase</i>	Parameters that vary energy impacts	Average Demand	YrkW	kW	<i>Add table if measure has UEC data</i>
<i>Annual Unit Energy Consumption - First Baseline</i>	<i>UECBase</i>		Electric	YrkWh	kWh/yr	<i>Specify baseline number if there is AR MAT</i>
<i>Annual Unit Energy Consumption - Second Baseline</i>	<i>UECBase2</i>		Gas	YrTherm	therm/yr	
<i>Annual Unit Energy Consumption - Measure Case</i>	<i>UECMeas</i>	Parameters that vary energy impacts	Average Demand	YrkW	kW	<i>Add table if measure has UEC data</i>
			Electric	YrkWh	kWh/yr	
			Gas	YrTherm	therm/yr	

Value Table Name	API Name	Parameter Selection	Column Name	Column API Name	Column Unit	Criteria
Annual Unit Energy Savings	UES	Parameters that vary energy impacts	Peak Demand Reduction	YrkW	kW	Add table if savings are imported directly into eTRM (i.e., not calculated in eTRM)
Annual Unit Energy Savings – First Baseline	UES		Electric	YrkWh	kWh/Yr	Specify baseline number if there is AR MAT
Annual Unit Energy Savings – Second Baseline	UES2		Gas	YrTherm	Therm/Yr	
Annual Unit Water Savings	UWS	Parameters that vary water impacts	Annual Unit Water Savings	gal	Gals/Yr	- Add table if measure has water savings data. - Can modify to have consumption data and multiple baselines. Follow UEC format, but replace E with W (for water)
				gal2	Gals/Yr	Include column if there is AR MAT
Costs	costs	Parameters that vary costs	First Base Case Labor Cost	laborBase	United States dollars	Add table if costs are not calculated.
			First Base Case Material Cost	mtlBase	United States dollars	
			Measure Case Labor Cost	laborMeas	United States dollars	
			Measure Case Material Cost	mtlMeas	United States dollars	
			Second Base Case Labor Cost	laborBase2	United States dollars	Include column if there is AR MAT
			Second Base Case Material Cost	mtlBase2	United States dollars	Include column if there is AR MAT

Value Table Name	API Name	Parameter Selection	Column Name	Column API Name	Column Unit	Criteria
[First Base Case/Measure Case/none] [Labor/Material/none] Cost - Calculation Inputs	costs[Labor/Mtl/{NULL}] [Base/Meas/{NULL}]	Parameters that vary costs	All calculation inputs	Varies	Varies	- If any cost values (Base/Measure Case Labor/Material Cost) are calculated, add table to hold values for the calculation inputs. - Follow the naming formula to create table
Implementation Eligibility	implementationEligibility	MAT	Available?	available	Text	
		Delivery Type				
		Sector				
Base Case Descriptions	description	Parameters that generate unique list of SW offering ID (Must be the same as Offering ID table)	Statewide Measure Offering ID	ID	Text	
			Existing Description	Ex	Text	
			Standard Description	Std	Text	
Measure Offering IDs and DEER Measure IDs	offerIdDEERId	Parameters that generate unique list of SW offering ID (must be the same as Offering ID table)	Statewide Measure Offering ID	ID	Text	Add table if DEER Based Measures
		DEER Measure ID (if available)	DEER Measure ID (if shared parameter is not available)	dDEERID	Text	Select the parameter if available (e.g., savings are directly from DEER) Else, create the column
			Relationship OR Relationship (with Custom ID)	relationship	Text	Green: If savings are directly from DEER Orange: If savings are modified from DEER with custom IDs
		Version Source (if available)	Version Source	versionSource	Text	Select the parameter if available (e.g., savings are directly from DEER) Else, create the column

