

Technical Forum Meeting



CALIFORNIA
TECHNICAL FORUM

JULY 27, 2023
LOS ANGELES

Cal TF will record the meeting for notetaking purposes

Morning Agenda

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Time (PST)	Agenda Item & Action	Discussion Leader(s)
10:00 – 10:30 (30 min)	Agenda Review and Quick Updates <ul style="list-style-type: none"> • New TF members • 2023 TF Calendar Updates • Communication Plan Updates (3C) • Measure Property Data Update 	Ayad Al-Shaikh
10:30 – 11:45 (45 min)	Custom Initiative Overview and Updates <ul style="list-style-type: none"> • Custom 2023 Workplan Overview/Updates • Custom Roadmap Overview 	Arlis Reynolds
10:45 – 11:30 (45 min)	Custom Measures Prioritization (5A-3) ACT: TF input on priority measures for SW hybrid and custom development	Arlis Reynolds
11:30 – 12:30 (60 min)	Custom Measure Characterization: Steam Boiler <ul style="list-style-type: none"> • Measure Characterization • Measure Tools ACT: TF Affirmation of Steam Boiler Characterizations	Spencer Lipp and Steven Long
12:30 – 1:15	Lunch	n/a
1:15 – 2:00 (45 min)	Custom Policy Review (5A-1) ACT: TF input on policy resources, communication, and recommendations	Arlis Reynolds

Cal TF will record the meeting for notetaking purposes

Afternoon Agenda

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Time (PST)	Agenda Item & Action	Discussion Leader(s)
2:00 – 2:30 (30 min)	Custom Measure Package and Tool Development Workflow (5C-2) ACT: TF input on draft CMP develop/update proposal	Arlis Reynolds
2:30 – 2:45	Break	n/a
2:45 – 3:30 (45 min)	Custom Tools Library (5A-4) ACT: TF input on priority tools for updating and development	Spencer Lipp
3:30 – 4:00 (30 min)	Other Custom Measure Characterizations (5C-1) <ul style="list-style-type: none">• HVAC Retrocommissioning• Chiller Systems Upgrade ACT: Cal TF input on measure types/scenarios; technical approach; data requirements	Spencer Lipp
4:00	Closing and Next Steps	Ayad-Al Shaikh
4:00+	No-host happy hour at: Arts District Brewing Company (828 Traction Ave, Los Angeles, CA 90013)	n/a

Cal TF will record the meeting for notetaking purposes

Quick Updates

- New TF Members
- TF Calendar Check-In
- Other Business Plan Updates
 - Communication plan meeting (ongoing)
 - Measure Property Data

New TF Members

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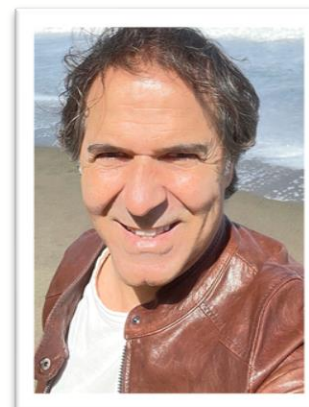
Babak Yazdanpanah
LADWP



Tim Olsen
The Energy Coalition



Michael Green
Willdan



Antonio Aliberti
Cascade Energy

TF Calendar Check-In

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- August – no meeting
- September 28 – Data Charette, Part 2
 - PG&E HQ, Oakland
- October 26
 - SoCalGas Energy Research Center, Downey
 - Optional tours of SoCalGas demonstrations
- November 16
 - Remote
- December 14
 - LACI, Los Angeles



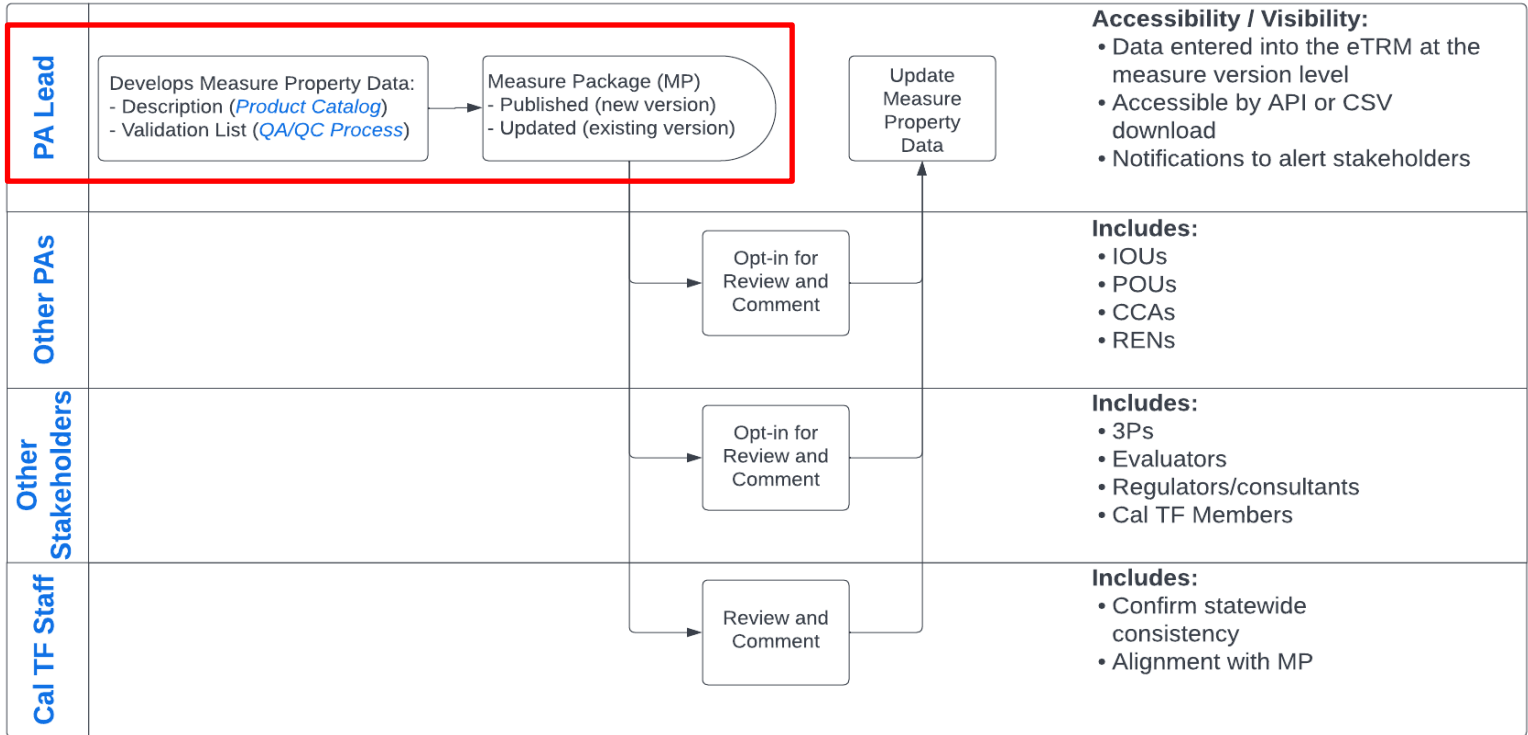
Measure Package Communication and Versioning Plan (3C)

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- Stakeholder outreach (*blue italics - conducted through May*)
 - IOUs
 - ✦ *PG&E*
 - ✦ SCE
 - ✦ SDG&E
 - ✦ SCG
 - POUs
 - ✦ *LADWP*
 - ✦ NCPA / SCPPA
 - CPUC / EAR Team
 - Evaluators
 - ✦ DNV
 - ✦ Quantum
 - Implementers
 - ✦ *Energy Solutions*
 - ✦ *Cascade*
 - ✦ TRC
 - ✦ Willdan
 - ✦ AESC
 - Implementers (cont)
 - ✦ Synergy
 - ✦ ERI
 - ✦ CLEAResult
 - ✦ Frontier
 - ✦ *RMS*
 - ✦ Ecology Action
 - ✦ ICF
 - ✦ Lincus/Solaris
- Enhancement Development
 - 2023 – Business and Functional Requirements
 - 2024 – Enhancement Implementation

Next Steps: *Draft* Statewide Process

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First end-use category of measures for external QC will be HVAC

- You will be invited to review the data if you have been part of the subcommittee process so far.
- Reach out to Ayad (ayad.al-shaikh@futee.biz) if you want to get involved but have not been yet.



ISP White Paper – Survey



- Goal
 - Collect stakeholder input on “current state,” existing challenges, and potential improvements
- Audience
 - Stakeholders who have experience in the development and/or review of an Informal ISP Study in the last three years
- Timing
 - Released July 17
 - **Respond by August 9**
 - Allow at least 30 mins to respond
- Survey Link
 - https://www.surveymonkey.com/r/CalTF_ISP_Survey

BP Metric 5X

Custom Initiative
(includes all metrics in
BP Goal 5)

- Custom Initiative Workplan
 - Affirmed by TF in April 2023
- Custom Subcommittee
 - Meets monthly on 1st Wednesdays
 - Measure Subgroups
 - ISP Working Group
- Custom SharePoint Site
- Contact arlis.reynolds@futee.biz for SharePoint access, meeting invites, etc.

Definitions

- **Custom Measure**
 - Any EE measure that is not deemed
 - Requires site-specific data to estimate/validate savings

- **Custom Tool**
 - Any tool used to calculate energy savings and/or other key parameters for a custom measure
 - Example: PG&E HVAC Tool, EnergyPlus

- **Custom Measure Characterization (CMC)**
 - Comparable to Deemed Measure Characterization
 - Description of measure, eligibility requirements, savings calculation methods, data collection and M&V requirements for a defined measure or measure group
 - Developed using Statewide Custom Measure Characterization Template
 - Methods/approach are encouraged; not mandatory

- **Custom Measure Package (CMP)**
 - Comparable to Deemed Measure Package
 - Combination of Custom Measure Characterization and any supporting Tools, References, and other Resource

Workplan Overview/Updates

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Metric	Activity/Task	Status Update	Upcoming
5X	Custom Initiative Workplan	Complete (Affirmed by TF, PAC in April)	-
5A-1	Regulatory Summary & Review	Discussing library and recommendations today	Request for stakeholder input to complete library of resources/guidance, identify questions/challenges
5A-2	SW Custom Measure ID	Cal TF Staff updates proposed based on stakeholder input	Updated SW Measure Code Structure (September)
5A-3	List of Measures for SW Custom Measure Packages	Cal TF Staff compiling measure list	Stakeholder input to identify/prioritize measures for SW standardization
5A-4	List of Custom Tools	Stakeholder input to prioritize tools for updating and development by Jul 28	-
5B	Custom Roadmap	Cal TF Staff drafting based on stakeholder input to date	Stakeholder input to identify/prioritize needs/efforts for Roadmap
5C-1	SW Measure Characterization	Steam Boiler MP final draft for TF review/affirmation	TF affirmation of Steam Boiler CMC (July) Stakeholder review of RCx
5C-2	Custom MP and Tool Development Workflow	Stakeholder review/discussion of proposed SW process	-
5D	eTRM Documentation	Custom Measure Characterization template	TBD based on eTRM implementation
5E-1	eTRM Custom Phase 1	Complete (Custom Library scheduled for 2024 Q1)	-
5E-2	Future Custom eTRM Modules	Discussing disposition database and CMPA	eTRM 101 Training
6B	White Paper: ISP	Stakeholder Survey, complete by July 28	-

Blue text = status updates

Highlight = current/upcoming stakeholder input

Custom Working Groups

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- Custom Subcommittee
 - General updates/discussion on Work Plan activities
 - Meets monthly on 1st Wednesdays, 1-3pm (remote)

- Active Working Groups
 - Measure Subgroups
 - ✦ Develop Custom Measure Characterizations for selected measure types
 - ✦ Meetings vary based on membership (typically 1hr, biweekly)
 - ✦ Steam Boiler, HVAC RCx, Chiller Systems, Pump Systems
 - Industry Standard Practice
 - ✦ Research & analysis to support Cal TF White Paper on ISP
 - ✦ Meets weekly on Mondays, 11am

- TBD Future Working Groups
 - Policy Review
 - Tool Subgroups
 - eTRM Custom Modules

5-year Roadmap

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- BP Metric 8A. Develop 5-year Roadmap that identifies core Cal TF/eTRM activities, new strategic initiatives, and desired success factors. Roadmap will identify coordination needs and leveraging opportunities to achieve desired outcomes.

February 2023 –
PAC Brainstorm

June 2023 – Draft
Roadmap

September 2023 –
Final Roadmap

April 2023 – PAC
Discussions

Q3 2023 –
Stakeholder Input

Custom Roadmap Overview

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Centralize/organize regulatory guidance

Publicly-accessible library of custom policy and guidance materials

eTRM Dispositions

Notification strategy to improve all stakeholder awareness and understanding of new/updated policy and resources

Identify, Consolidate, and Develop SW custom measures & tools

Statewide Custom Measure Packages

Statewide Custom Tool Library

Manage/update Custom Measure Packages and Tools as needed

Identify and Develop Hybrid measures

Statewide Hybrid Measures and calculation tools

Streamlined pathway for Hybrid measure review

Add Custom measures and tools in the eTRM

eTRM Custom Library

eTRM Module for Custom Measure Packages

eTRM Module for Hybrid measure calculations

Develop and review custom projects in eTRM

eTRM Module for project measures and custom projects

eTRM hosts custom measures, projects, and review information

Perform centralized technical project review/QA

Statewide standard technical review templates and process

Custom projects hosted in central, access-controlled location

Cal TF perform technical review

Automated review and compilation of technical review findings and outcomes

Metric 5A-3

List of Measures for Statewide Methods

- **Objective**
 - Identify and prioritize custom measures for statewide standardization and hybrid methods

- **Approach**
 - Identify common custom measures
 - ✦ Custom program activity and claims data
 - ✦ Existing methods guidance documents
 - ✦ Stakeholder input on potential new custom measures
 - Identify “hybrid” opportunities
 - Prioritize measures for statewide development

- **Deliverables**
 - List of custom measures recommended for SW standard and/or hybrid methods

EE Measure Classification

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White Paper: Energy Efficiency Measure Classification

Version 1.0
December 7, 2020



Prepared by Cal TF Staff:
Stefano Gallasso
Ayad Al-Shaikh
Jennifer Holmes

[Cal TF White Paper: EE Measure Classification](#)

Measure Types

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How a measure is classified has implications for **implementers** (ease and usability of a measure), **customers** (speed of project development/certainty of savings/certainty of incentive), **program administrators** (ex post evaluation risk, review, and claims process), and the **regulatory approval** process.

