eTRM Custom Measures

Design / Version 1.2 / 01/24/2023

This "Phase 1" of eTRM development for Custom creates a new measure type – Custom Measures – to host custom measure information (e.g., custom measure characterizations, savings calculation methods, etc.) and custom calculation tools for use in calculating custom measure savings. These developments focus on the eTRM as a source for calculation guidance and tools for custom measures; they do NOT include any functions related to intake, storage, or tracking of site-specific data.

Custom Measures are a type of measure that do not have pre-calculated savings values but instead document data requirements and calculation methods to determine energy savings when a custom project is implemented.

This document outlines the supporting views and functionality for this new type of measure in eTRM.

Custom Library
& Calculation Tools

Calculation tools are tools outside the eTRM (usually Excel-based files) that are used to perform and document calculations used for Custom Measures, and can be linked to one or more Custom Measures in the eTRM.

The Custom Library is a new section of the eTRM to host calculation tools and other custom resources.

Custom Library View

Custom Library

eTRM
OFFICIAL SOURCE
CA Energy Efficiency
Measure Data

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Calculation Tools

Calculation tools are files used to calculate savings for custom measures.

Click on the name to navigate to the tool's detail page

Boiler Load Balance and Scorecard Tool

Excel workbook to determine boiler load factor

Chiller Workbook

To be used in measures related to chiller system upgrades

DOE MEASUR Calculators

External weblink to DOE's suite of MEASUR calculators

HVAC Tool

Excel workbook for calculating savings for multiple HVAC measures on CHW, HW, and air-side systems (also known as the PG&E HVAC Tool)

Templates

Templates are resources to help with the development of projects, studies, and reports.

Project Feasibility Study Template, version 1.0

This document is a template for implementers to use and fill out in describing a feasibility study to be submitted to the CPUC.

Post Installation Summary Report, v1.0

This document is a template for implementers/project developers to use and fill out as the post-installation report that is to be submitted…

The Custom Library is a new section in the eTRM that lists all custom tools.

Project developers may click on each name (hyperlink text in green) to navigate to each tool's detail view, where they can read the tool's description, view its version history, view linked custom measures, and download the tool for their custom project.

The versioning, editing, and access controls of calculation tools are identical to other eTRM Shared Data objects.

Custom tools are shown grouped by type. Each column is one type of tool listed in alphabetical order, with a description of up to two lines of text.

Admin users may manage custom tools in Admin Central

Calculation Tool View

eTRM
OFFICIAL SOURCE
CA Energy Efficiency Measure Data

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⚙ chillerWorkbook-002 **CPUC APPROVED** Dec 30, 2022 12:05 PM

Version History

Access past versions of the tool and the incremental changes between versions

Version and status

‹ **CUSTOM LIBRARY**

Chiller Workbook

Name

View all the eTRM measures that use this tool. This is one method to see related measures

DETAILS   **DEPENDENCIES**   SUBSCRIPTIONS

Calculation Tool

To be used in measures related to chiller system upgrades.

Type

Full description

📄 **Chiller Workbook**
XLSX / 12 MB : CALCULATION TOOL

Download button with name, file metadata, and type

A calculation tool's detail view has the same tabs as a Shared Parameter

The dependencies tab allows the user to view all downward dependencies, i.e. all the eTRM objects that depend on this custom tool

The subscriptions tab allows the user to subscribe to announcements related to this calculation tool

Discussion topic:
Will the list of deemed-workflow statuses cover all the cases for a custom tool?