Value Table Name	API Name	Parameter Selection	Column Name	Column API Name	Column Unit	Criteria
Upstream Flag	upstreamFlag	Delivery Type	Upstream Flag	upstreamFlag	Boolean	Add table if there are multiple delivery types + UpDeemed
Host EUL ID	hostEULID	MAT	ID	ID	Text	Add table if there are multiple MATs + AOE and/or AR.
		Host EUL ID (if more than 1)	RUL_Yrs	rULYrs	Years (Decimal)	Include "RUL_Yrs" column if multiple MAT + AR
Emerging Technologies	emergingTech	Parameters that generate unique list of SW offering ID	ETP Flag (Project Number)	projectNumber	Text	Add table if there is emerging technologies project
			Program Funding Year	programFunding Year	Text	
			Year Introduced to Programs	introYear	Date	
Interactive Effect Applicability	IEApplicability	Parameters that vary IE applications	IE Applicable?	IEApplicable	Boolean	Add table if measure include interactive effects (typically DEER lighting IE) Add "IE Applicable?" column if some permutations include IE and some do not.
			Interactive Effects Table Name	IETableName	Text	
Refrigerant Avoided Cost Calculations Outputs	rACCOutputs	Parameters that vary refrigerant avoided costs outputs	Refrigerant NPV Benefits - Pre-Existing Baseline	refrigNPVBenefit sEx	United States dollars	Add table if it is a Fuel Substitution measure
			Refrigerant NPV Benefits - Standard Baseline	refrigNPVBenefit sStd	United States dollars	-
			Refrigerant NPV Benefits - Measure	refrigNPVBenefit sMeas	United States dollars	-
			Refrigerant NPV Costs - Pre-Existing Baseline	refrigNPVCostsE x	United States dollars	-

Value Table Name	API Name	Parameter Selection	Column Name	Column API Name	Column Unit	Criteria
			Refrigerant NPV Costs - Standard Baseline	refrigNPVCostsStd	United States dollars	-
			Refrigerant NPV Costs – Measure	refrigNPVCostsMeas	United States dollars	-
			Unit Refrigerant Cost	unitRefrigCost	United States dollars	-
			Unit Refrigerant Benefits	unitRefrigBenefits	United States dollars	-
Technology IDs	techId	Parameters that generate unique list of SW offering ID	Statewide Measure Offering ID	ID	Text	
			Measure Technology ID	measTechID	Text	
			Pre-existing Technology ID	preTechID	Text	
			Standard Technology ID	stdTechID	Text	
Restricted Permutation Flag	restrictPerm	Parameters that can vary whether Restrict Perm = 0 (TRC Ratio ≥ 1 or N/A) and Restrict Perm = 1 (TRC Ratio < 1)	Value	value	Number	Add table if measure has a mix of 0 and 1 values, which occurs when: - Mixture of NEGM and non-NEGM offerings - OR NEGM offerings + Mixture of NC and other MATs - OR NEGM offerings + Mixture of {Com or Res} and other sectors - OR NEGM offerings + Mixture of TRCRatio < 1 and ≥ 1

Calculation Conventions

The conventions for calculation names and APIs, parameter selection, and units are provided below

Calculations with a star (*) at the beginning are required.

Calculations listed in blue italic font are to be included if the specified criteria are met.

Green or Orange: An either/or option. Select the green set or the orange set of tables (or none) according to criteria (but not both)

Calculation Name	Description	Calculation API Name	Parameter Selection	Unit	Criteria
Annual Unit Water Savings	(none)	UWS		Gal/yr	If water savings are calculated
Annual Unit Water Savings - First Baseline	(none)	UWS1	MAT (if multiple MAT + NC/NR)	Gal/yr	For above calculations, specify baseline # if there is AR MAT
Annual Unit Water Savings - Second Baseline	(none)	UWS2	MAT (if multiple MAT + AR)	Gal/yr	
IOU Embedded Energy Savings	(none)	iOUEmbedUES		kWh/yr	Create the three EmbedUES calculations if there are water savings
Non-IOU Embedded Energy Savings	(none)	nonIOUEmbedUES		kWh/yr	
Total Embedded Energy Savings	(none)	totalEmbedUES		kWh/yr	
[Three Embedded UES calculations above] - First Baseline	(none)	[Three APIs above]	MAT (if multiple MAT + NC/NR)	[See above]	For the above calculations, specify baseline # if there is AR MAT
[Three Embedded UES calculations above] - Second Baseline	(none)	[Three APIs above]2	MAT (if multiple MAT + AR)	[See above]	
Annual Unit Energy Consumption - Electric, Baseline	(none)	UEC_YrkWhBase		kWh/yr	If baseline energy consumption is calculated
Average Demand - Baseline	(none)	UEC_YrkWBase		kW	
Annual Unit Energy Consumption - Gas, Baseline	(none)	UEC_YrThermBase		therm/yr	
[Three UEC calculations above] - First Baseline	(none)	[Three UEC API]	MAT (if multiple MAT + NC/NR)	Three UEC units	For the above calculations, specify the baseline # if there is AR MAT
[Three UEC calculations above] - Second Baseline	(none)	[Three UEC API]2	MAT (if multiple MAT + AR)	Three UEC units	
Annual Unit Energy Consumption - Electric, Measure Case	(none)	UEC_YrkWhMeas		kWh/yr	If measure case energy consumption is calculated
Average Demand - Measure Case	(none)	UEC_YrkWMeas		kW	
Annual Unit Energy Consumption - Therm, Measure Case	(none)	UEC_YrThermMeas		therm/yr	