Deemed

“per-unit impacts and costs have been pre-determined” (and pre-approved by CPUC for use in IOU programs)

"Hybrid"

The savings estimation algorithm of is pre-established and approved, but site-specific data is collected for select parameters that account for most of the variation in savings

("Semi-deemed", "Semi-custom" for POUs, other jurisdictions; not an official measure type for CPUC programs

Custom

“customer financial incentive and the ex-ante energy savings are determined using a site-specific analysis of the customer’s facility.”

Hybrid Measure Type

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- “semi-deemed” , “Semi-custom” , “custom-calculated”
- Definition
 - The savings estimation algorithm of a hybrid measure is deemed (i.e., pre-established and approved) and site-specific data is collected for select parameters that account for most of the variation in savings
- Advantages
 - **Greater customer certainty** of requirements, application timeline, and incentives than custom measures.
 - **Streamlined, shorter approval process**, similar to deemed measures.
 - Greater simplicity than custom measures and greater accuracy than deemed measures in savings and/or cost estimates.
 - **More limited in-situ field verification requirements** or a pre-defined site-verification plan that clearly identifies the inputs that require field verification.

Custom Measures

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- Cal TF White Paper: “The custom program is best suited for **unique or low volume** energy efficiency measures that generate a **sufficient amount of savings** to warrant the additional site-specific data collection.”
- Low volume: < 10/year for COM; < 50/year for RES
- Sufficient Savings: what is it?

HYBRID measures?

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- What makes a good candidate for hybrid approach?
 - Common engineering approach / calculation method
 - High volume (to warrant effort)
- What measures (that currently go custom) are good candidates for hybrid approach?
- What new measures are possible with a “hybrid” and/or streamlined approach? (E.g., measures not pursued due to current cost processes)

Next Steps

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- Next Steps
 - Create full measure list (existing and new measures)
 - Categorize new measures as deemed, “hybrid”, custom
 - Prioritize deemed, hybrid measures for statewide development
 - Develop “hybrid” proposal (e.g., streamlined pathway for hybrid/semi-deemed measures)

- Other thoughts?

Metric 5A-4

List of Custom Tools

- **Objective**
 - Identify and characterize custom tools that stakeholders may use to develop custom projects

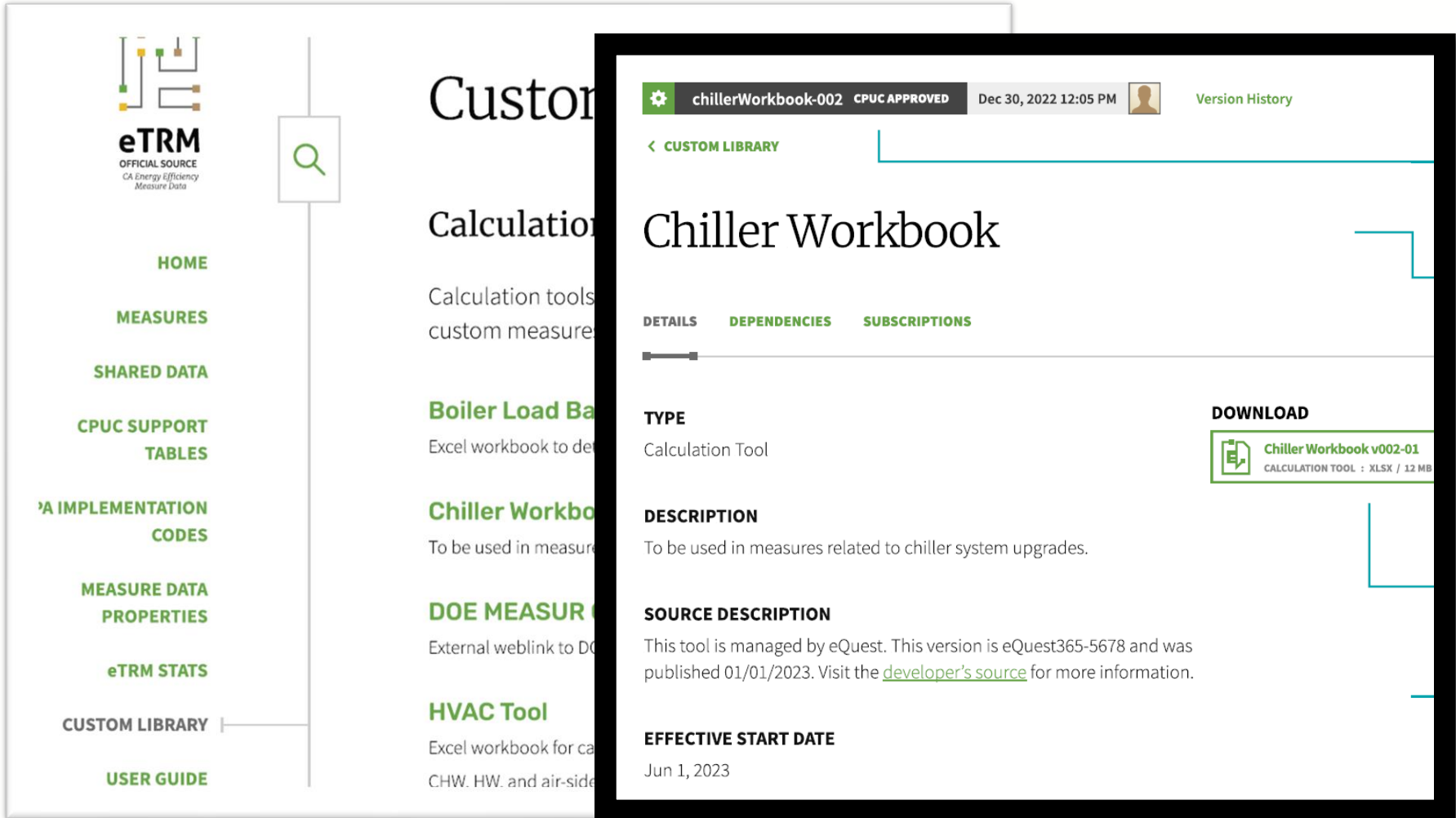
- **Approach**
 - Identify and gather existing tools
 - Need support from CPUC, IOUs, implementers to identify/access
 - Characterize tools (e.g., use, status)
 - Identify and prioritize needs to improve the library of useful tools

- **Deliverables**
 - List of characterized custom tools used in past five years.
 - Public library of custom tools with summary information
 - Prioritized list of needs to update, seek approval, and/or develop new custom tools.



eTRM Custom Library

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The screenshot displays the eTRM Custom Library interface. On the left is a sidebar with navigation links: HOME, MEASURES, SHARED DATA, CPUC SUPPORT TABLES, A IMPLEMENTATION CODES, MEASURE DATA PROPERTIES, eTRM STATS, CUSTOM LIBRARY (highlighted), and USER GUIDE. The main content area shows a list of calculation tools, including 'Boiler Load Balance', 'Chiller Workbook', 'DOE MEASUREMENT', and 'HVAC Tool'. A modal window is open over the 'Chiller Workbook' tool, showing its details.

Custom

Calculation

Calculation tools
custom measure

Boiler Load Balance
Excel workbook to de

Chiller Workbook
To be used in measur

DOE MEASUREMENT
External weblink to DO

HVAC Tool
Excel workbook for ca
CHW, HW, and air-side

Chiller Workbook

chillerWorkbook-002 CPUC APPROVED Dec 30, 2022 12:05 PM Version History

< CUSTOM LIBRARY

DETAILS DEPENDENCIES SUBSCRIPTIONS

TYPE
Calculation Tool

DESCRIPTION
To be used in measures related to chiller system upgrades.

SOURCE DESCRIPTION
This tool is managed by eQuest. This version is eQuest365-5678 and was published 01/01/2023. Visit the [developer's source](#) for more information.

EFFECTIVE START DATE
Jun 1, 2023

DOWNLOAD
Chiller Workbook v002-01
CALCULATION TOOL : XLSX / 12 MB

List of Custom Tools (5A-4)

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- Tool sources (175 total)
 - CPUC/IOU Custom Tool Archive (CTA)
 - Custom Subcommittee Tools List
 - 2013 Customized Calculation Tool
 - CPUC Custom Team input
 - POU Measure Workbooks
- Characterized list
 - Categorized by end-use or activity
 - Assessed each tool for inclusion in library
- Cal TF Staff Assessment
 - Unique
 - Unknown
 - CCT
 - Removed
 - POU Removed
 - POU Unique

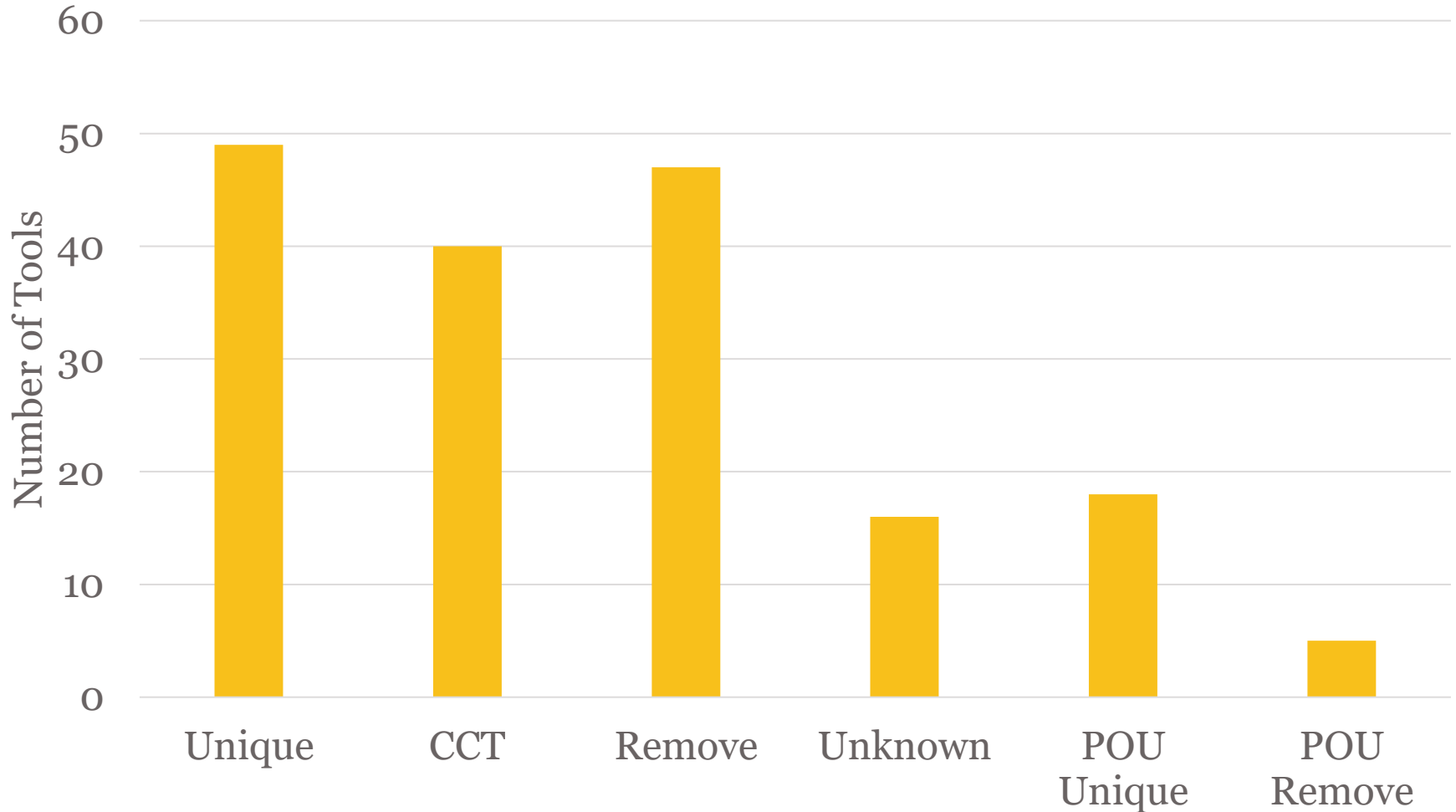
Custom Tools Questionnaire

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- Questionnaire due 7/28/23
 - Estimate 1-2 hours to complete
 - 3 input tabs
- Stakeholder input
 - Specific questions
 - Recent use in approved project
 - Rating in interest for prioritization
 - Updates needed?
 - ✦ Baselines
 - ✦ Policy updates
 - ✦ Calculation assumptions
 - ✦ Other

