

Cal TF Custom Subcommittee Meeting #9



CALIFORNIA
TECHNICAL FORUM

JUNE 7, 2023

Agenda & Goals

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- **Meeting Agenda**

- Workplan Updates (10 mins)
- 5A-1 Policy Resources (30 mins)
 - ✦ **Discuss:** Stakeholder input on policy resources; challenges; recommendations
- 5C-1 Statewide Custom Measures
 - ✦ Status update on SW Measure Characterizations (30 mins)
 - ✦ **Discuss:** [M&V Rigor Level Pilot Document](#) (30 mins)
 - ✦ **Discuss:** Measure-specific guidance on POE within Measure Characterizations (15 mins)

- **** July 5 meeting rescheduled to July 12****

- **Meeting Goals**

- Stakeholder input on statewide custom policy resource summary (5A-1)
- Update/engage Subcommittee on measure-specific efforts (5C-1)
- Improve stakeholder awareness and understanding of M&V Rigor Level Pilot document
- Stakeholder input on measure-specific POE guidance

Custom Initiative – Status

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Metric	Activity/Task	Status Update	Upcoming
5X	Custom Initiative Workplan	-	-
5A-1	Regulatory Summary & Review	Discussing approach today	Request for stakeholder input to complete library of resources/guidance, identify questions/challenges
5A-2	SW Custom Measure ID	Conducting follow-up meetings with PAs	Updated SW Measure Code Structure (July)
5A-3	List of Measures for SW Custom Measure Packages	Cal TF Staff compiling measure list (claims and CPR data)	Stakeholder input to identify/prioritize measures for SW standardization
5A-4	List of Custom Tools	Cal TF Staff compiling list of existing tools	Stakeholder input to identify/prioritize tools for updating and development
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 Boilers, RCx, Chiller Systems, Pump Systems in progress	Steam Boiler MP Affirmation (July) Other measures upcoming for stakeholder input
5C-2	Custom MP and Tool Development Workflow	Cal TF Staff developing proposal based on stakeholder input from May meeting	Subcommittee review/affirmation on proposed SW process (July)
5D	eTRM Documentation	Custom Measure Characterization template	TBD based on eTRM priorities
5E-1	eTRM Custom Phase 1	Custom Library development in 2024 Q1; Custom Measures for future development	Implementation pending eTRM enhancement priorities
5E-2	Future Custom eTRM Modules	Discussing disposition database and CMPA	eTRM 101 Training
6B	White Paper: ISP	-	Stakeholder Survey

Blue text = status updates

Quick Updates

Custom Initiative &
Workplan Updates

- List of Custom Tools (5C-1)
 - Upcoming: call for stakeholder input on tool needs/priorities
- ISP White Paper Update (6B)
 - CPUC Update on ISP Guidance v3.1
 - Upcoming: Stakeholder Survey
- CAEnergyGuidance.com
 - Question: How are you using the Disposition Database? Are the redacted dispositions helpful?
- October 26 TF meeting will focus on Custom (SoCalGas ERC, Downey)

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 and 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.



List of Custom Tools (5A-4)

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- Tool sources
 - CPUC/IOU Custom Tool Archive (CTA)
 - Custom Subcommittee Tools List
 - POU Measure Workbooks
 - 2013 Customized Calculation Tool
 - CPUC Custom Team input
- Characterizing list
 - Considerable overlap or obsolete
 - Categorizing by end-use or activity
 - Proprietary
- Stakeholder input
 - Specific questions
 - Recent use in approved project
 - Rating in interest for prioritization
 - Updates needed?
 - ✦ T-24 baselines
 - ✦ Non T-24 baselines
 - ✦ Policy updates
 - ✦ Calculation assumptions
 - ✦ Other

ISP White Paper Update (6B)

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- Stakeholder Survey
 - Objectives
 - ✦ Inform current state
 - ✦ Understand stakeholder use of existing resources
 - ✦ Determine potential clarifications of existing resources
 - ✦ Prioritize potential improvement ideas
 - Status
 - ✦ Working through final language edits
 - White paper team may follow up to get details after survey

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
- **Deliverables**
 - Summary of custom regulatory resources, policy, and guidance resources
 - Proposal to improve approach to summarizing and providing clear guidance on custom measures, projects, and tools.

Discussion Questions

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- How to you stay informed and up-to-date on custom policy/guidance (e.g., what resources, approach)
 - Formal Decisions/Resolutions
 - Additional policy guidance, clarifications, etc.

- What works well?
 - PA communications – better if rolled into a single, accessible source of running updates (so stakeholders don't need to search through distinct past documents)
 - ✦ PG&E Wiki & EE Monthly Communication (digest of key updates)
 - ✦ SCE EPPICs document

Discussion Questions

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- What ideas/recommendations do you have to improve awareness, access, understanding, applicability, clarity, etc.?
 - Up-to-date, accessible SW Guidance Document or Wiki
 - Centralized, accessible running list of policy, guidance, interpretations (updated on ongoing basis)
 - ✦ Could be fed from PA digests
 - Digest of relevant disposition findings with key information, provided in timely manner (PG&E has started this, available to Wiki users; “Ex Ante Review Takeaways”)
 - Need to be able to track/reference projects across guidance/resources
 - Improve Ex Ante and Ex Post alignment/consistency
 - *Needs to be a resource/process to maintain resources up to date
 - *Need method for more consistently sharing across PAs, broader stakeholders
 - Make CPR Disposition comments more clear – identify issue and provide solution

Discussion Questions

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- What specific questions do you have about custom policy/guidance?