Calculation Name	Description	Calculation API Name	Parameter Selection	Unit	Criteria
Annual Unit Energy Savings - Electric	(none)	UES_YrkWh		kWh/yr	If energy savings are calculated
Peak Demand Reduction	(none)	UES_YrkW		kW	
Annual Unit Energy Savings - Gas	(none)	UES_YrTherm		therm/yr	
[Three UES calculations above] - First Baseline	(none)	[Three UES API]		Three UES units	For the above calculations, specify the baseline # if there is AR MAT
[Three UES calculations above] - Second Baseline	(none)	[Three UES API]2	MAT (if multiple MAT + AR)	Three UES units	
Labor Cost	(none)	costs_labor	MAT (if multiple MAT + NR/NC)	United States Dollars	If {labor cost is calculated} AND {labor cost is the same between base and measure case}
First Base Case Labor Cost	(none)	costs_laborBase		United States Dollars	If {labor cost is calculated} AND {labor cost is different between base and measure case}
Measure Case Labor Cost	(none)	costs_laborMeas		United States Dollars	
Second Base Case Labor Cost	(none)	costs_laborBase2		United States Dollars	If labor cost is calculated and there is AR MAT
First Base Case Material Cost	(none)	costs_mtlBase	MAT (if multiple MAT + NR/NC)	United States Dollars	If material cost is calculated
Measure Case Material Cost	(none)	costs_mtlMeas		United States Dollars	If material cost is calculated
Second Base Case Material Cost	(none)	costs_mtlBase2	MAT (if multiple MAT + AR)	United States Dollars	If material cost is calculated and there is AR MAT
*Incremental Costs	(none)	incrCost	MAT (if multiple MAT + NR/NC)	United States Dollars	Required calculation
*Incremental Costs - First Baseline	(none)	incrCost	MAT (if multiple MAT + NR/NC)	United States Dollars	Required calculation
*Incremental Costs - Second Baseline	(none)	incrCost2	MAT (if multiple MAT + AR)	United States Dollars	Specify baseline # if there is AR MAT
First Baseline Life	(none)	firstBaselineLife	MAT (if multiple MAT + AOE/AR)	Years	If First Baseline Life is calculated, typically when: 1. {there is AOE MAT} or 2. {there are multiple MATs with different baseline life calculation methodologies}
Second Baseline Life	(none)	secondBaselineLife	MAT (if multiple MAT + AR)	Years	If there is AR MAT

Calculation Name	Description	Calculation API Name	Parameter Selection	Unit	Criteria
Restricted Permutation Flag	(none)	restrictPermFlag	Vary	Number	If needed to map the Restricted Permutation data spec field due to: - Large non-exempt gas measure - The "Restricted Permutation Flag" values need to be mapped to different value tables for different sets of permutations

Permutations Data Spec Field

See the “eTRM - Data specification - 2.7 w validity.xlsx” for the typical mapped object for each permutations data spec field



Cost Effectiveness Tool (CET) Run Input Data Conventions

The conventions for the CET run input data fields are provided below. Note that these conventions only apply to CET runs for which the outputs will be uploaded into the eTRM and not for the Restricted Permutation field.