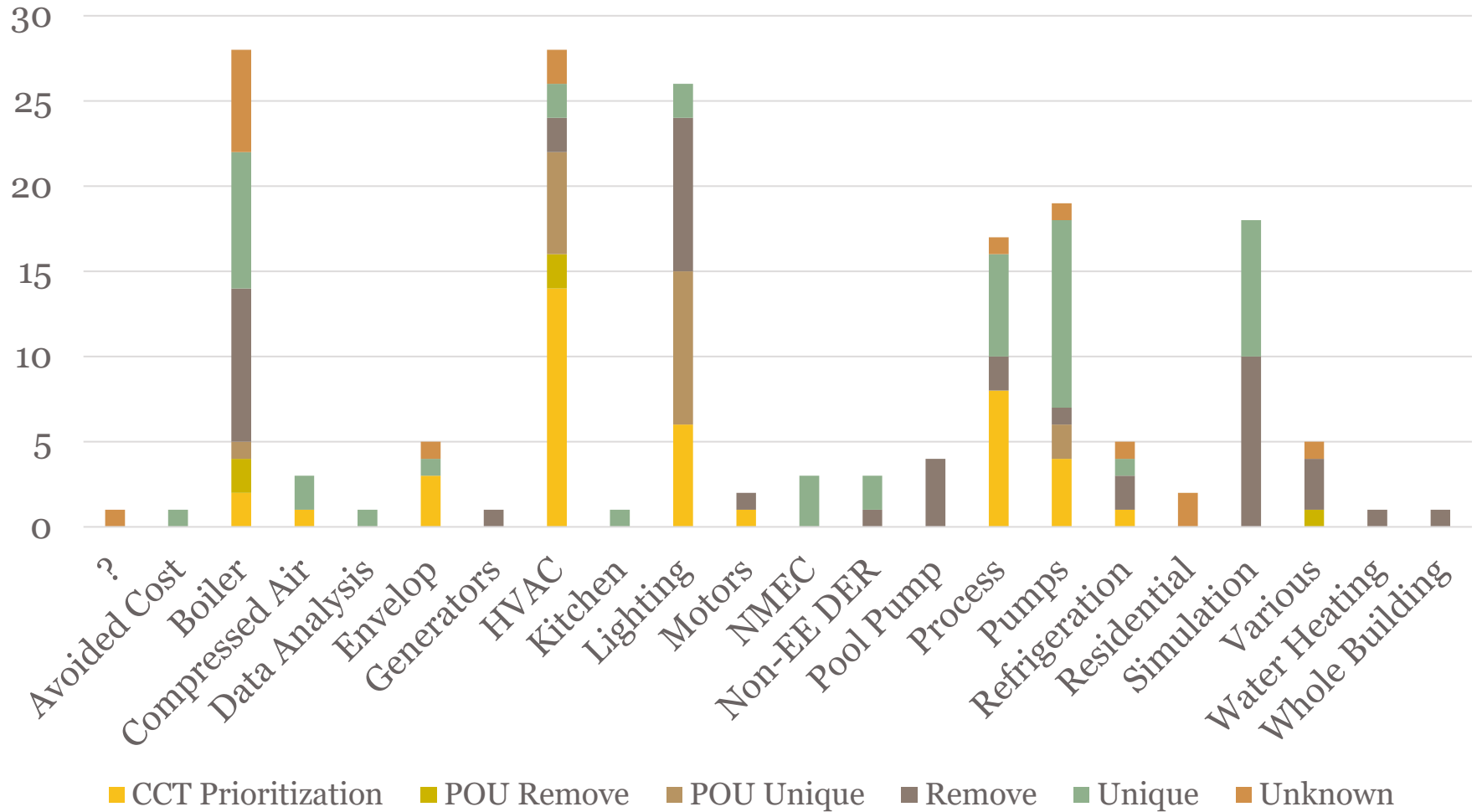
Custom Tool Categorization

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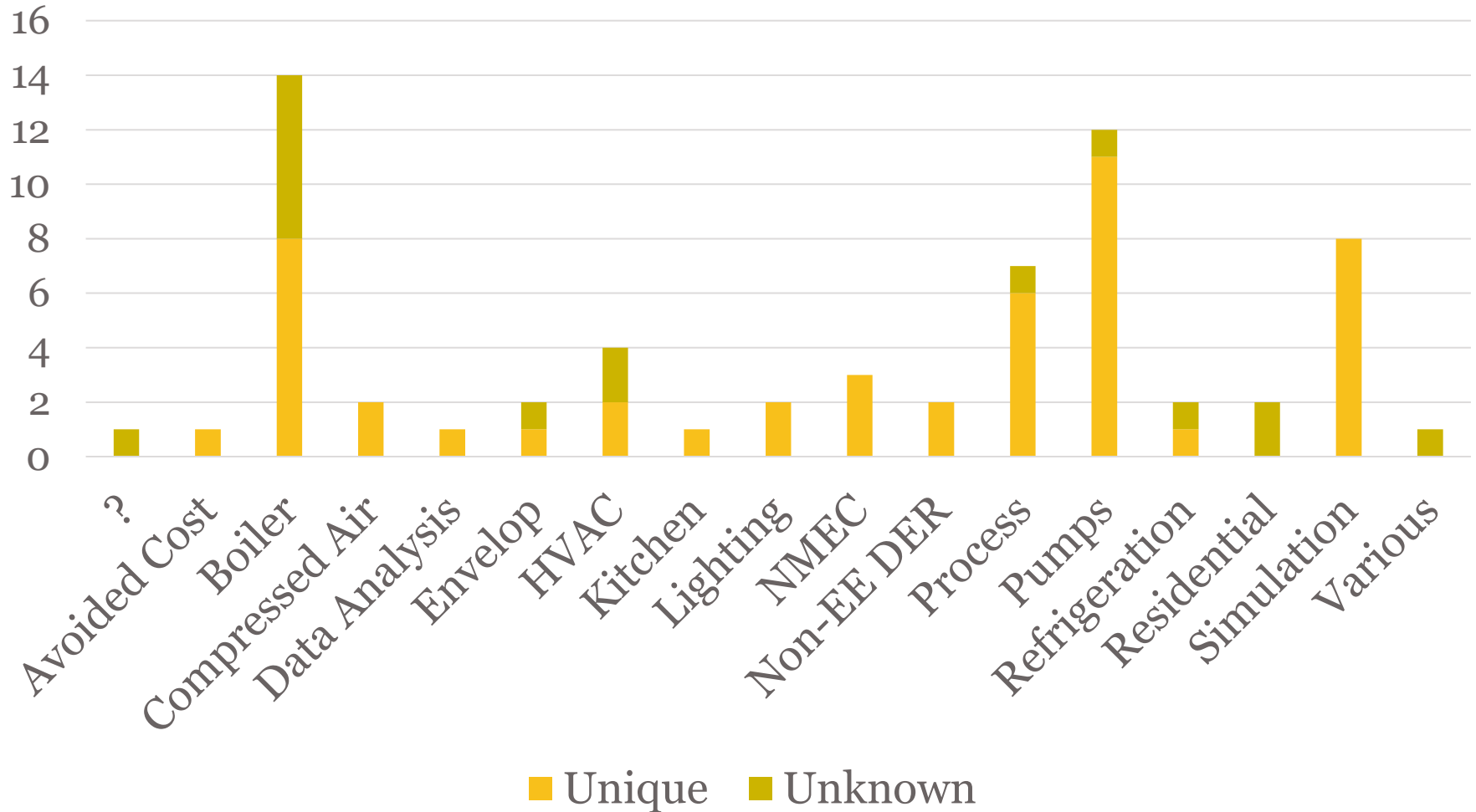
Custom Tool Categorization by End Use

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Unique and Unknown Tools by End Use

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Boiler Systems Unique/Unknown Tools

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Is anyone familiar with this tool?

Boiler CEC Tool	Classification	Description
CEC- Available Heat	Unknown	Calculates the available heat of an equipment that has a specified natural gas composition and a flue gas measurement
CEC- Recover heat from boiler blowdown water	Unique	Calculates the amount of energy that can be conserved using a heat exchanger on the blowdown line to preheat makeup water
CEC- Monitor and control lower explosive or flammability limit	Unique	Calculates energy savings by increasing the LEL limit via excess air reduction or LEL monitoring equipment
CEC- Use preheated combustion air for burners	Unique	Calculates energy savings by using waste heat from the flue gas to preheat combustion air
CEC- Reduce boiler blowdown water	Unique	Calculates energy savings by reducing the blowdown rate from a steam boiler
CEC- Control air-fuel ratio	Unique	Calculates energy savings by reducing the excess air amount in the flue gasses of a steam or process heating unit

Boiler Systems Unique/Unknown Tools

Boiler SCG Tool	Is a complete overlap with deemed SWPR07?	Description
SoCalGas - Excess Tool	Is a complete overlap with deemed SWPR07?	Calculates energy savings by reducing the excess air (or oxygen level) in the flue gasses of a steam or process heating unit.
SoCalGas - Heat Recovery Tool	Unknown	Energy savings calculators for heat exchangers for the following scenarios: flue gas to combustion air preheat, flue gas to water preheat, flue gas to air, and water to water
SoCalGas - Load Balance Tool	Are steam traps an eligible measure?	Uses information on natural gas consuming equipment (connected load, hours of operation, and load factor) monthly gas bills to determine approximate annual gas consumption levels per equipment
SoCalGas - Steam Trap Tool	Does this use 3E+ methods or a different method?	Calculates annual natural gas energy savings for replacing failed steam traps
SoCalGas Pipe Insulation Calculator	Does this use 3E+ methods or a different method?	No description in CTA. Cal TF Staff is unclear how/if this relates to 3E+.

Boiler Systems Unique/Unknown Tools

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Boiler Tools	Categorization	Description
3E-Plus	Unique	Pipe and tank insulation heat loss calculator supported by DOE. Note – more than a boiler tool.
Hot Water Nozzle Tool	Unknown	Calculates the efficiency of upgraded sanitation nozzles measure. Considers electrical, Boiler and nozzle performance.
yyy Oil Refinery Boiler Replacement	Unknown	Identified from Cal TF hybrid subcommittee. No other information available.

Anyone familiar with this tool?

RSG Pumps Unique/Unknown Tools

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- Pump tools from Resource Solutions Group (RSG)
 - POC for Rod Beam Pump Tool
 - Rod Beam Pump VSD
 - Facility Centrifugal Pump VSD
 - Facility Positive Displacement Pump VSD
 - Gas Compressor Pump VSD
 - Water Shutoff Tool
 - Well Conversion Rod Beam PC Pump
 - Well Conversion Rod Beam Rotaflex Pump

Pumps Unique/Unknown Tools

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Pump Tools	Categorization	Description
ATS Pumps & Motor PSESC (general curve) Tool	Unique	Uses generic pump curves to calculate pump energy savings (from efficiency and VFD controls upgrades). Baseline control scheme is either on/off or throttling
SCE Pump Test Tool	Unique	Pumping Upgrades; Applicable only for SCE's Pump Tests.
Pump Overhaul Billing Reconciliation Calculator	Unknown	This SCE tool is used to reconcile the hours of operation billed to the individual pump when more than one pump is connected to the billing.
Pump OPE Tool (Exception Package Spreadsheet)	Unique	This tool is used to determine Overall Pumping Plant Efficiency (OPE) when SCE can't determine OPE or there are special conditions beyond what we can explain using the pump test system only.

Simulation Unique/Unknown Tools

Simulation Tools	Categorization	Description
eQuest	Unique	Whole building energy simulation tool based on DOE.2 for commercial buildings.
DOE2.2R	Unique	Whole building energy simulation tool specifically designed for refrigeration systems.
TRACE 700	Unique	Whole building energy simulation tool developed by Trane for commercial buildings.
OpenStudio	Unique	Collection of software tools to support whole building energy modeling using EnergyPlus
Energy Pro Lite (EPL) v 4	Unique	Streamlined version of EnergyPro 5 for modeling of existing multifamily buildings and energy efficiency or electrification upgrades.
Energy Plus v23.1	Unique	Open source whole building energy modeling program.
MASControl	Unique	Tool to run multiple simulations using DEER prototype buildings.
EnergyPro v9.1	Unique	Building simulation program for performance based (multiple measure) commercial projects.

Process Unique/Unknown Tools

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Process Tools	Categorization	Description
CEC - Control humidity for a dryer	Unique	Calculates energy savings due to an increase in the humidity levels within a dryer.
CEC- Preheat loads using heat from exhaust gasses	Unique	Calculates energy savings by preheating material prior to loading into a heating unit.
SoCalGas - Furnace Tool	<div style="border: 1px dashed black; padding: 5px; display: inline-block;"> There is an old ISP study. Is this an eligible measure? </div>	Calculators included are Oxygen Enrichment, Moisture Reduction, Wall Loss Reduction, Minimum Preheat, Steel Preheat, and Fixture Light Reduction
SoCalGas - Like to Like Tool		For similar pieces of equipment that have different efficiencies or energy intensities
SoCalGas - Thermal Oxidizer Tool	Unknown	Energy calculator for different types of thermal oxidizer systems
BioWIN	Unique	Wastewater treatment process simulator that ties together biological, chemical, and physical process models
MEASUR	Unique	DOE consolidated tool

HVAC Unique/Unknown Tools

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HVAC Tools	Categorization	Description
HVAC Tool	<div data-bbox="633 392 1016 622" style="border: 1px dashed black; padding: 5px; display: inline-block;"> Are these tools up to date? </div>	Source Solutions Group tool for School Energy Efficiency Program.
Aircuity Tool	Unknown	Vendor tool calculating savings for the installation of the Optinet control system on laboratory ventilation systems.
(PG&E) HVAC-Standard_Tool	Unique	PG&E calculation tool covers RCx, chilled water plant, hot water plant, retrofit EE, and air-side system measures
DEER2020 Chiller Workbook	Unique	CPUC developed chiller replacement savings calculator. Currently being updated.

NMEC Unique/Unknown Tools

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Based on the description appears to be an NMEC tool. Anyone familiar?

NMEC Tools		Description
Energy Explorer (SDG&E)	Unique	Models facility energy use using mean, median, simple and multiple-linear regressions and specially-developed 2, 3, 4 and 5- parameter change-point models allow the user to precisely quantify relationships between building energy use, weather, and other energy drivers.
NMEC-R	Unique	Open-source R package that employs multivariable linear regressions, time of week, temperature & time of week, HDD, CDD, and HDD & CDD models.
LBNL RMV 2.0	Unique	Open-source R package for performing advanced measurement and verification 2.0

Lighting Unique/Unknown Tools

Lighting Tools	Categorization	Description
(PG&E) Grow_Green_Calculator _Horticulture_Lighting	Unique	Horticulture LED lighting tool.
MLC V13.1.2	Unique	Current SW tool for custom, non-horticulture lighting efficiency and controls measures.

Is this being updated with the latest ISP?

Refrigeration Unique/Unknown Tools

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Refrigeration Tools	What measures does this include?	Description
Super Market Tool (SCE)	Unknown	Calculate energy savings in small-medium refrigerated spaces
(PG&E) Refrigeration-Standard Tool	Unique	Calculation tool covers: <ul style="list-style-type: none"> a. Reduce Condensing Temperature b. Condenser VFD c. Floating Head Pressure d. Increase Suction Pressure e. Compressor Stating Optimization f. Compressor VFD g. Evaporator VFD

Is this being updated similarly as the HVAC tool?

Residential Unique/Unknown Tools

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Residential Tools	Categorization	Description
EUCA Measure Package Energy Saving Calculator (SCE)	Unknown	Energy Upgrade California tool based on eQuest simulations
EUC tools (PG&E)	Unknown	This calculator estimates the energy savings that will result from home upgrade packages completed under the Energy Upgrade California program.

For both, are these the same tool? Are these custom, deemed, or both?

Envelope Unique/Unknown Tools

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Envelope Tools	Categorization	Description
CEC- Minimize wall surface heat losses	Unique	Calculates energy savings by reducing the wall temperature of a heating unit.
Solar Heat Gain through Windows	Unknown	Used to calculate total BTU/day for each month due to south facing 90 deg tilt windows

Non-EE DER Unique/Unknown Tools

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Non-EE DER Tools	Categorization	Description
PV Watts	Unique	Used to estimate hourly power production for commercial new construction projects with TMY2, TMY3, or International weather data files.
REopt Lite	Unique	Used to find the maximum optimal solar PV and/or battery storage system given a facilities energy consumption, demand and available area.

Is there benefit to having these tools in the library?

Miscellaneous Unique/Unknown Tools

Misc. Tools	Categorization	Description
CEC- Eliminate or reduce opening heat loss	Unknown	Calculates energy savings by reducing or eliminating the energy losses through openings
Kitchen Vent Hood Calculators	Unique	Used to evaluate the heating and cooling load and make up air for kitchen and dining areas.
ASD Fan and Pump Calc (PG&E)	Unknown	Used to calculate energy savings for pump and fan applications
The Universal Translator, Version 3 (UT3)	Unique	Data analysis support tool with modules that help to identify some deficiencies in operation such as economizer functionality and set points. It also has statistical modules to build regressions and psychrometric calculator
RACC Workbook for Deemed/Custom Measures	Unique	CPUC refrigerant leakage avoided cost calculator.