Draft
CalTF Affirmation
POU Ready
CPUC Review
CPUC Approved

Dependencies view:

ASSOCIATED OBJECT	VERSION	STATUS	TYPE
Chiller System Upgrade	CMAP001-01	CPUC Approved	Measure

Custom Measures

This section presents the appearance of a Custom Measure as seen by both a Base User (read only) and Measure Developer (editing)

Custom Measure View

CMAP001-01   Dec 1, 2022 1:00 PM   Version History

Chiller System Upgrade

CHARACTERIZATION   **DEPENDENCIES**   **SUPPORTING DATA**   **CALCULATIONS**   **PERMUTATIONS**   **SUBSCRIPTIONS**

Admin

Measure Details

MEASURE TYPE
Custom

MEASURE ID
CMAP001

MEASURE NAME
Chiller System Upgrade

SOURCE DESCRIPTION
CMAP001-01-1

USE CATEGORY
AP - Appliance or Plug Load

EFFECTIVE DATE
January 1, 2023

Measure Package

The Measure Package includes: CSV files of parameters, value tables, permutation table and reference files, a PDF of the characterization, as well as the measure JSON file (JavaScript Object Notation, a text file format used for structured data).

Download Measure

Or you can download a PDF of the characterization only, separate from the full Measure Package.

Characterization
PDF

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Technology Summary

Measure Case Description

Base Case Description

Code Requirements

Program Requirements

Program Exclusions

Data Collection Requirements

Electric Savings (kWh)

Peak Electric Demand Reduction (kW)

Gas Savings (Therms)

Life Cycle

Base Case Material Cost

Measure Case Material Cost

Base Case Labor Cost

Measure Case Labor Cost

Net-to-Gross

Gross Realization Rate (GRR)

Non-Energy Impacts

DEER Differences Analysis

Importing a Calculation Tool into a Custom Measure

RELEASE ASSIGNMENT *You are now assigned to this measure. No other user will be permitted to make edits until you release it.*

eTRM
OFFICIAL SOURCE
CA Energy Efficiency Measure Data

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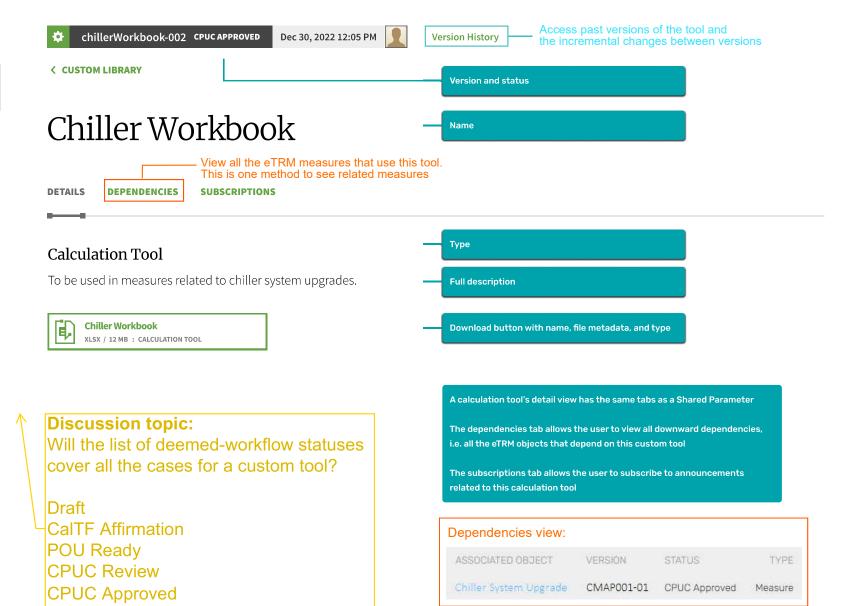
MEASURE DATA PROPERTIES

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DRAFT   Dec 1, 2022 3:48 PM   Version History   Measure Log

Chiller System Upgrade

CHARACTERIZATION   DEPENDENCIES   SUPPORTING DATA   CALCULATIONS   PERMUTATIONS   SUBSCRIPTIONS

Upward

SHARED MEASURE PARAMETERS

Building HVAC   v010   CPUC APPROVED

Building Location   v010   DRAFT

Building Type   v010   DRAFT

IMPORT A SHARED PARAMETER

SHARED VALUE TABLES

Constants   v010   DRAFT

Effective Useful Life and
Remaining Useful Life   v010   DRAFT

IMPORT A SHARED VALUE TABLE

CALCULATION TOOLS

This measure does not contain any calculation tools.