Run Input Data Field Name	Input Field	eTRM Convention	Example (Measure Start Date 1/1/2024)
Set the CET run parameters	First Year	Select the year that matches the start year of the measure	2024
	Avoided Cost	Select the appropriate option from the “Program year assignment to CET avoided cost version” table (Note: Use the start year used in “First Year” as the Program Year)	2024
	Market Effects	0%	0%
Browse to your input field	ClaimYearQuarter (Measure.csv)	Modify the file and input the appropriate start year of the measure, as well as the quarter to Q3	2024Q3
	PrgYear (ProgramCost.csv)	Modify the file and input the appropriate start year of the measure	2024
	ClaimYearQuarter (ProgramCost.csv)	Modify the file and input the appropriate start year of the measure, as well as the quarter to Q3	2024Q3

Cost Effectiveness Tool (CET) Run for Restricted Permutation Conventions

The conventions for the CET runs used to calculate the Restricted Permutation Flag are provided below:

1st Run: Get TotalSystemBenefit to calculate program costs

Run Input Data Field Name	Input Field	eTRM Convention
Set the CET run parameters	First Year	2022
	Avoided Cost	2021
	Market Effects	0%
Browse to your input field	ClaimYearQuarter (Measure.csv)	2022Q1
	PrgYear (ProgramCost.csv)	2022
	ClaimYearQuarter (ProgramCost.csv)	2022Q1

2nd Run: CET run with program costs to calculate TRCRatio

Run Input Data Field Name	Input Field	eTRM Convention	Example (Measure Start Date 1/1/2024)
Set the CET run parameters	First Year	Select the year that matches the start year of the measure	2024
	Avoided Cost	Select the appropriate option from the "Program year assignment to CET avoided cost version" table	2024
	Market Effects	0%	0%
Browse to your input field (ProgramCost.csv)	PrgID	Pull in the CEInputID from Measure.csv file	SWHC027-03-I-NC-DnDeemed-Res-MFm-New-rDXGF-CZ01-Res-sAll-mHVAC-Pkg-dn-Def-GSIA-Any-Any
	PrgYear	Modify the file and input the appropriate start year of the measure	2024Q1
	AdminCostsOverheadAndGA	Calculate as [2022Q1 Total System Benefit] * [AdminCost / TSB] Round to 2 decimal points	1.63
Browse to your input field (Measure.csv)	PrgID	Set the PrgID = CEInputID	SWHC027-03-I-NC-DnDeemed-Res-MFm-New-rDXGF-CZ01-Res-sAll-mHVAC-Pkg-dn-Def-GSIA-Any-Any
	ClaimYearQuarter (Measure.csv)	Modify the file and input the appropriate start year of the measure, as well as the quarter to Q1	2024Q1
	UnitIncentiveToOthers	Calculate as 50% of the UnitMeaCost1stBaseline Round to 2 decimal points	76.57

Measure Characterization

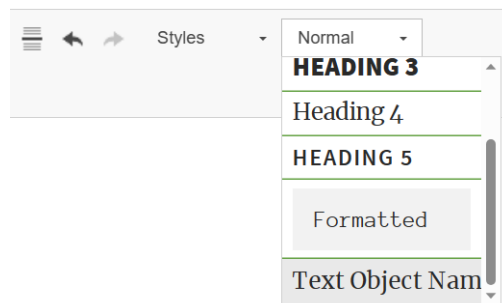
The conventions for various text elements in the measure characterizations are provided below

Value table

Static table convention

Follow these conventions when creating static tables.