CCT Modules – Deemed Overlap

CCT Module	SW WP Number	SW WP Description
Replacement of Split/Package AC	SWHC013	Commercial unitary air conditioner
Replacement of Split/Package HP	SWHC013	Commercial unitary air conditioner
Supply fan motor VSD or VAV retrofit	SWHC018	VSD for HVAC fan controls
Demand control ventilation (DCV)	SWHC006 SWHC023	Single Zone DCV Enhanced ventilation for package AC
Variable flow chilled and hot water loops	SWHC008	Variable speed drive for central plant system
Natural gas boiler measure	SWHC004 SWWH008	Space heating boiler Process boiler
Steam trap replacement	SWPR003	Commercial steam trap

CCT Modules – Not Recommended

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- HVAC Tool Overlap
 - High efficiency chiller
 - VSD on centrifugal chiller
 - Water source HP
 - Air-side economizer
 - Chilled/hot water reset
 - T-stat adjustment/setback
 - HVAC Timeclocks
- MLC Overlap
 - Dimmable ballast
 - Indoor lighting by fixture type
 - Lighting controls
 - Lighting retrofit
 - Timeclocks for indoor lighting

CCT Modules – Not Recommended

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- DOE MEASUR Overlap
 - Compressed air system upgrades
 - High efficiency motors
 - Pumping system upgrades
- Small opportunity
 - Windows for daylighting
 - Roof and ceiling insulation
 - Low solar heat gain coefficient windows
- Eligibility concerns
 - Thermal oxidizer upgrades
 - Parking garage CO sensors
 - Skylights for daylighting

Potential CCT Modules for Consideration

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Measure	Weather	DEER Peak	Baseline	Policy	Calcs/ Assumption
Rapid cold storage doors	Update	Update			
Cooling tower fan VFD	Update	Update	Update		
Water-side economizer	Update	Update			
Process fan VFD		Update			
Injection molding machines		Update	Update	Update	
Professional wet cleaning		Update			Update

Potential CCT Modules for Consideration

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Measure	Weather	DEER Peak	Baseline	Policy	Calcs/ Assumption
Pulse Cooling for Injection Molding Machines		Update			
Tape Drip Irrigation		Update		Update	
VSDs for Dairy Vacuum Pumps		Update			
VSDs for Process Applications		Update			
Wastewater Retro commissioning (RCx)		Update			

Tool Maintenance Process

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- Updates for discussion
 - When?
 - ✦ Triggers may be dependent on measure

 - How?
 - ✦ Ownership and responsibility
 - ✦ Approvals

LUNCH
12:45 – 1:30

Metric 5A-1

Custom Regulatory Summary Review

- **Objective**
 - Summarize the sources and scope of existing custom regulatory guidance
 - Develop recommendations to improve access and clarity for all stakeholders
- **Approach**
 - Gather and summarize existing resources
 - Characterize resources (e.g., accessibility, update status, update frequency, clarity, and usefulness)
 - Identify potential overlap, conflicts
 - Develop, prioritize recommendations
 - **ADD: Detailed Policy Review**
- **Deliverables**
 - Summary of custom regulatory resources, policy, and guidance resources
 - ✦ [Custom Resources Workbook](#) (in progress)
 - ✦ [Custom Policy Materials](#) (in progress)
 - Proposal to improve approach to summarizing and providing clear guidance on custom measures, projects, and tools.

Custom Resource List and Library

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- Custom Resources Workbook
 - Resource Types
 - Resource Locations
 - Resource List

- Custom Policy Materials
 - SharePoint Document Library (future eTRM library)
 - All materials in the Custom Resource List
 - Goal: Central, accessible, “one-stop-shop” for custom policy, guidance, resources

Custom Resources

Resource Types

Document Type	Includes policy or guidance	PII Flag	Public	Available
CA Legislation	Yes	n/a	Yes	Yes
CPUC Decisions and Resolutions	Yes	n/a	Yes	Yes
CPR Public Tracker	Yes	n/a	Yes	Yes
CPUC Guidance Document	Yes	n/a	Yes	Partial
CPUC Guidance Memo	Yes	n/a	Yes	Partial
CPUC Pilot Document	Yes	n/a	Yes	Partial
Market-Based ISP Study	Yes	n/a	Yes	Partial
CPR Dispositions (redacted)	Yes	n/a	Yes	Partial
PA-Specific Resources	Yes	n/a	Partial	Partial
Informal ISP Study (with CPUC Disposition)	Yes	may include PII	Partial	No
Early Opinion	Yes	may include PII	Partial	No
CPR Dispositions	Yes	may include PII	No	No
CPUC/PA Meetings; Bi-weekly meeting notes	Yes	may include PII	No	No
Deemed Documentation	Maybe	n/a	Yes	Yes
Evaluation Report	Maybe	may include PII	Partial	Partial
CPUC Ad Hoc Communication	Maybe	may include PII	No	No
CPUC Publication	No	n/a	Yes	Yes
Efficiency Savings and Performance Incentive (ESPI) Memos	No	n/a	Yes	Yes
CPUC White Paper	No	n/a	Yes	Partial
Stakeholder Working Group Materials	No	n/a	Partial	Partial
PA Memos	No	n/a	Partial	Partial
Custom Tool Archive (CTA)	No	n/a	No	No

Q: Are there other resource types we should be looking for?

Custom Resources

Resource Locations

Owner	Resource Location	Weblink	Descriptions	Public
CPUC	CPUC Website: Energy Efficiency	Energy Efficiency (ca.gov)	CPUC webpage with information/resources related to Energy Efficiency	Y
CPUC	CPUC Website: EE Baselines	Energy Efficiency Baselines (ca.gov)	CPUC webpage with information/resources related to appropriate Energy Efficiency baselines	Y
CPUC	CPUC Website: CPR Home Page	Custom Projects Review Home Page (ca.gov)	CPUC webpage with information about the custom programs	Y
CPUC	CPUC Website: CPR Guidance Page	Custom Projects Review Guidance Documents (ca.gov)	CPUC webpage that provides "details on the Commission's policies and procedures to be utilized in the development of ex ante values for custom projects/measures."	Y
CPUC	CPUC Website: CPR Stakeholder Engagement Page	Custom Projects Review Stakeholder Engagement Page (ca.gov)	CPUC webpage hosting agendas and meeting materials from previous Custom Stakeholder Working Groups	Y
CPUC	CEDARS > DEER Resources	DEER Resources - CEDARS (sound-data.com)	Contains information about select EE technologies and measures, CPUC-approved tools, and Ex Ante Review Memos	Y*
CPUC	Custom Measure and Project Archive (CMPA)	Non-DEER Resources (deeresources.info)	Provides upload, browsing, and download of custom project and measure data submitted by PAs and reviewed by Energy Division.	No
SDG&E	CAEnergyGuidance.com ("Disposition Database")	Home Page - CA Energy Guidance	Searchable public database contains Program Administrator redacted versions of the CPUC staff dispositions, as well as ISP studies, guidance documents, and other Custom Projects related documents.	Y
SCE	Statewide Ex Ante Review Process Streamlining Work	Statewide Ex Ante Review Process Streamlining Work - Home (sharepoint.com)	SharePoint site for Statewide Resources and Coordination	No
SCE	SCE Resources for Trade Allies	Trade Professional Resources (site.com)	PA-hosted site for vendor resources	Y
SCE	SCE SmartSheet Platform		PA-hosted site for vendor resources	No
PG&E	PG&E Wiki Site	https://pge.wiki/Main_Page	PA-hosted site for vendor resources	No
SDG&E	??			??
SCG	??			??
Other PAs	??			??
Cal TF	Custom Subcommittee SharePoint	Cal TF Custom Subcommittee - Home (sharepoint.com)	Compiled custom resources and working documents related to the Cal TF Custom Initiative	Y*

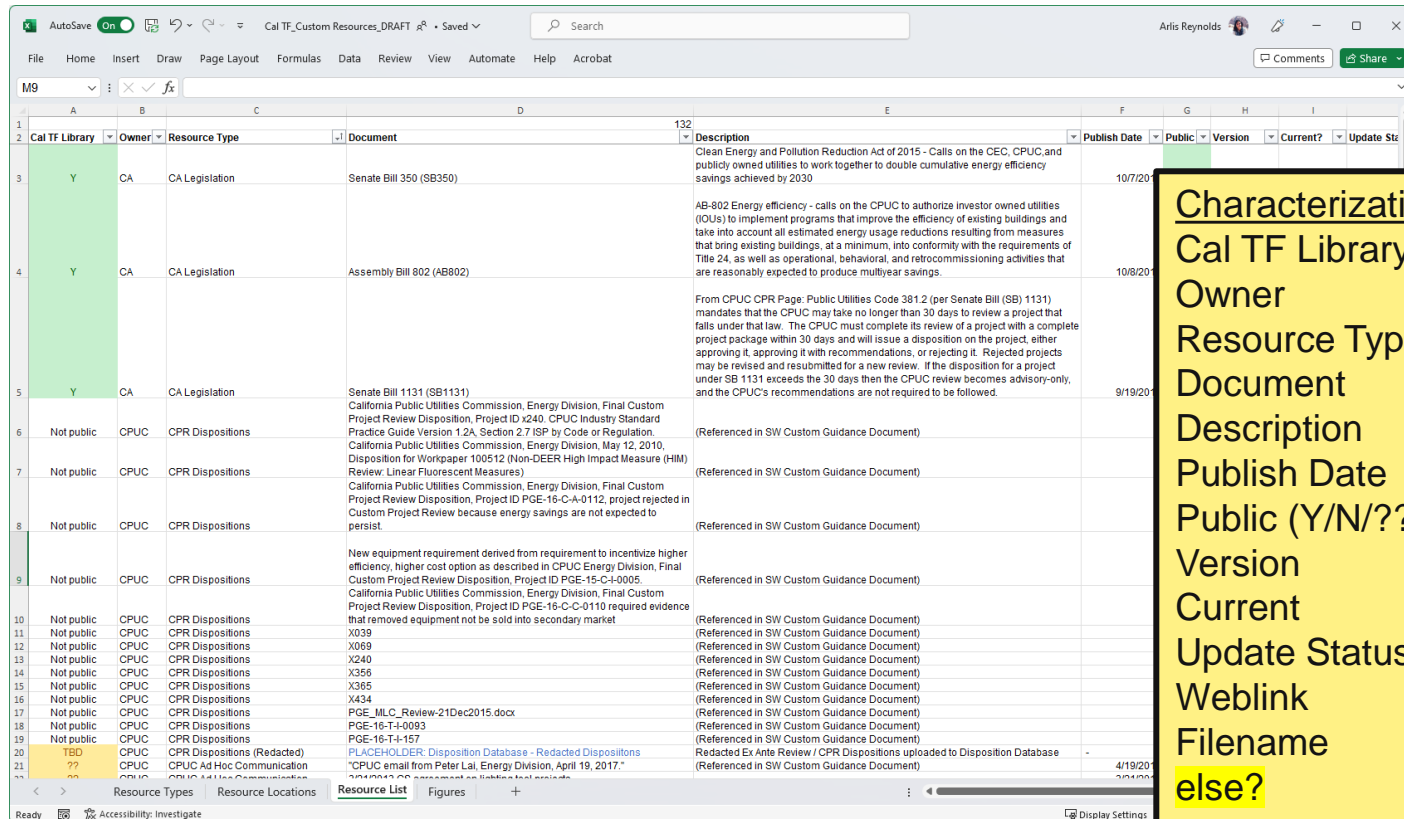
Q: Are there other locations for custom resources?

Custom Resources

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Resource List

Working list of documents identified and included (if available) in resource library



1	A	B	C	D	E	F	G	H	I	
2	Cal TF Library	Owner	Resource Type	Document	Description	Publish Date	Public	Version	Current?	Update Sta
3	Y	CA	CA Legislation	Senate Bill 350 (SB350)	Clean Energy and Pollution Reduction Act of 2015 - Calls on the CEC, CPUC, and publicly owned utilities to work together to double cumulative energy efficiency savings achieved by 2030	10/7/20				
4	Y	CA	CA Legislation	Assembly Bill 802 (AB802)	AB-802 Energy efficiency - calls on the CPUC to authorize investor owned utilities (IOUs) to implement programs that improve the efficiency of existing buildings and take into account all estimated energy usage reductions resulting from measures that bring existing buildings, at a minimum, into conformity with the requirements of Title 24, as well as operational, behavioral, and retrocommissioning activities that are reasonably expected to produce multyear savings.	10/8/20				
5	Y	CA	CA Legislation	Senate Bill 1131 (SB1131)	From CPUC CPR Page: Public Utilities Code 381.2 (per Senate Bill (SB) 1131) mandates that the CPUC may take no longer than 30 days to review a project that falls under that law. The CPUC must complete its review of a project with a complete project package within 30 days and will issue a disposition on the project, either approving it, approving it with recommendations, or rejecting it. Rejected projects may be revised and resubmitted for a new review. If the disposition for a project under SB 1131 exceeds the 30 days then the CPUC review becomes advisory-only, and the CPUC's recommendations are not required to be followed.	9/19/20				
6	Not public	CPUC	CPR Dispositions	California Public Utilities Commission, Energy Division, Final Custom Project Review Disposition, Project ID x240, CPUC Industry Standard Practice Guide Version 1.2A, Section 2.7 ISP by Code or Regulation	(Referenced in SW Custom Guidance Document)					
7	Not public	CPUC	CPR Dispositions	California Public Utilities Commission, Energy Division, May 12, 2010, Disposition for Workpaper 100512 (Non-DEER High Impact Measure (HIM) Review, Linear Fluorescent Measures)	(Referenced in SW Custom Guidance Document)					
8	Not public	CPUC	CPR Dispositions	California Public Utilities Commission, Energy Division, Final Custom Project Review Disposition, Project ID PGE-16-C-A-0112, project rejected in Custom Project Review because energy savings are not expected to persist.	(Referenced in SW Custom Guidance Document)					
9	Not public	CPUC	CPR Dispositions	New equipment requirement derived from requirement to incentivize higher efficiency, higher cost option as described in CPUC Energy Division, Final Custom Project Review Disposition, Project ID PGE-15-C-1-0005	(Referenced in SW Custom Guidance Document)					
10	Not public	CPUC	CPR Dispositions	California Public Utilities Commission, Energy Division, Final Custom Project Review Disposition, Project ID PGE-16-C-C-0110 required evidence that removed equipment not be sold into secondary market	(Referenced in SW Custom Guidance Document)					
11	Not public	CPUC	CPR Dispositions	X039	(Referenced in SW Custom Guidance Document)					
12	Not public	CPUC	CPR Dispositions	X069	(Referenced in SW Custom Guidance Document)					
13	Not public	CPUC	CPR Dispositions	X240	(Referenced in SW Custom Guidance Document)					
14	Not public	CPUC	CPR Dispositions	X356	(Referenced in SW Custom Guidance Document)					
15	Not public	CPUC	CPR Dispositions	X365	(Referenced in SW Custom Guidance Document)					
16	Not public	CPUC	CPR Dispositions	X434	(Referenced in SW Custom Guidance Document)					
17	Not public	CPUC	CPR Dispositions	PGE_MLC_Review-21Dec2015.docx	(Referenced in SW Custom Guidance Document)					
18	Not public	CPUC	CPR Dispositions	PGE-16-T-1-0093	(Referenced in SW Custom Guidance Document)					
19	Not public	CPUC	CPR Dispositions	PGE-16-T-1-167	(Referenced in SW Custom Guidance Document)					
20	TBD	CPUC	CPR Dispositions (Redacted)	PLACHOLDER Disposition Database - Redacted Dispositions	Redacted Ex Ante Review / CPR Dispositions uploaded to Disposition Database					
21	??	CPUC	CPUC Ad Hoc Communication	CPUC email from Peter Lai, Energy Division, April 19, 2017	(Referenced in SW Custom Guidance Document)	4/19/20				
22	??	CPUC	CPUC Ad Hoc Communication	CPUC Ad Hoc Communication - Disposition Database	(Referenced in SW Custom Guidance Document)	3/14/20				