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 affirmation

Custom Measure Characterization

Statewide Measure Packages

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- Boiler Efficiency
 - Target July TF meeting
- Retrocommissioning
 - Target September TF meeting
- Chiller System Upgrade
 - Target October TF meeting
- Pump Systems
- VFD on HVAC Fans (POU)

- All materials accessible on the SharePoint [Custom Measure Library](#)
- Email Spencer.Lipp@futee.biz to join working group(s).

SW Custom MP Approach

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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
 - Add comments directly in [Measure Characterization doc](#) OR email comments to Steven.Long@icf.com and spencer.lipp@futee.biz
- 7/12 - Custom Subcommittee affirmation
- 7/27 – Cal TF affirmation
- TBD – CPUC approval

Steam Boiler Measure Package

Materials

- [Measure Package](#)
 - [Measure Characterization](#)
 - 3 tools:
 - ✦ [Load Balance and Score Card Tool](#)
 - ✦ [Flue Gas Efficiency Calculator](#)
 - ✦ [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

Steam Boiler Measure Package

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- Largest steam boilers not covered by deemed MPs
- NR and AR cases, C/I/A
- Addresses baseline determination methodology (not a fixed %)
- Leverages three tools for calcs
- Only applies to retrofit cases, no major size change, > 15psig
- Has detailed M&V requirements

Looking Forward: Boiler Related Measures

- Economizer(s) (>20 million BTUH input) #1
 - Feedwater
 - Non-condensing
 - Other new approaches to consider- Direct-contact stack heat recovery, different form factors
- Blowdown Heat Recovery to Preheat Feedwater (#2)
 - Lower Usage:
 - ✦ Automated blow down controls
 - ✦ Incremental water treatment/controls/RO
 - Heat recovery
 - ✦ Preheat feedwater
 - ✦ De-aerator
- Others:
 - Controls:
 - ✦ Parallel positioning
 - ✦ O2 Trim controls - may require replacement of positioning controls (AR, SP?)
 - Burner retrofit (TBD)
 - VFD/ Blower controls (TBD)
 - Possible reset controls (TBD)
 - Install automated blowdown controls/HR
 - Combustion air pre-heat (not for meeting AQMD)
 - Water Treatment/chemicals/RO (lowers blow down rate)

Discussion/Questions

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- Custom Steam Boiler MP:
- Steam Boiler Related Measures:
 - Which are in greatest need (steam first)?
 - Which are most likely to get approved?
- Other

RCx Measure Package Overview

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- ~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

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- 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

Chiller Measure Package Overview

- ~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

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- Excellent draft Measure Characterization
- Outstanding components for discussion
 - Finalize measures (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 (part of today's discussion)
 - Inclusion of POE requirements (part of today's discussion)
 - Applicability of host or host proxy for AOE EUL

M&V Rigor Levels

- Objective: Obtain input on the appropriate M&V based on rigor level in the Custom Measure Characterizations
- [CPUC M&V Rigor Level Pilot Document](#)

Custom Measures M&V Rigor

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- Objective: Get input from Custom subcommittee on appropriate M&V rigor level
- Common issue for all custom Measure Characterizations

The determination of savings is uncertain because savings represents the absence of energy use and cannot be directly measured. Page 57

A best practice is to minimize the cost associated with the level of data collection and analysis rigor in comparison with the expected benefit. Page 58

IPMVP

M&V should incur no more cost than needed to provide adequate certainty and verifiability in the reported savings. Page 56

Typically, average annual M&V costs should be less than 10% of the average annual cost savings being assessed. Page 59

Breaking down the M and the V

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- Verification = potential to perform
 - Measures were installed
 - Installation meets reasonable quality standards
 - Measures are operating correctly and have the potential to generate predicted savings
- Measurement = determination of actual performance
 - Measurements of some parameters (Option A)
 - Measure of all parameters (Option B)
 - Whole facility (Option C)
 - Calibrated simulation (Option D)

California Evaluation Framework. Pages 161-181. https://www.cpuc.ca.gov/-/media/cpuc-website/files/uploadedfiles/cpuc_public_website/content/utilities_and_industries/energy/energy_programs/demand_side_management/ee_and_energy_savings_assist/caevaluationframework.pdf

BPA M&V Protocol

- Two principles of M&V
 - To verify that the intended changes to the facility were made, and that those changes have the ***potential to perform*** as intended and save energy.
 - To measure and document the ***actual effects of a project*** (i.e., energy and demand savings) and determine whether it met its ex-ante estimates.
- Verification
 - Potential to perform is right equipment installed and operating properly
 - All projects
- Measurement
 - Actual performance
 - Rigor determined by savings level with consideration of M&V costs, M&V duration, safety requirements, and other factors.