- Static table must have a title
 - o Do not include a table number as tables can be added/removed/moved and the numbers will become misaligned.
 - o Place title above the table
 - o Format using the "Text Object Name" paragraph format



- Include header rows and/or columns
- Footnote (if need):
 - o Place at the end of the value table (either in the last row of the table or in the main body text right below the table)
 - o Italicize and superscript the text
 - o Use manual line break (Shift + Enter) to separate each line item

No Table #; Table name is formatted as "Text Object Name"

COLUMN 1	COLUMN 2	COLUMN 3
Row1	a	b
Row2	c	d

1. Table footnotes are italicized and super-script

2. Footnotes items are separated by a manual line break (Shift + Enter)

Dynamic table convention

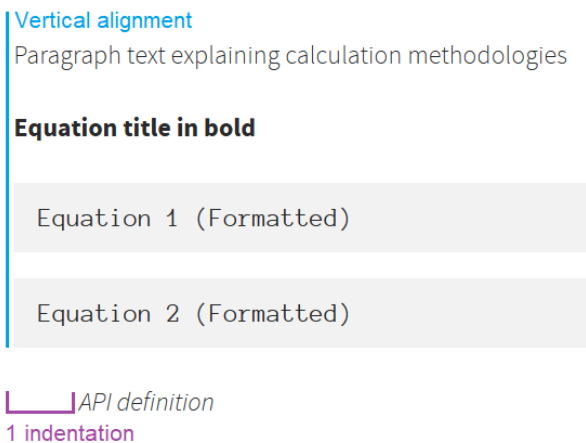
Dynamic tables should always be used if available.

Calculation

Static calculation

Follow these conventions when creating static calculation

- Calculation title is optional
 - o Do not include an equation number (as calculations can be added/removed/moved and the numbering will become misaligned)
 - o If the calculation has a title, place this title above the equations and bold the text.
- Equations:
 - o Format equation using the “Formatted” paragraph format. Each group of equations should have its own separate grey box
 - o Do not bold or italicize the equation text
 - o Be consistent with the symbols (e.g., * versus x for multiplication sign)
 - o Only use characters supported by the eTRM
- Both title and equation should be left-justified and indented (as needed) so that they vertically align with the paragraph text it belongs to
- All calculations must include API definition to describe the API names used in the equation



Dynamic calculation

Dynamic calculations should always be used if available.

API definition convention (for both static and dynamic calculation)

Every calculation (dynamic or static) must have an API definition defining the API names in the equation. Follow these conventions when adding API definition.

- API definition is directly under the equations
- Each API definition structure:

API Name = API definition (Unit in parenthesis)

- o API names should be exactly as they appear and defined in the order they appear in the equation
- o If API names come from a value table and/or calculations, the API definition should use the exact same name of the value table column and/or calculation. This allows readers to easily trace the variables
- o Use sentence case: ex. UEC = Annual unit energy consumption (kWh)
- Each API definition is separated by a line break (Shift + Enter)
- Indent the API definition 1 tab from the equation
- Italicize the API definition

$$a = b + c$$

a = a definition in italics (unit)
b = b definition (unit)
c = c definition (unit)

← Line break (Shift + Enter)
between each API
definition

Image/Video


The conventions to add an image to the asset library are provided below. Video follows the same convention.

- Crop out image borders and title. If a chart, keep the axis titles
- When adding image to the asset library
 - o Title = <Measure ID> Image <image # added for the measure ID>
 - o Asset Folder = Measure use category
 - o Caption = Name of the image (e.g., chart title)

TITLE*

SWFS101 Image 1 <MeasureID> Image <Image #>

IMAGE*



Change

Allowed image formats are PNG, JPG, GIF. Recommended minimum image size is 904px

TAGS

Enter Tag Here

Find tags by name or create new ones.

ASSET FOLDER

Food Service (FS) Measure Use Category

The folder to put this asset into.

CAPTION

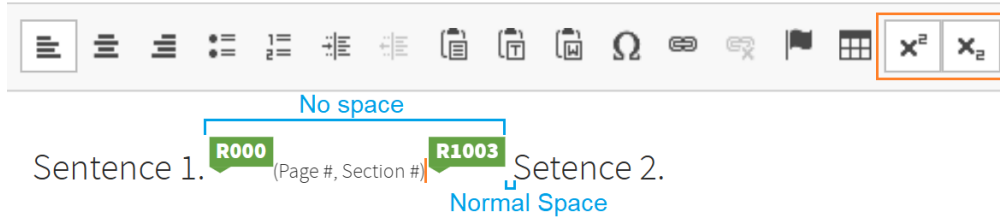
One-Lane High Performance Conveyor Toaster Name of image

Hide caption

- When embedding image to the measure characterization
 - o Select "Center" alignment to embed the image at full-size (and in-line with text wrapping)
 - o Select "Left" or "Right" alignment to embed the image at half-size (and with text wrapping)
 - o Leave the caption blank

References

Reference tags should be added at the end of the sentence, after punctuation, and no space. Page number, if applicable, should be added in parentheses and formatted as superscript → subscript.