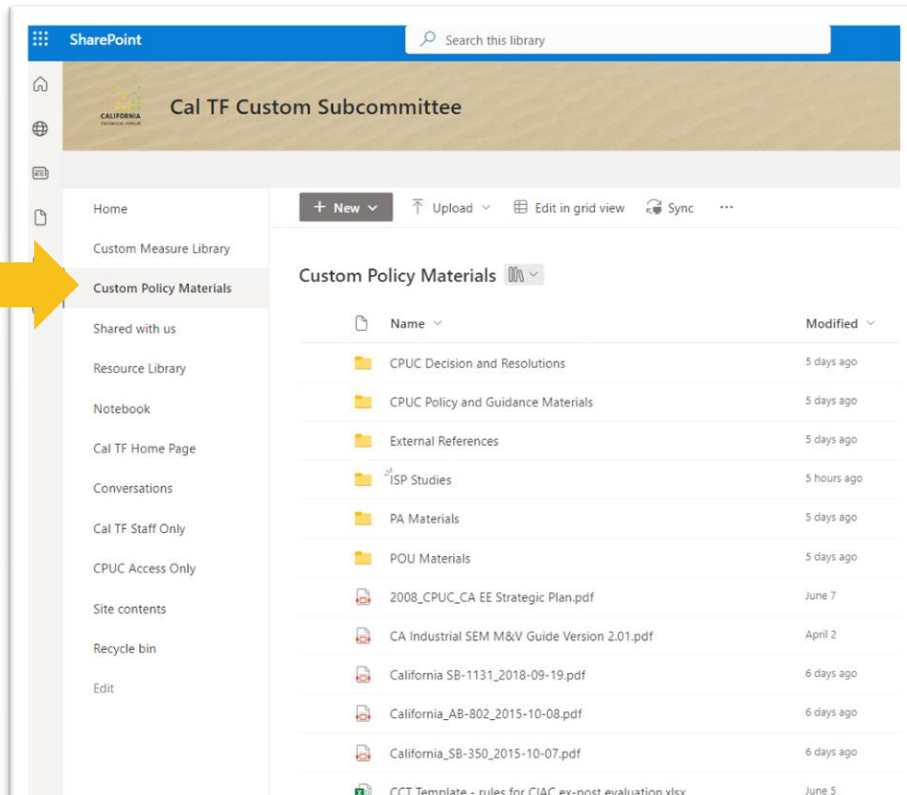
Characterizations
 Cal TF Library (Y/N/??)
 Owner
 Resource Type
 Document
 Description
 Publish Date
 Public (Y/N/??)
 Version
 Current
 Update Status
 Weblink
 Filename
 else?

Custom Resources

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Custom Policy Materials

SharePoint library of materials (in progress; updated on ongoing basis)



The screenshot shows a SharePoint interface for a library titled "Cal TF Custom Subcommittee". The left-hand navigation pane includes links for Home, Custom Measure Library, Custom Policy Materials (highlighted with a yellow arrow), Shared with us, Resource Library, Notebook, Cal TF Home Page, Conversations, Cal TF Staff Only, CPUC Access Only, Site contents, Recycle bin, and Edit. The main content area displays a list of "Custom Policy Materials" with columns for Name and Modified. The list includes folders like "CPUC Decision and Resolutions", "CPUC Policy and Guidance Materials", "External References", "ISP Studies", "PA Materials", and "POU Materials", as well as PDF files such as "2008_CPUC_CA EE Strategic Plan.pdf", "CA Industrial SEM M&V Guide Version 2.01.pdf", "California SB-1131_2018-09-19.pdf", "California_AB-802_2015-10-08.pdf", and "California_SB-350_2015-10-07.pdf". An Excel file "CCT Template - rules for CIAC ex-post evaluation.xlsx" is also listed.

Name	Modified
CPUC Decision and Resolutions	5 days ago
CPUC Policy and Guidance Materials	5 days ago
External References	5 days ago
ISP Studies	5 hours ago
PA Materials	5 days ago
POU Materials	5 days ago
2008_CPUC_CA EE Strategic Plan.pdf	June 7
CA Industrial SEM M&V Guide Version 2.01.pdf	April 2
California SB-1131_2018-09-19.pdf	6 days ago
California_AB-802_2015-10-08.pdf	6 days ago
California_SB-350_2015-10-07.pdf	6 days ago
CCT Template - rules for CIAC ex-post evaluation.xlsx	June 5

Q: How do we make this more useful and user-friendly, now and later?

Running List of Recommendations

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- Resources (may be overlapping)
 - Library of policy and resource documents/materials
 - Statewide Custom Guidance Document or Wiki
 - Running list of policy, guidance, interpretations
 - Statewide digest of relevant disposition findings
 - Statewide list of standard practice baselines
 - ALL central, accessible, searchable, up-to-date w/ notifications
- Needs
 - Reduce number of resources; eliminate/minimize overlapping materials
 - Resource/process to maintain resources up to date
 - More consistent sharing across PAs, broader stakeholders
 - Ability to track/reference projects across guidance/resources
 - Improve Ex Ante and Ex Post alignment/consistency
 - Make CPR Disposition comments more clear (identify issue and provide solution)
 - Connect guidance/interpretation to formal policy
 - Identify/address inconsistent interpretation/application of policy

Q: What other ideas / needs should we consider?

Detailed Policy Review

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- Comprehensive policy review related to custom measures/programs
 - Understand current policy (e.g., what has been superseded)
 - Identify any overlapping/conflicting policy
 - Identify any gaps in current policy and practice
 - Seek clarification where needed
 - Make recommendations to address policy pain points

- Discussion/Input:
 - What specific questions do you have about custom policy/guidance?
 - Where might there be gaps in policy and practice?
 - What are key policy pain points?

Detailed Policy Review

62

- Comprehensive policy review related to custom measures/programs
 - Understand current policy (e.g., what has been superseded)
 - Identify any overlapping/conflicting policy
 - Identify any gaps in current policy and practice
 - Seek clarification where needed
 - Make recommendations to address policy pain points
- Discussion/Input:
 - What specific questions do you have about custom policy/guidance?
 - Where might there be gaps in policy and practice?
 - What are key policy pain points?

Policy Review Brainstorm

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- What policy/guidance/requirement/practice do you want to bring attention to (e.g., question/concern)?

- Brainstorm
 - Identify specific policy, guidance, requirement, practice (provide specific reference if possible).
 - Describe question or concern
 - ✦ Question/clarification
 - ✦ Possible conflict/inconsistency in policy/practice
 - ✦ Policy concern (e.g., creates barriers to EE goals)
 - ✦ Other
 - Rank importance / impact
 - ✦ 1 = low impact
 - ✦ 5 = mission critical

Next Steps

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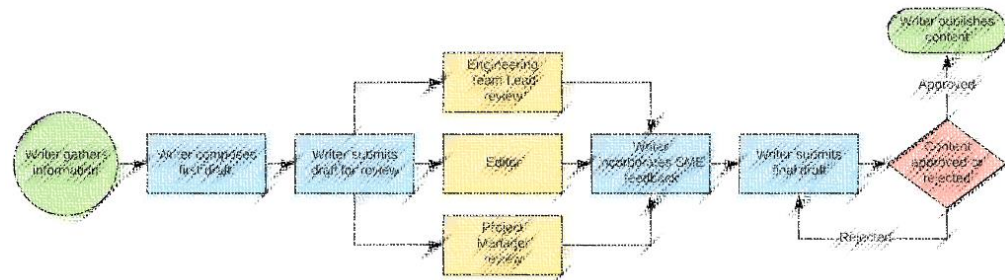
- Cal TF Staff
 - ❑ Continue to populate Custom Resources Workbook and Custom Policy Materials library
 - ❑ Identify document update needs
 - ❑ Develop recommendations
 - ❑ Initiate Custom Policy Review

- Custom Stakeholders – Input on:
 - ❑ making Resource List/Library useful & user-friendly
 - ❑ which resources are most useful, need update/clarification
 - ❑ missing documents (what can't you find?)
 - ❑ policy clarifications and pain points

5C: Develop and Implement SW Methods

5C-2: Custom MP Develop/Update Workflow

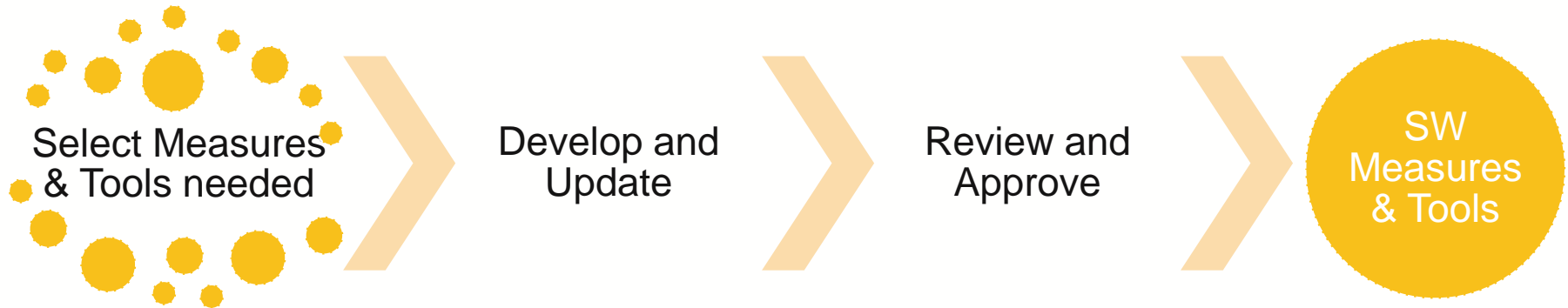
- **Objective**
 - Formal workflow and process for developing, reviewing, and updating SW Custom Measures and Tools
- **Approach**
 - Adapt deemed MP workflows to custom
 - Seek CPUC buy-in to provide input and review proposed SW custom measures and tools



- **Deliverables**
 - Custom Measure Package Development and Update Workflow, presented to TF for affirmation
 - Assessment of potential to implement approved workflow in eTRM

TF Discussion Questions

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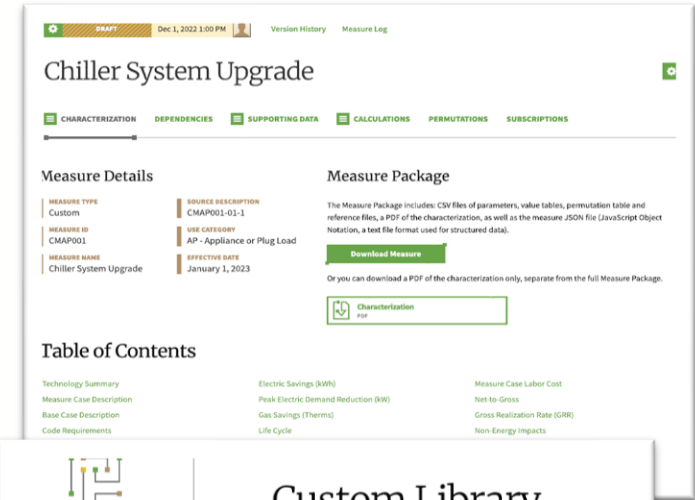


- What is the “ideal state” for SW measures and tools?
- How do we **develop** SW measures and tools?
- How should we **vet**, **review**, and **approve** SW measures and tools?
- How should we **maintain** up-to-date measures/tools?

Overarching Goal

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- Public library of Custom Measures and Custom Tools that are:
 - ❑ Complete
 - ❑ Clear, easy-to-read/understand
 - ❑ Consistent
 - ✦ Format
 - ✦ Dev/update process
 - ❑ Well-documented
 - ✦ Include Training materials
 - ✦ Policy/guidance references
 - ✦ Changes/updates/bugs/needed updates
 - ❑ Maintained up-to-date
 - ❑ Versioned
 - ❑ Meet appropriate technical rigor
 - ❑ Reliable (ideally CPUC-approved)



Chiller System Upgrade

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

Measure Details

MEASURE TYPE Custom	SOURCE DESCRIPTION CMAPO01-01-1
MEASURE ID CMAPO01	USE CATEGORY AP - Appliance or Plug Load
MEASURE NAME Chiller System Upgrade	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).

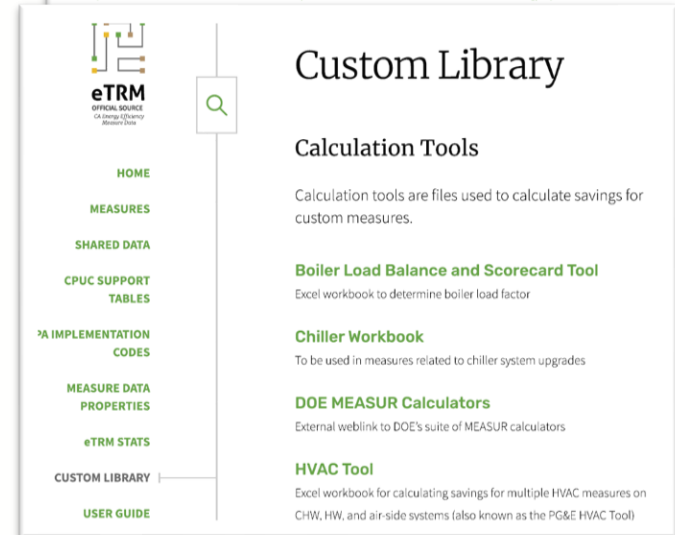
[Download Measure](#)

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

[Characterization PDF](#)

Table of Contents

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



eTRM
OFFICIAL SOURCE
of Energy Efficiency
Measures Data

HOME

MEASURES

SHARED DATA

CPUC SUPPORT TABLES

IMPLEMENTATION CODES

MEASURE DATA PROPERTIES

eTRM STATS

CUSTOM LIBRARY

USER GUIDE

Custom Library

Calculation Tools

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

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)

Q: What other features ensure SW measures and tools will be used and useful?