IMPORT A CALCULATION TOOL

RELEASE ASSIGNMENT You are now a

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DRAFT   Dec 1, 2022 3:4

Chiller System

CHARACTERIZATION   DEPENDENCIES

Upward

SHARED MEASURE PARAMETE

Building HVAC

Building Location

Building Type

IMPORT A SHARED PARAMETER

SHARED VALUE TABLES

Constants

Effective Useful Life and
Remaining Useful Life

✕

VERSION HISTORY

Chiller Workbook

VERSION ID		STATUS	CHANGE DESCRIPTION
P chillerWorkbook-002-1 CHOOSE ✕		blished	Short description of this change
P chillerWorkbook-001-1		Draft	Short description of this change

Save   Cancel

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🔓 **RELEASE ASSIGNMENT**   You are now assigned to this measure. No other user will be permitted to make edits until you release it.

⚙ ▨▨▨ DRAFT ▨▨▨ Dec 1, 2022 3:48 PM 👤   Version History   Measure Log

Chiller System Upgrade   ⚙

▤ **CHARACTERIZATION**   **DEPENDENCIES**   ▤ **SUPPORTING DATA**   ▤ **CALCULATIONS**   **PERMUTATIONS**   **SUBSCRIPTIONS**

Upward

SHARED MEASURE PARAMETERS

Building HVAC   ⚙ v010   CPUC APPROVED

Building Location   ⚙ v010   DRAFT

Building Type   ⚙ v010   DRAFT

IMPORT A SHARED PARAMETER

SHARED VALUE TABLES

Constants   ⚙ v010   DRAFT

Effective Useful Life and
Remaining Useful Life   ⚙ v010   DRAFT

IMPORT A SHARED VALUE TABLE

CALCULATION TOOLS

Chiller Workbook   ⚙ v002   CPUC APPROVED

IMPORT A CALCULATION TOOL

Calculation Tools in Calculations

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🔓 **RELEASE ASSIGNMENT** | *You are now assigned to this measure. No other user will be permitted to make edits until you release it.*

⚙ ▨▨▨ **DRAFT** | Dec 1, 2022 3:48 PM 👤 | Version History | Measure Log

Chiller System Upgrade ⚙

▤ **CHARACTERIZATION**   **DEPENDENCIES**   ▤ **SUPPORTING DATA**   ▤ **CALCULATIONS**   **PERMUTATIONS**   **SUBSCRIPTIONS**

Calculation Tools

REORDER CALCULATION TOOLS

Chiller Workbook

To be used in measures related to chiller system upgrades

📄 **Chiller Workbook**
XLSX / 12 MB : CALCULATION TOOL

Calculations

Calculations are the primary mechanism for eTRM to convert input values (e.g., hours of use, efficiency factors, load factor, material and labor costs) into useful output values including energy savings, natural gas impacts, and incremental measure costs. Calculations are performed serially, starting with the first equation on this page and progressing down until all equations are done. Measures with savings determined via simulation modeling generally have limited or no savings equations here; more information regarding savings approaches can be found on the **Characterization** tab for this measure.

ADD CALCULATION

REORDER CALCULATIONS

Multifamily Common Area Scaling Factor *in ratio*

CONFIGURE ⚙

VALIDITY	EQUATION (RATIO)
✓	$\dfrac{constCycles\_MFm}{constCycles\_single}$

Including a Calculation Tool in a Characterization

Measure Developers may use the rich text editing functionality to embed a measure's calculation tool into the body of a characterization section

RELEASE ASSIGNMENT You are now assigned to this measure. No other user will be permitted to make edits until you release it.