Embedded references are added for table rows or at the end of a section (if it's a CPUC Disposition).

COLUMN 1	COLUMN 2	REFERENCE
Row1	a	“ R000



Guidelines for the Manager Review

The primary objective of the Manager Review is to assess if the measure analysis and presentation is complete and accurate and to authorize the measure progress to next measure status –Cal TF Staff Review. This review entails a higher-level of QA/QC than the Peer Review and the Manager Review is not intended to duplicate the peer review summarized in this document.

The Manager Review shall include (but should not be limited to) the following:

Manager Review

- Verify that all Peer Review comments were adequately addressed.
- Document the extent of statewide coordination for measure development.
- Document that the measure impacts and cost effectiveness metrics are derived for implementation in all California climate zones, if applicable.
- If the measure was previously reviewed by Cal TF, confirm issues and comments were properly addressed and documented.
- If the measure was previously reviewed the CPUC, confirm issues and comments are properly addressed and documented.



Guidelines for Measure Documentation and References

Measure documentation and references refers to the sources of inputs, assumptions, data, and other information used to derive energy consumption, energy usage, energy and demand impacts, costs, and other cost effectiveness inputs. Such documentation includes (but is not limited to): documentation of prior measure versions (workpapers/measure packages), technical analyses, calculation spreadsheets, field studies, EM&V studies, laboratory test results, and market studies. Although studies within California will be the most relevant, studies from outside of the State should be considered and utilized, particularly for non-weather sensitive measures.

The measure development and peer review QA/QC necessarily includes confirmation of appropriate documentation such that all aspects of the measure are *transparent*, and the derivation of impacts and cost effectiveness metrics are *reproducible*. Guidelines for documentation that apply to all fields are provided below.

Measure Developer

All assumptions, input values, and data sources must be appropriately cited.

All cited references must be provided to the designated eTRM Administrator to be uploaded to the eTRM reference library. Once a reference is uploaded to the eTRM reference library it can be embedded as a reference in a measure characterization field text, in a static table, in a value table column or row, or associated with an entire value table.

The cited reference should be the *original* source of data/information if available, rather than a secondary source.

Manufacturer test data is not acceptable documentation of equipment performance; only data from an independent, third-party organizations are accepted to develop baseline and measure performance parameters.

Internet links to documents are not accepted, as URLs may change or become inactive/no longer in service and/or the information presented on a website may be modified after it is referenced.

If a website is referenced, a PDF of the website page must be created and appropriately cited to substantiate an online reference.

Personal communications are not valid references for inputs used to derive UEC, UES, costs, or other cost effectiveness inputs. Examples include: conversations, interviews, lecture material, telephone conversations, letters, e-mail messages, and social media posts. Personal communication for descriptive or supporting information is acceptable only if correctly documented with the name, organization, title of the contact, as well as the date and subject of the communication. Permission must be granted.

A proprietary reference or data file must be appropriately cited and available throughout the measure review and approval process and upon request by authorized staff.

All proprietary data that is not authorized for the eTRM reference library but is necessary to accompany the measure through the review process shall be clearly identified as Proprietary. A reference citation will be created in the eTRM library and noted as such. The reference file will not be attached to the library entry.

Peer Review QA/QC

- Validate all values, inputs, and assumptions in the cited reference. Flag all values, inputs, and assumptions that are not supported by the cited reference.
- Ensure each cited reference conforms to standards of “best available data”. Flag any values/inputs/assumptions for which the reference does not meet “best available criteria”.
- A copy of each cited reference is submitted with the measure. A cited reference for which the reference file is not provided should be flagged as such.
- Confirm all references and source data that are proprietary and are identified as such.
- Identify all assumptions, claims, data for which a reference and citation are required but not provided. Flag an input, assumption, statistic, finding, or claim that is not supported by a reference.
- Verify that all reference materials can be uploaded in the eTRM reference library. Flag all citations/references that include proprietary data/information and cannot be uploaded to the eTRM reference library.