BPA Measurement & Verification (M&V) Protocol Selection Guide and Example M&V Plan. Section 2 <https://www.bpa.gov/-/media/Aep/energy-efficiency/measurement-verification/1-bpa-mv-selection-guide.pdf>

CPUC Subgroup M&V Pilot

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- Year long effort in Streamlining Small Projects CPUC subgroup
- Participants included CPUC, CPUC ex-ante consultants, all four IOUs, and Implementers
- Focus on Very Low ($\leq \$7,500$ incentive) and Low ($\$7,500$ - $\$25,000$ incentive)
- Redlined PFS template with M&V instructions was issued for pilot by CPUC in October 2021
 - Referenced Verification objectives from CA Evaluation Framework
 - Used 10% of the incentive as a basis for M&V cost

CPUC Subgroup M&V Pilot – VL Rigor

- Verification requirements
 - Itemized invoice
 - Photo images of the installed equipment for M&V verification objectives
 - Updated system/line diagram, if available
 - Verification of production, occupancy, or other key variables with documentation (email, screenshot or picture, as applicable)
 - Verification of operation hours (email, screenshot or picture, as applicable)
 - Product specification documentation, as applicable
 - Verification of the removal or abandonment in place as required for the measure.
- Performance measurements
 - “Generally not required” when stipulated values are approved.
 - When specific conditions can be spread across multiple project submissions, the cost of M&V should consider all of those projects with a sampling approach to measurements.

CPUC Subgroup M&V Pilot – Low Rigor



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- Verification requirements
 - Same as Very Low
- Performance measurements
 - May be reduced when stipulated values are approved.
 - Typical performance measurements:
 - ✦ Control system screenshots used to verify operational parameters such as control setpoints, operating hours, equipment sequencing, etc.
 - ✦ Spot measurements or pre- and/or post-installation short term data logging of installed or affected equipment, operation or other key variables.
 - Consider the value of effort in terms of increased savings accuracy in consideration of the M&V budget (10% of incentive)

M&V Questions for the Group

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- Considering the custom initiative measures and the goals of the Custom Measure Characterization, is a standard M&V guideline on verification and performance measurement by rigor appropriate?
- What M&V should be required for Very Low Rigor?
- Does this change when we go to Low Rigor?

Measure-Specific Influence/POE

- Objective: Obtain input on the appropriate level of detail for influence/POE in the Measure Characterizations

Measure Specific Influence/POE

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- Influence/POE is project specific. So, this cannot be
 - ❑ A checklist to success
 - ❑ “How to” recipe
 - ❑ Guaranteed or inferred eligibility
- It might include
 - ❑ Common POE attributes or suggestions for the measures or activity
 - ❑ Common potential POE pitfalls that may be existent for the measure or activity

POE Examples

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- **Boiler**
 - Attribute – Large boilers are often retubed and repaired rather than replaced. Overhaul records can help to show viability
 - Pitfall – Boilers may be replaced for non-energy reasons such as AQMD or process requirements. Confirm and document reasons for the replacement.
- **RCx**
 - Attribute – Measures are often overlooked by facility staff because the systems continue to meet space conditioning requirements. Document investigation activities and customer interactions to confirm the system is meeting space conditioning requirements and would likely to continue to operate inefficiently.
 - Pitfall – Large customers/organizations or astute facility personnel may perform ongoing, routine RCx activities. Document the customer's typical activities to ensure the program's activity is incremental to their typical procedure.

Wrap-Up & Next Steps

- **Action Items**
 - Questions and/or input on discussion items to Arlis.Reynolds@futee.biz and Spencer.Lipp@futee.biz
 - Upcoming: calls for input on policy resources, custom measures, and custom tools; ISP stakeholder survey
- **Next time (tentative)**
 - Steam Boiler Measure Package **for affirmation**
 - Workflow for SW Measure Packages and Tools **for affirmation**
 - Custom policy summary and recommendations
 - SW Custom Measure Codes
- **Upcoming Meetings**
 - TBD – eTRM 101 for Custom
 - Ongoing – Measure Group meetings
 - 6/21 – Cal TF Data Charette
 - **7/12 – next Custom Subcommittee Meeting**

Cal TF Data Charette

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- Wednesday, June 21, 10am – 5pm, PG&E HQ in Oakland
- Objectives
 - Shared understanding existing EE systems (capabilities/limitations)
 - Shared understanding of data needs/challenges from all stakeholder perspectives
 - Shared understanding of the data challenges/opportunities related to meeting various EE goals (e.g., savings, equity, market activity, grid management, etc.)
 - Identify data use cases and define “ideal state” to support EE stakeholders
 - Identify top 5 opportunities and/or strategies to address data challenges
- [Draft agenda](#)
- [RSVP for the June 21 Data Charette](#)

Open Discussion

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