Deemed MP Development

The workflow in the eTRM consists of two primary segments:

PA Measure Development

In these Guidelines, “PA measure development” refers to all activities undertaken by a PA team (PA staff and its contractors) to create a new statewide energy efficiency measure version.

This segment also includes review of the unpublished measure version by Cal TF Staff and under certain circumstances by a Cal TF subcommittee.

CPUC Review

“CPUC review” refers to all activities undertaken by the CPUC review team (CPUC staff and its ex ante review team contractors) to review submitted versions, provide comments, request information from the PA, and issue a final disposition (approve or reject the measure version for IOU portfolios).

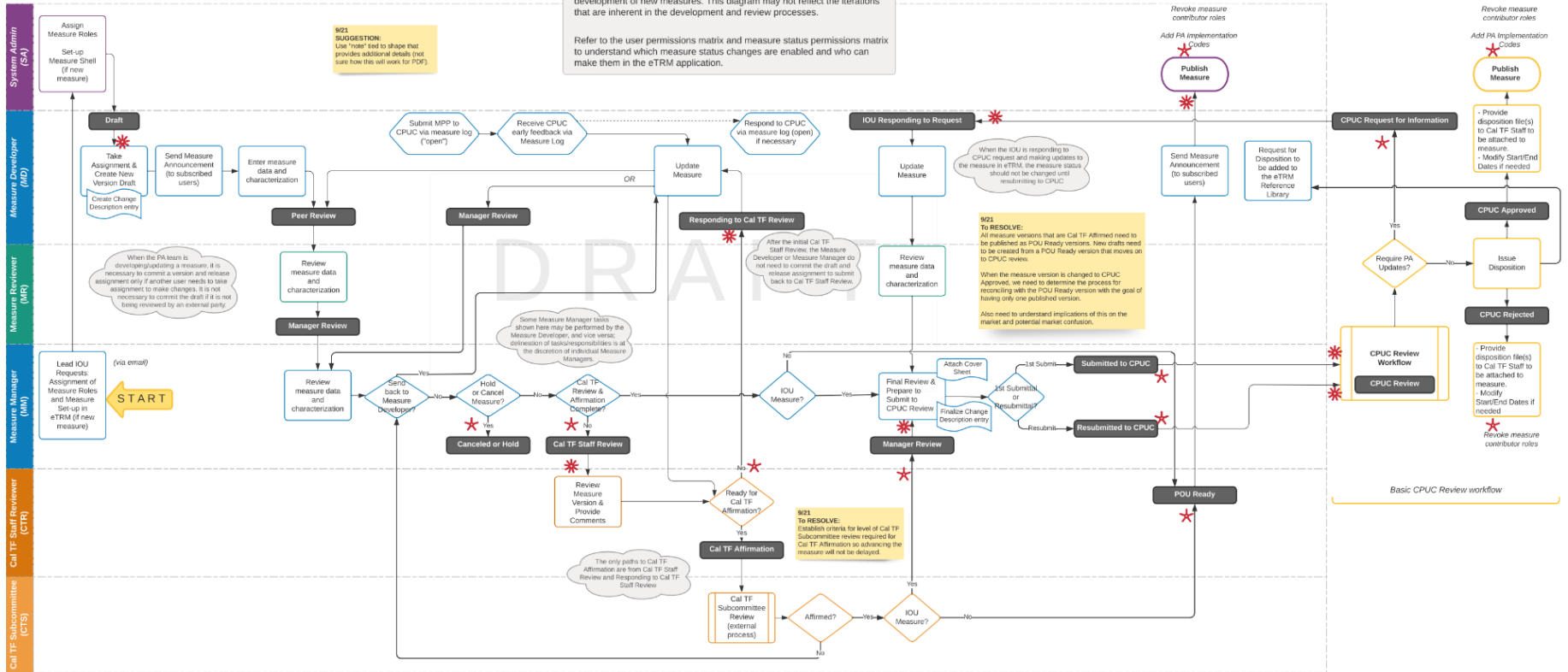
Only measure versions that are intended for the IOU portfolios need to be submitted to the CPUC review process.

Deemed MP Development

eTRM Workflow: PA Measure Development/Measure Update

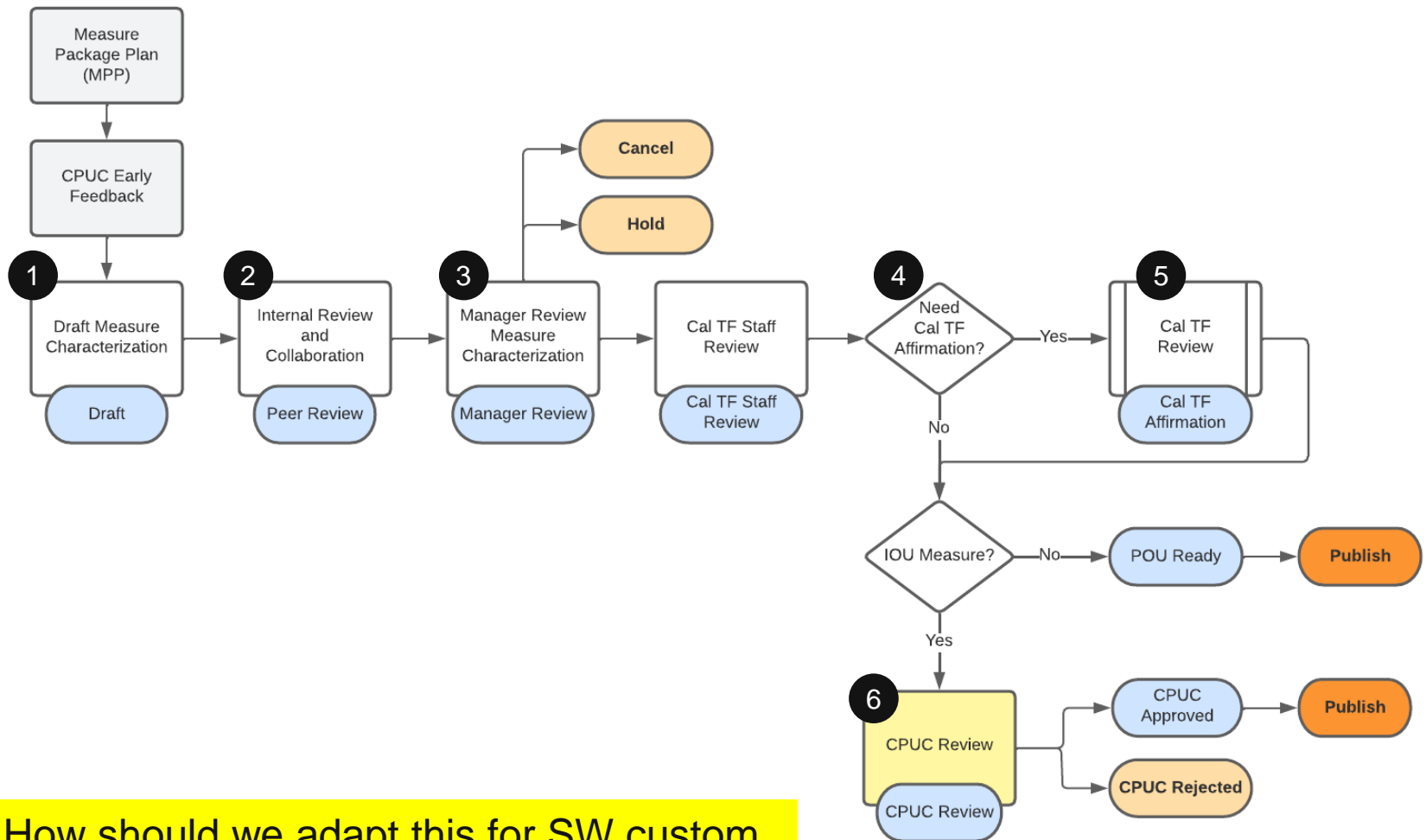
This is a generic workflow that applies to standard measure updates and the development of new measures. This diagram may not reflect the iterations that are inherent in the development and review processes.

Refer to the user permissions matrix and measure status permissions matrix to understand which measure status changes are enabled and who can make them in the eTRM application.



Deemed MP Development, Simplified

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Q: How should we adapt this for SW custom measures and tools?

Discussion

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- Development

- Q1. Deemed requires a “Lead PA” for all MPs. Should this be required for custom measures/tools?
- Q2. How do we determine development and peer review team?
- Q3. Do we need the Manager Review step (e.g., if Cal TF oversees process)?

- Review and Approval

- Q4. Require Cal TF affirmation for all measures? When? How? Who?
- Q5. What does Cal TF need to review/affirm a Custom Measure Package and/or Tool?
- Q6. Custom methods and tools are not typically pre-approved by CPUC. Should we pursue CPUC pre-approval?

- Others

- Formal PA approval on all measures and tools?
- Different pathways for hybrid, POU, IOU custom measures?
- Differences for Measure Guidance vs. Tools?
- Ownership & funding for development/updates?
- Who receives and responds to comments/bugs

BREAK
2:30 – 2:45

Metric 5C-1


Statewide Custom Measure Packages

- **Objective**
 - SW Custom Measure Packages (**CMP**)
 - ✦ Definitions
 - ✦ Eligibility
 - ✦ Savings methods
 - ✦ Data collection requirements
 - ✦ M&V requirements
 - ✦ Calculation Tools/Resources
- **Approach**
 - Custom Measure Subgroups
 - Solicit CPUC input
 - Custom Subcommittee approval
 - Cal TF affirmation
 - Solicit CPUC approval
- **Deliverables**
 - Custom Measure Packages, presented to Custom Subcommittee for recommendation

Custom Measure Characterization

Statewide Measure Packages

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- Boiler Efficiency 
 - July TF meeting
 - Retro-commissioning
 - Target September TF meeting
 - Chiller System Upgrade
 - Target October TF meeting
 - Pump Systems
-
- All materials accessible on the SharePoint [Custom Measure Library](#)
 - Email Spencer.Lipp@futee.biz to join working group(s).

SW Custom MP Boiler Timeline

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- ☑ 4/5 - Present MP to Custom Subcommittee
- ☑ 5/3 - Update at Custom Subcommittee
- ☑ 5/8 – Initial comments due
- ☑ 5/26 – Boiler measure group review of comments
- ☑ 6/30 - Post final drafts for Subcommittee review
- ☑ 7/12 – Custom Subcommittee final review and recommendation to bring to Cal TF
- **7/27 – Cal TF affirmation**
- TBD – CPUC approval

Boiler Measure Package

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Materials

- [Measure Package](#)
 - [Measure Characterization](#)
 - 3 tools:
 - ✦ [Load Balance & Score Card Tool \(ver 1.43\).xls](#)
 - ✦ [Excess air and boiler efficiency.xlsx](#)
 - ✦ [DOE MEASUR](#)

Hyperlinks require access to the Custom Subcommittee SharePoint site; email arlis.reynolds@futee.biz to request access.

Group Members

- Steven Long* (ICF)
- Roger Baker* (Indep)
- Myrna Dayan* (Cascade)
- Wayne Chi (SCG)
- Afshan Hasan (SCG)
- Wilfredo Garcia (SCG)
- Anthony Zavala (SCG)
- Jessie Wang (SDG&E)
- Novi Leigh (ICF)
- Vivek Joshi (Willdan)
- Glen LaPalme (TRC)

* TF member

Boiler Measure Package

77

- Boiler replacements not covered by deemed MPs
 - MAT and capacity eligibility on a later slide (Seeking TF Input)
 - Only applies to retrofit cases
 - No major capacity change
 - Operating pressure > 15 psig
- Excess air and boiler efficiency tool to determine site specific baseline (Seeking TF Input)
- Provides step by step M&V and calculation procedure

Boiler MP Eligibility (TF Input)

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Deemed Measures

- SWHC004 – Space heating
 - Multifamily, commercial and industrial
 - NR on <10,000 kbtu/hr capacity
- SWWH010 – DHW
 - Multifamily
 - NR with no capacity threshold
- SWWH005 – DHW
 - Commercial
 - NR and AR (DI) all capacities
- SWWH008 – Process
 - Agriculture, commercial and industrial
 - NR <= 20,000 kbtu/hr capacity

Eligible Custom

- Space heating
 - Multifamily, commercial, and industrial
 - ✦ AR for all capacities
 - ✦ NR >=10,000 kbtu/hr capacity
- Domestic water heating
 - Multifamily AR for all capacities
 - Commercial AR non-DI delivery for all capacities
- Process
 - Agriculture, commercial and industrial
 - ✦ AR for all capacities
 - ✦ NR >=20,000 kbtu/hr capacity

Boiler Tool Descriptions

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- DOE MEASUR for claimed savings calculations
 - Previous DOE Steam System Modeling Tool
 - Build up system by component modules
 - Adjust Boiler Operations, Combustion Efficiency

SELECT POTENTIAL ADJUSTMENT PROJECTS

Select potential adjustment projects to explore opportunities to increase efficiency and the effectiveness of your system.