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DRAFT   Dec 1, 2022 1:00 PM   Version History   Measure Log

Chiller System Upgrade

CHARACTERIZATION   DEPENDENCIES   SUPPORTING DATA   CALCULATIONS   PERMUTATIONS   SUBSCRIPTIONS

Measure Details

MEASURE TYPE
Custom

MEASURE ID
CMAP001

MEASURE NAME
Chiller System Upgrade

SOURCE DESCRIPTION
CMAP001-01-1

USE CATEGORY
AP - Appliance or Plug Load

EFFECTIVE DATE
January 1, 2023

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Characterization
PDF

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Base Case Material Cost

Measure Case Material Cost

Base Case Labor Cost

Measure Case Labor Cost

Net-to-Gross

Gross Realization Rate (GRR)

Non-Energy Impacts

DEER Differences Analysis

Technology Summary

Cancel   SAVE CHANGES

B I | := := | Styles | Normal | Source

chillerWorkbook-002

Embedded calculation tool

Calculation tool embed button

Base users would see this view as read-only, with no edit functions

body   p

eTRM
OFFICIAL SOURCE
CA Energy Efficiency
Measure Data

Admin

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SIGN OUT

RELEASE ASSIGNMENT You are now assigned to this measure. No other user will be permitted to make edits until you release it.

DRAFT Dec 1, 2022 1:00 PM Version History Measure Log

Chiller System Upgrade

CHARACTERIZATION   DEPENDENCIES   SUPPORTING DATA   CALCULATIONS   PERMUTATIONS   SUBSCRIPTIONS

Measure Details

MEASURE TYPE
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MEASURE ID
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MEASURE NAME
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Characterization
PDF

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Technology Summary	Electric Savings (kWh)	Measure Case Labor Cost
Measure Case Description	Peak Electric Demand Reduction (kW)	Net-to-Gross
Base Case Description	Gas Savings (Therms)	Gross Realization Rate (GRR)
Code Requirements	Life Cycle	Non-Energy Impacts
Program Requirements	Base Case Material Cost	DEER Differences Analysis
Program Exclusions	Measure Case Material Cost	
Data Collection Requirements	Base Case Labor Cost	

Technology Summary

Chiller Workbook
XLSX / 12 MB : CALCULATION TOOL

Measure Case Description

Base Case Description

Building Permutations

eTRM
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CA Energy Efficiency Measure Data

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🔓 **RELEASE ASSIGNMENT**   *You are now assigned to this measure. No other user will be permitted to make edits until you release it.*

⚙ ▨▨▨ **DRAFT**   Dec 1, 2022 3:48 PM   **Version History**   **Measure Log**

Chiller System Upgrade

⚙

| ☰ CHARACTERIZATION | DEPENDENCIES | ☰ SUPPORTING DATA | ☰ CALCULATIONS | PERMUTATIONS | SUBSCRIPTIONS |

No permutations have been built for this measure.

CONFIGURE ✕

Configure fields

Custom Measures do not have Shared Reports, Custom Reports, Other Reports, or CET Integrations

Custom Measures are subject to a reduced data spec compliance requirement, which affects permutation configuration

Discussion topic:
View the Data Spec Fields file to verify the list of permutation configurations for custom measures

Chiller System Upgrade #CMAP001
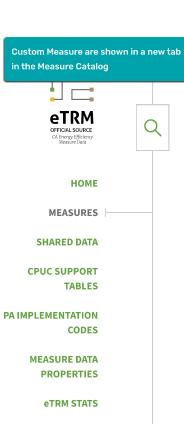
Data spec fields

Additional fields

PERMUTATION CHARACTERIZATION

FIRST BASE CASE DESCRIPTION (STRING)

Not mapped

Please refer to the functional spec for specifics of the permutation configuration options

SECOND BASE CASE DESCRIPTION (STRING)

Not mapped

MEASURE CASE DESCRIPTION (STRING)

Not mapped

EXISTING DESCRIPTION (STRING)

Not mapped

STANDARD DESCRIPTION (STRING)

Not mapped

COMMON MEASURE PARAMETERS

MEASURE APPLICATION TYPE (STRING)

Not mapped

BUILDING TYPE (STRING)