The following table lists the types of references that are commonly used for measure documentation.

Reference Type	Examples	Documentation to Provide for eTRM Library
Saturation Study	Commercial End Use Survey (CEUS) Residential Appliance Saturation Survey (RASS)	Copy of the report and appendices.
Regulatory document (e.g., CPUC Decision, Resolution, Disposition)	Resolution E-4818 Comprehensive Workpaper Disposition for: Screw-in Lamps.	Preferred: Copy of the regulatory document Minimum: Decision/Resolution number and proceeding number Referenced location (e.g., page #, table #, ordering paragraph)
California standards	Appliance Efficiency Regulations (Title 20) Building Energy Efficiency Standards (Title 24)	Preferred: Copy of the document Minimum: Agency Standard or report year Standard or report name Report number Referenced location (e.g., section, page #, table #)
Federal Regulations	Code of Federal Regulations Energy Policy Act	Preferred: Copy of the document Minimum: Agency Regulation title and number Section and/or table number
Test Standards or Industry Guidelines	ASHRAE handbook	Agency Publication title Standard date Standard title, number, and section
Laboratory Test Report	Food Service Technology Center (FSTC) Appliance Performance Report	Copy of the report and all appendices
Qualified/Certified Product List	FSTC Qualified Product List (QPL)	Preferred: File with download of dataset Date of download Minimum: Authoring organization Database/specification name URL Parameters used to filter or develop list Parameter bounds/values Date of download

Reference Type	Examples	Documentation to Provide for eTRM Library
Calculation Tool Model	Motor Master AirMaster Plus ENERGY STAR calculator	Preferred: Downloaded tool/calculator Date of download Version number Minimum: Authoring organization Tool name Version number URL Input parameters and values used Date of download/accessed
DEER	Unit energy consumption (UEC) Unit energy savings (UES) NTG EUL GSIA Measure costs	Copy of regulatory directive (resolution, disposition) that directed the adoption of value(s). For UES values from DEER: DEER ID MASControl version CSV file of values Any filters applied Documentation of any adjustments (interpolation, extrapolation, etc.) Engineering equation For NTG, EUL, GSIA, cost from DEER: DEER update report and/or spreadsheet Original source of DEER value Master documentation spreadsheet
Evaluation	Impact Evaluation of 2013-14 Upstream and Residential Downstream Lighting Programs.	Copy of the evaluation report and all appendices. If appropriate, copy of regulatory directive (resolution, disposition) that directed the adoption of value(s).
Other Study Types Potential Study Measure Cost Market Briefing	Commercial Refrigeration Potential Study Measure Cost Study	Copy of the report and appendices.
Field Monitoring Study	Emerging Technology study	Copy of the report and all appendices.
Conference Paper	Paper in ACEEE Summer Study on Energy Efficiency in Buildings Proceedings	Copy of the paper with proceedings title, issue, issue/volume number, page number of proceedings.
Journal Article	ASHRAE Journal	Copy of the article with publication title, date, issue/volume and page #.
Memorandum	KEMA memo on EULs	Copy of the memo and any appendices or support documents. If appropriate, copy of the regulatory directive to adopt memo results, analysis, and/or recommendations.

Reference Type	Examples	Documentation to Provide for eTRM Library
Dataset	Program tracking data Web-scraped cost data Weather data California Energy Commission (CEC) Modernized Appliance Efficiency Database System (MAEDS)	Data set in Excel or other common format, with clear documentation of author, contents, date, and source. If derived from online databases or product listings, a download of the data should be provided along with the URL, the filter parameters, and access date. If a download is not available, record the URL, the filter parameters, and access date.
Website	ENERGY STAR description of energy efficient features compared to standard model.	PDF of webpage with headers and footers or other documentation of the URL and date accessed.