Add New Scenario

Modification Name

Efficiency

Adjust General Operations

Adjust Unit Costs

Adjust Boiler Operations

Adjust Boiler Combustion Efficiency

Baseline
Combustion Efficiency
78%

Modifications
Combustion Efficiency
85 %

RESULTS

SANKEY

HELP

Percent Savings (%)

— —

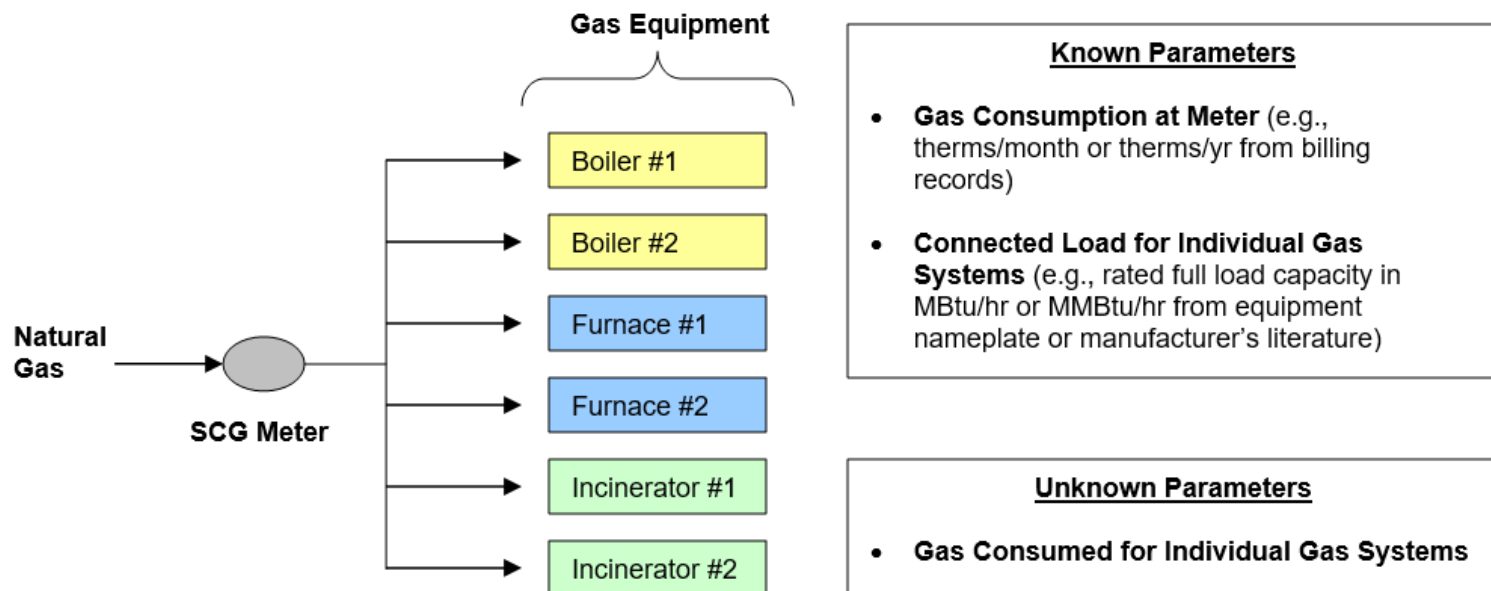
8.0%

Fuel Usage (MMBtu/yr)	4,494,046.8	4,123,948.9
Fuel Cost (\$/yr)	\$25,975,591	\$23,836,424
Electricity Purchased (kWh/yr)	40,000,000	40,000,000
Electricity Cost (\$)	2,000,000	2,000,000
Water Usage (gal/yr)	176,236,210.5	176,236,210.5
Water Cost (\$/yr)	440,591	440,591
Power Generated (kW)	13,807.6	13,807.6
Process Use (MMBtu/yr)	306.5	306.5
Stack Loss (MMBtu/yr)	123.6	77.3
Vent Losses (MMBtu/yr)	0.5	0.5
Unrecycled Condensate Losses (MMBtu/yr)	51.5	51.5

Boiler Tool Descriptions

80

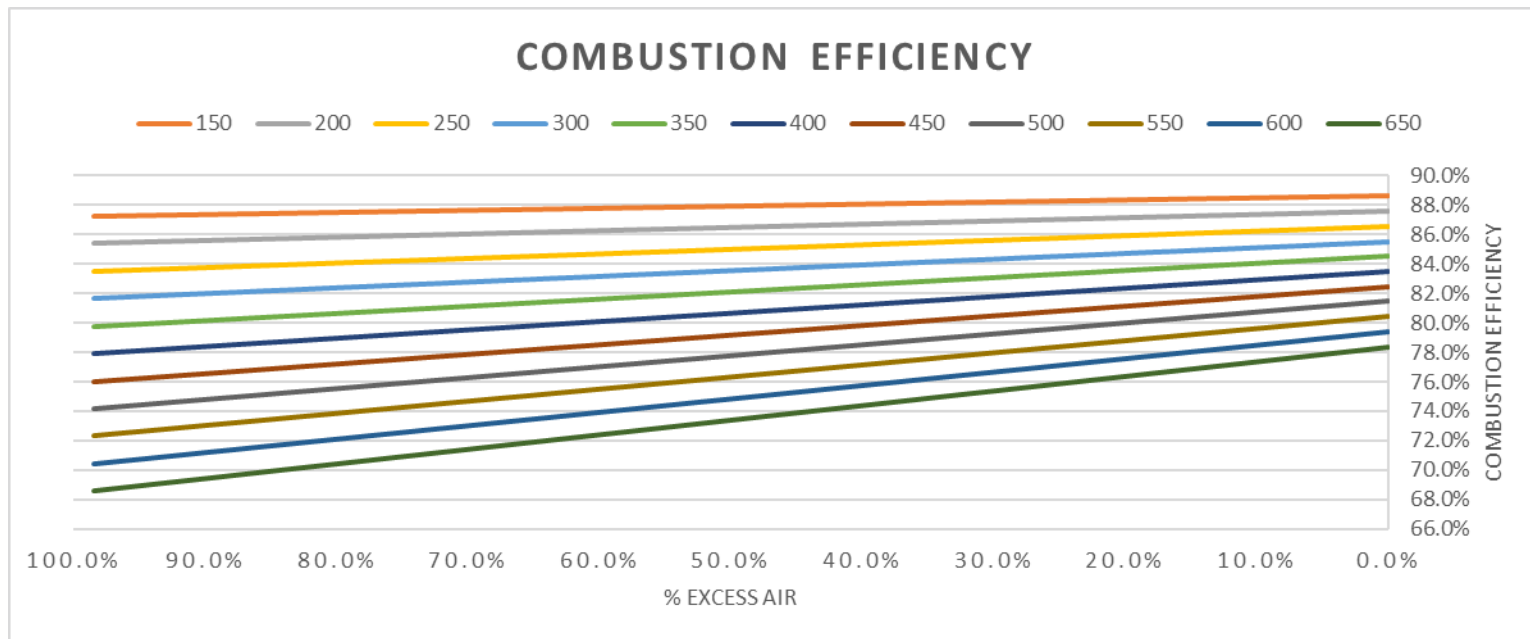
- Load Balance and Scorecard Tool
 - Excel calculator (SoCalGas)
 - Defined methodology to determine gas use estimates for equipment connected to a common meter



Boiler Tool Descriptions

81

- Excess air and boiler efficiency
 - Excel calculator (SoCalGas)
 - Uses the same method as [CA Air Resources Board](#) (ASME PTC-4 indirect method)
 - Three inputs – ambient temperature, excess O₂%, stack temperature
 - Outputs combustion efficiency



Boiler Efficiency Tool (TF Input)

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Excess air and boiler efficiency

- Inputs
 - AVG ambient temperature, excess O₂%, stack temperature
 - ASME method
- Output combustion efficiency
- Ambient temperature (needs update)
- Comparatively conservative on AVG <80F

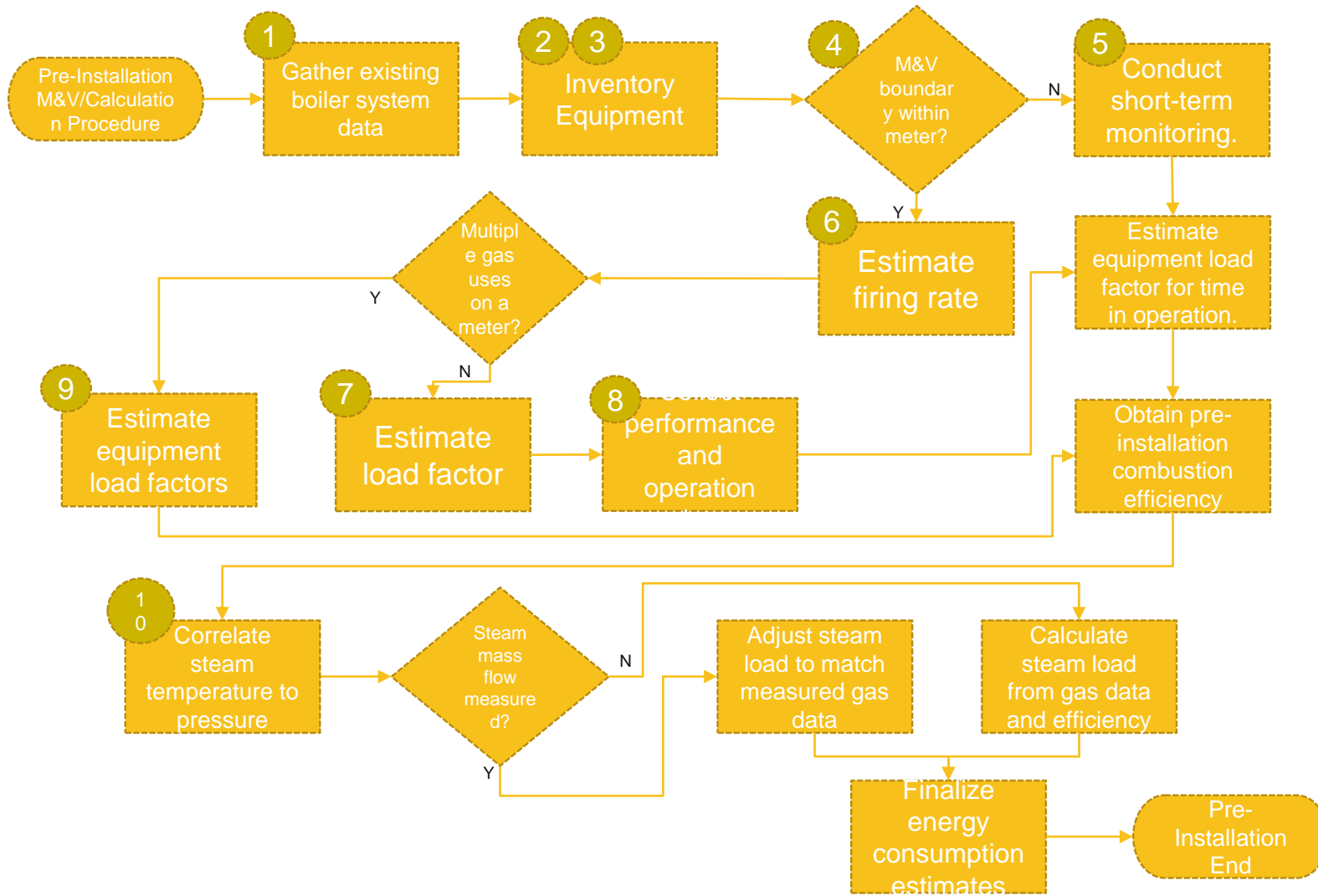
DOE MEASUR

- Inputs
 - AVG ambient temperature, excess air%, stack temperature
 - ASME method
- Output combustion efficiency
- Ambient temperature = impact
- Comparatively conservative on AVG >80F

Ambient Temperature Source (TF Input)

83

- Ambient temperature impacts efficiency because it changes in heat required for combustion air to deliver the same heat output
- Validation of ambient temperatures
- Short term ambient temp monitoring is in the current MC for all scenarios
- Potential solutions without monitoring
 - Outdoor – CZ2022 weather data
 - Indoor – will vary based on climate/season



Example of M&V Points

85

1. **Gather Existing Boiler System Data box** - Boiler system data includes:
 - a. Boiler nameplate information
 - b. Deaerator pressure read from gauge or assume ~5-10 psig
 - c. Blowdown rate percentage with
 - i. Measurement of water conductivity of boiler feedwater
 - ii. Measurement of blowdown conductivity of boiler blowdown water
 - iii. Water treatment report by customer vendor
 - d. Steam pressure (psig) measurement with pressure gauge (Image, or available data logs if tracked)
2. **Inventory Equipment box** - Inventory the equipment connected to the meter and collect **Connected Load** (e.g., rated full load capacity in Btu/hr from equipment nameplate or manufacturer's literature), estimated firing rate (load factor multiplied by connected load) and annual operating hours of each piece of equipment.
3. **Inventory Equipment box** - If meter data lacks frequent readings to obtain operating hours, interview plant personnel regarding nominal boiler operation and maintenance activities.
4. **M&V Boundary Within Meter decision** - Utility meter or submeter.

Condensate Controls Changes (TF Input)

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Include Condensate Controls

- Original language for Custom Subcommittee
 - If condensate controls changes are made, return temperature should be considered.
- Rationale
 - Condensate parameters are part of MEASUR.
 - Condensate return temperature can impact the boiler efficiency based on modifying the feedwater enthalpy

Do Not Include Condensate Controls

- Proposed to delete the condensate controls changes language
- Rationale
 - Condensate return changes are a separate measure
 - Boiler efficiency is captured with energy differential whether controls are installed or not.

Cal TF Staff Solution – Added “As these parameters are not included in the boiler efficiency measure, any control changes would be claimed as a separate measure. If the change was made absent of the program intervention, the baseline may need to be adjusted to reflect the current operation”

Discussion/Questions

87

- Comments from the TF?
- **ACTION:** Affirmation of the Boiler Custom Measure Package (CMP)

Metric 5C-1

Statewide Custom Measure Packages

- **Objective**
 - SW Custom Measure Packages (**CMP**)
 - ✦ Definitions
 - ✦ Eligibility
 - ✦ Savings methods
 - ✦ Data collection requirements
 - ✦ M&V requirements
 - ✦ Calculation Tools/Resources
- **Approach**
 - Custom Measure Subgroups
 - Solicit CPUC input
 - Custom Subcommittee approval
 - Cal TF affirmation
 - Solicit CPUC approval
- **Deliverables**
 - Custom Measure Packages, presented to Custom Subcommittee for recommendation

Custom Measure Characterization

RCx Measure Package

Materials

- [Measure Package](#)
 - [Measure Characterization](#)
 - [HVAC Tool – Current Draft Version](#)
 - [HVAC Tool Methodology – Current Draft Version](#)

Group Members

- Armen Saiyan* (LADWP)
- Adan Rosillo* (PG&E)
- Michael Green* (Willdan)
- Glen LaPalme (TRC)
- Sean Lim (LADWP)
- Danny Ng (PG&E)
- Mustafa Odeh (Willdan/TRC)
- Felix Monterroso (Willdan)
- Mohit Shah (TRC)
- Shane Sugiyama (SCE)
- Ajay Wadhera (SCE)
- Jessie Wang (SDG&E)
- Babak Yazdanpanah (LADWP)

* TF member

Hyperlinks require access to the Custom Subcommittee SharePoint site; email arlis.reynolds@futee.biz to request access.