Save   Cancel   Delete

Custom Measures in the eTRM

Custom Measures appear in the Measure Catalog (new tab) and Search Results

Custom Measures
in the Measure Catalog

eTRM
OFFICIAL SOURCE
CA Energy Efficiency Measure Data

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Measure Catalog

DEEMED MEASURES   CUSTOM MEASURES   MEASURE REPORTS

Find by keyword...   🔍   **Add a Filter**

					Starting row	Rows per page	
⏮	◀	**1-5** of **5** measures	▶	⏭	1	25 ▾	Go

NAME ▲	MEASURE VERSION ID ⇅	TYPE ⇅	USE CATEGORY ⇅	PUBLISHED ⇅
Chiller System Upgrade	CMAP001-01	Custom	AP - Appliance or Plug Load	Dec 1, 2022
Custom Measure Name	CMAP002-01	Custom	AP - Appliance or Plug Load	Dec 5, 2022
Custom Measure Name	CMAP003-01	Custom	AP - Appliance or Plug Load	Dec 2, 2022
Custom Measure Name	CMAP004-01	Custom	AP - Appliance or Plug Load	Dec 1, 2022
Custom Measure Name	CMAP005-01	Custom	AP - Appliance or Plug Load	Dec 15, 2022

					Starting row	Rows per page	
⏮	◀	**1-5** of **5** measures	▶	⏭	1	25 ▾	Go

Custom Measures
in Search Results

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🔍 chiller

6 SEARCH RESULTS

|◄◄ ◄ **1–6** of **6** search results ► ►►|

📄 **SWHC052-01: Air-Cooled Chiller , Path B**

... chiller (s) to cool and distribute water that is used to cool air to meet building cooling demand. An air-cooled chiller rejects heat from the refrigeration cycle to the ambient air using fans (forced convection). Even though an air-cooled chiller is less efficient than a water-cooled chiller, it provides other advantages: lower first cost, lower maintenance ...

📄 **CMAP001-01: Chiller System Upgrade** ── Custom measure

... chiller (s) to cool and distribute water that is used to cool air to meet building cooling demand. An air-cooled chiller rejects heat from the refrigeration cycle to the ambient air using fans (forced convection). Even though an air-cooled chiller is less efficient than a water-cooled chiller, it provides other advantages: lower first cost, less complex ...

📄 **SWHC005-02: Water-Cooled Chiller**

... chiller are based on the unit operating under standard test conditions, normally determined by AHRI Standard 550/590 – 20163. Chillers have two different energy efficiency rated conditions: 1) full load efficiency (EER, kWh/ton) and 2) part load efficiency (integrated part load value (IPLV). The measure case is defined as a variable speed water-cooled chiller for use in nonresidential buildings ...

📄 **SWHC008-01: Variable Speed Drive for a Central Plant System**

... chiller and circulating this chilled water through a chilled water coil in an air handler or throughout the building zones. A chiller is either air-

Admin Functionality

Creating a Calculation Tool

eTRM Management

CONTENT

Measures

The primary object in eTRM, comprising all content needed to develop a regulated measure and build its permutations.

Manage measures

Manage archived measures

References

A library of authoritative information sources which can be cited by assorted objects throughout eTRM.

Manage references

Shared Parameters

Parameters are used to characterize individual measure permutations that qualify energy savings and (in some cases) costs. Shared parameters are those that are used by multiple measures in the eTRM.

Manage shared parameters
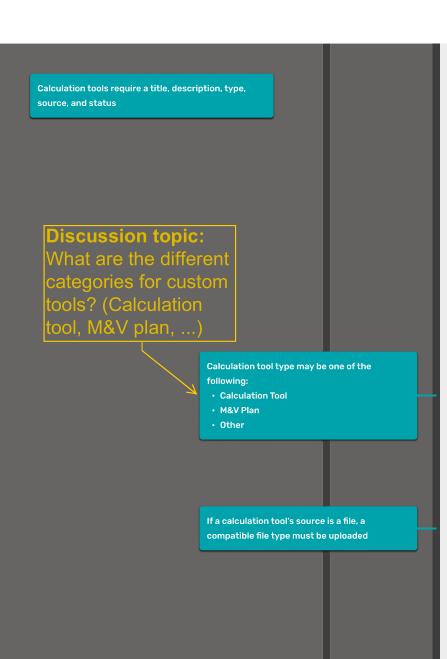
Shared Value Tables

Value tables are used to assign specific numeric values to equations as well as to define values relevant to measure tracking and reporting. Shared value tables are used by multiple measures in the eTRM.

Manage shared value tables

Calculation Tools

Calculation tools are files used to calculate savings in Custom Measures.

Manage calculation tools

Calculation tools require a title, description, type, source, and status

Discussion topic:
What are the different categories for custom tools? (Calculation tool, M&V plan, ...)

Calculation tool type may be one of the following:
- Calculation Tool
- M&V Plan
- Other

If a calculation tool's source is a file, a compatible file type must be uploaded

CREATE A NEW
Calculation Tool

TITLE *

Chiller Workbook

DESCRIPTION *

| B | I | :≡ | 1≡ | 🔗 | ✏ | Normal ▾ | I_x | 🔗 Source |

To be used in measures related to chiller system upgrades

body p

CALCULATION TOOL TYPE *

Calculation Tool ▾

SOURCE *

🔵 File Import

⚪ External Link

CHOOSE FILE TO IMPORT

Choose File   chiller_workbook.xlsx

Allowed file formats are: Excel (.xlsx, .xlsb, .xlsm), Word (.docx), ZIP, or PDF

STATUS *

CPUC Approved ▾

Save   Cancel

Discussion topic:
Will the list of deemed-workflow statuses cover all the cases for a custom tool?

Draft
CalTF Affirmation
POU Ready
CPUC Review
CPUC Approved

Calculation tools require a title, description, type, source, and status

Calculation Tool

TITLE*

Chiller Workbook

DESCRIPTION*

| **B** | *I* | :≡ | ≟ | 🔗 | ⬚ | Normal ▾ | _I_ₓ | ⟨⟩ Source |

To be used in measures related to chiller system upgrades

body p

CALCULATION TOOL TYPE*

Calculation Tool ▾

SOURCE*

○ File Import

● External Link

If a calculation tool's source is a link, the required information is a URL rather than a file

URL*

https://externalsource.com/path/to/calculation-tool.xlsx

STATUS*

CPUC Approved ▾

Save   Cancel

MANAGE

Calculation Tools

Create

🔍 Find...

TITLE	DESCRIPTION	TYPE	LAST UPDATED
P Boiler Load Balance and Scorecard Tool	Excel workbook to determine boiler load...	Calculation Tool	Jan 1, 2023
Chiller Workbook	To be used in measures related to chiller...	Calculation Tool	Jan 15, 2023
P DOE MEASUR Calculators	External weblink to DOE's suite of MEASU...	M&V Plan	Jan 5, 2023
P HVAC Tool	Excel workbook for calculating savings for...	Calculation Tool	Jan 1, 2023

Scorecard Tool

Chiller Workbook   VIEW   DELETE   ✕   in measures related to chiller...

P DOE MEASUR Calculators   External weblink to DOE's suite of MEASUR calculators

Creating a Custom Measure

Measure

A Custom Measure is created from the Admin panel in the the same way as a Deemed Measure

All measures will need to indicate their Measure Type, which is a choice of "Deemed" or "Custom"

All custom measures must have a Measure ID beginning with "CM"

Discussion Topic:
This 1st phase custom measures will have the prefix of "CM".

There is a future potential to add more measure types and prefixes, such as NMEC

Basic

MEASURE TYPE*

Custom

NAME*

Chiller System Upgrade

MEASURE ID*

CMAP001

USE CATEGORY*

AP - Appliance or Plug Load

EFFECTIVE DATE*

2022-12-17

END DATE

Save   Cancel