RCx Measure Package Overview

90

- ~40 GWh claimed in HVAC RCx from 2019-2022
- Set of common RCx measures for HVAC systems
 - Not intended to be exhaustive
- Define streamlined delivery
 - Identified calculation tool (PG&E HVAC Tool)
 - Transparent data collection/M&V (Remaining major issue)
- Implementers could develop a specific strategy
 - Target specific customer segments and/or customer's likely to have RCx opportunities (low EnergyStar score or [benchmark](#))
 - Develop standard customer intake forms (eligibility and influence)
 - Develop standard data collection forms (link to HVAC tool)
 - Standard PFS/IR template heavily relying on HVAC Tool and other documentation for site specific information

RCx Measures

91

- Air-side Measures
 - Scheduling optimization
 - Economizer optimization
 - Static pressure reset
 - Supply air temperature reset
 - Fan VFD optimization
 - VAV flow adjustment
- Hot water plant measures
 - Hot water lockout control
 - Boiler staging/sequencing
 - Hot water temperature reset
 - Hot water differential pressure reset
 - SHWP VFD optimization
- Chilled water plant measures
 - Chilled water lockout control
 - Chiller staging/sequencing
 - Condenser water temperature reset
 - Cooling tower staging/sequencing
 - Chilled water differential pressure reset
 - SCHWP VFD optimization
 - Condenser WP VFD optimization

Discussion/Questions

92

- Target September TF meeting for affirmation
- Comments/questions from the TF?

Chiller Measure Package

Materials

- [Measure Package](#)
 - [Measure Characterization](#)
 - [HVAC Tool – Current Draft Version](#)
 - [HVAC Tool Methodology – Current Draft Version](#)

Hyperlinks require access to the Custom Subcommittee SharePoint site; email arlis.reynolds@futee.biz to request access.

Group Members

- Armen Saiyan* (LADWP)
- Myrna Dayan* (Cascade)
- Jamie Gustafson (Willdan)
- Sean Lim (LADWP)
- Danny Ng (PG&E)
- Shane Sugiyama (SCE)
- Efren Villasenor (SCE)
- Ajay Wadhera (SCE)
- Jessie Wang (SDG&E)
- Babak Yazdanpanah (LADWP)

* TF member

Chiller Measure Package Overview

94

- ~17 GWh claimed in custom HVAC and process chiller systems from 2019-2022
- Using the PG&E HVAC Tool
- Considerable HVAC measures deemed
 - HVAC chillers – SWHC005, SWHC020, and SWHC052
 - HVAC CHWP and CWP VFD - SWHC008
- Current measures
 - Process chillers (AR, NR, NC)
 - Process CHWP and CWP pump VFD (AOE)
 - HVAC chillers (AR)
 - “Non-standard” HVAC CHWP and CWP VFD (AOE)
 - POU Office to MF Building Conversion (NC)

Chiller Measure Package Path

95

- Thorough Draft Measure Characterization
- Outstanding components for resolution
 - Finalize measures (process and non-standard VFD applications)
 - Title-24 overlap or implications on eligibility
 - Requirement to include the Refrigerant Avoided Cost Calculator (RACC)
 - Eligibility clarifications based on HVAC tool limitations
 - Data collection and M&V requirements
 - Inclusion of POE requirements
 - Applicability of host or host proxy for AOE EUL

Discussion/Questions

96

- Target October TF meeting for affirmation
- Comments/questions from the TF?

Next Steps

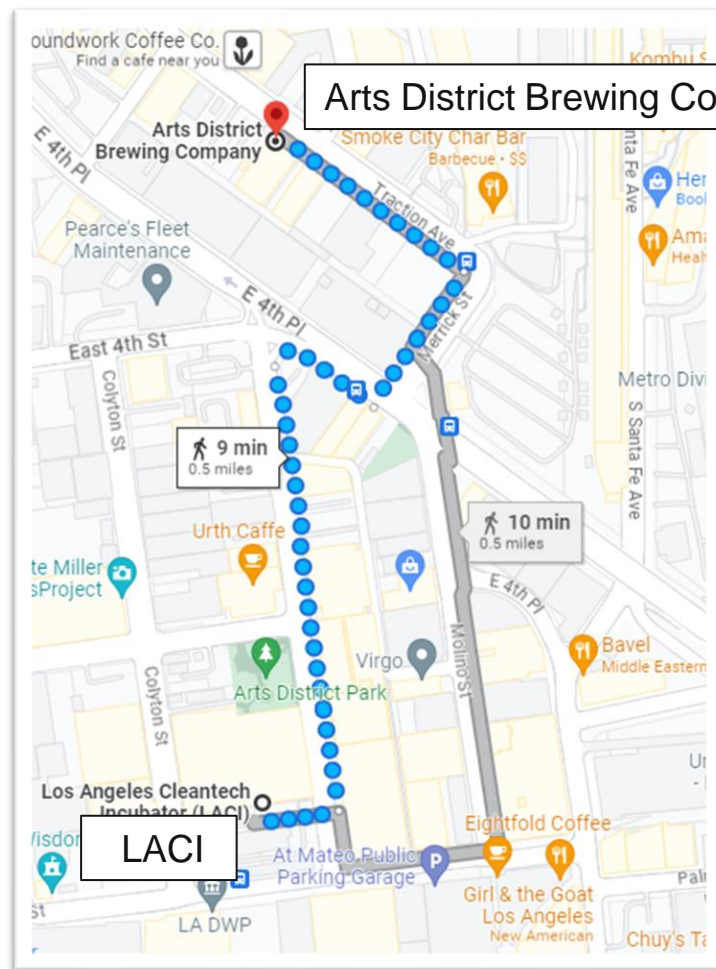
- Action Items
 - Complete Tools Review **by 7/28**
 - Complete ISP Survey **by 8/9**
 - ✦ Stakeholders with custom SP baseline selection experience
 - Cal TF upload updated slides
 - Questions/input/ideas to arlis.reynolds@futee.biz and spencer.lipp@futee.biz

- Next TF Meeting
 - **No meeting in August**
 - Thursday, September 28, 10am – 4pm
 - ✦ PG&E HQ in Oakland
 - ✦ Data Charette Part 2

No-host Happy Hour

98

9-minute walk
0.5 miles



5A: Gather/Organize/Prioritize

99

5A-1: Custom Regulatory Summary Review

- **Objective**
 - Summarize the sources and scope of existing custom regulatory guidance
 - Develop recommendations to improve access and clarity for all stakeholders
- **Approach**
 - Gather and summarize existing resources
 - ✦ *Need support from CPUC, IOUs to identify/access*
 - Characterize resources (e.g., accessibility, update status, update frequency, clarity, and usefulness)
 - Identify potential overlap, conflicts
 - Develop, prioritize recommendations
- **Deliverables**
 - Summary of custom regulatory resources, policy, and guidance resources
 - Proposal to improve approach to summarizing and providing clear guidance on custom projects

5A-2: Statewide Custom Measure ID

- **Objective**
 - Establish a Statewide Measure ID structure for custom measures
- **Approach**
 - Review existing PA-specific measure codes
 - Model deemed measure code structure
 - Map existing PAC codes to proposed new code structure
- **Deliverables**
 - Proposed SW Custom Measure ID Convention for Custom Measures
 - Table to map existing PA-specific measure codes to proposed SW Measure ID



5A: Gather/Organize/Prioritize

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5A-3: List of Measures for Statewide Methods

- **Objective**
 - Identify and prioritize custom measures for statewide standardization and hybrid methods
- **Approach**
 - Identify common custom measures
 - ✦ Custom program activity and claims data
 - ✦ Existing methods guidance documents
 - ✦ Stakeholder input on potential new custom measures
 - Identify “hybrid” opportunities
 - Prioritize measures for statewide development
- **Deliverables**
 - List of custom measures recommended for SW standard and/or hybrid methods

5A-4: List of Custom Tools

- **Objective**
 - Identify and characterize custom tools that stakeholders may use to develop custom projects
- **Approach**
 - Identify and gather existing tools
 - ✦ *Need support from CPUC, IOUs, implementers to identify/access*
 - Characterize tools (e.g., use, status)
 - Identify and prioritize needs to improve the library of useful tools
- **Deliverables**
 - List of characterized custom tools used in past five years.
 - Public library of custom tools with summary information
 - Prioritized list of needs to update, seek approval, and/or develop new custom tools.



5B: Custom Roadmap

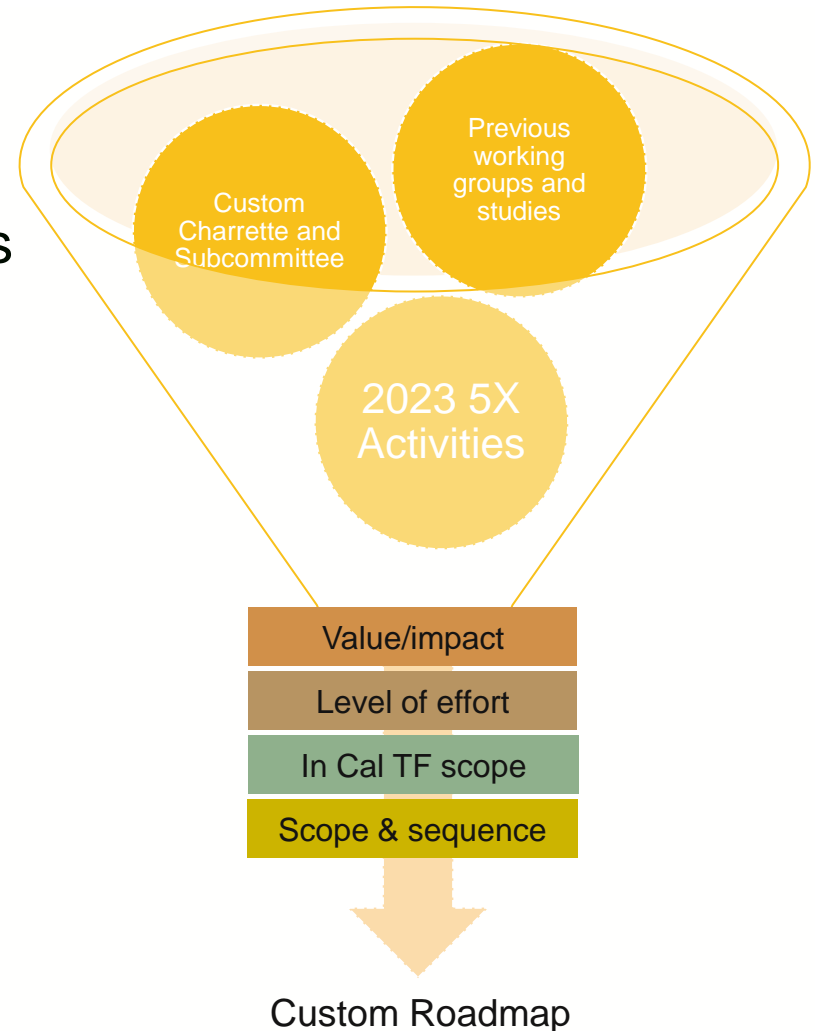
101

- **Objectives**

- High-level scope, priorities, and schedule for future Cal TF activities
- Framework for Custom Initiative tactics in the annual Business Plan

- **Deliverables**

- Summary of characterized custom improvement goals and activities
- Draft and Final Custom Roadmap
 - ✦ Requires PAC approval



5C: Develop/Implement SW Methods

102

5C-1: Statewide Custom Measures (3)

Objective

- SW Custom Measures
 - Definitions
 - Eligibility
 - Savings methods
 - Data collection requirements
 - M&V requirements
 - Calculation Tools/Resources

Custom
Measure
Characterization

Approach

- Custom Measure Subgroups
- Solicit CPUC input
- Custom Subcommittee approval
- Cal TF affirmation
- Solicit CPUC approval

Deliverables

- Custom Measure Packages, presented to Custom Subcommittee for affirmation

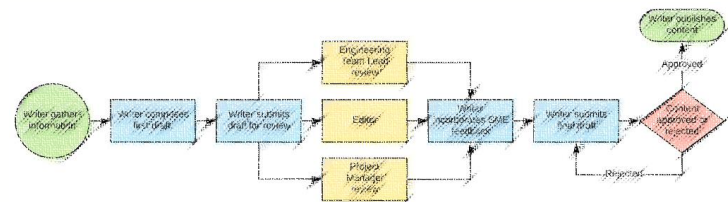
5C-2: Custom MP Develop/Update Workflow

Objective

- Formal workflow and process for developing, reviewing, and updating SW Custom Measures and Tools

Approach

- Adapt deemed MP workflows to custom
- Seek CPUC buy-in to provide input and review proposed SW custom measures and tools



Deliverables

- Custom Measure Package Development and Update Workflow, presented to TF for affirmation
- Assessment of potential to implement approved workflow in eTRM

5D: Update eTRM Documentation

103

- Objectives:
 - eTRM documentation as needed to support custom measures and resources in the eTRM

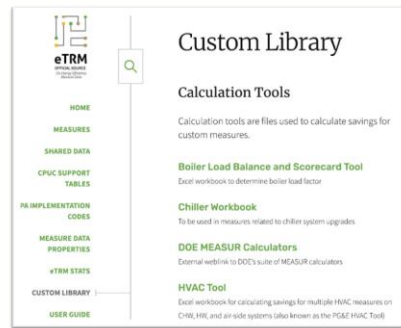
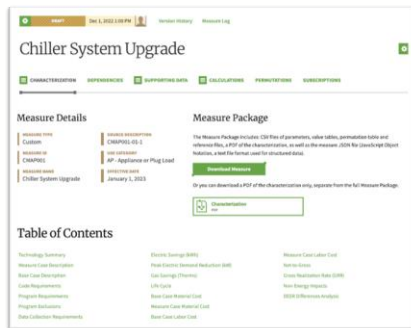
- Deliverables:
 - eTRM Custom Measure Characterization Template
 - TBD based on 2023 Enhancements

5E: eTRM Implementation

104

5E-1: eTRM Custom Phase 1

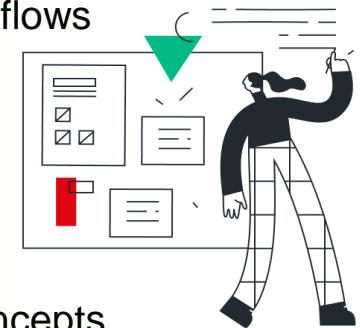
- **Objective**
 - Custom Measures
 - Custom Library



- **Deliverables**
 - Functional specifications and wireframes (**Complete**)
 - Implement eTRM Custom Phase 1 (TBD)

5E-2: Additional eTRM Custom Modules

- **Objective: Leverage the eTRM for Custom**
 - Data intake
 - Calculations
 - POU tools
 - Develop custom projects
 - Project review workflows



- **Deliverables**
 - Custom module concepts
 - Custom eTRM Visioning Charrette
 - Business requirements and functional specifications for select modules (TBD)

Closing / Next Steps

105

- No meeting in August
- Reserve time for the Data Charrette, Sept 28th
- Contact Ayad if you want to be involved:
 - Measure Property Data review of HVAC drafts
 - Communication meetings (and not already listed)
- Surveys / Feedback:
 - Complete custom tool prioritization by **July 28th**.
 - Complete ISP survey by **Aug 9th** if you have this experience.
- Contact Arlis/Spencer regarding:
 - For the Detailed Policy Review, what are your recommendations of areas of focus?
 - Are there additional mission critical policy items to add?
 - Additional thoughts on tool maintenance