

Hybrid Measures Overview



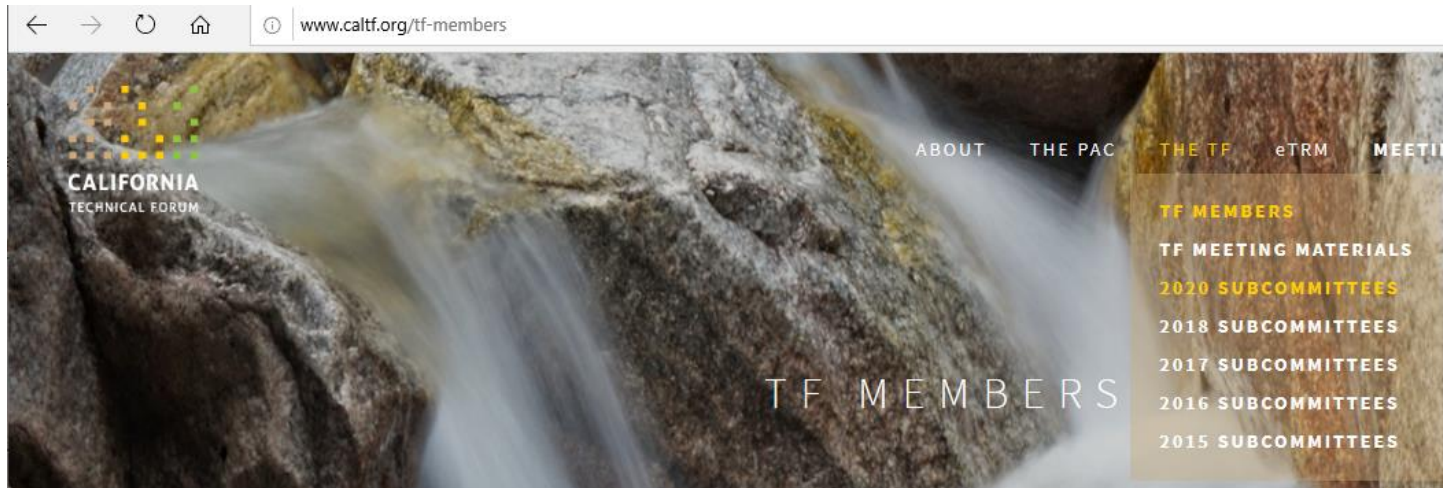
CALIFORNIA
TECHNICAL FORUM

AYAD AL-SHAIKH
APRIL 23, 2020

Quick Updates

2

- We will have a page on the Cal TF website that includes the meeting materials from this subcommittee



- DropBox link available for back-up materials

Agenda

3

- Subcommittee Overview
 - 4 Meetings; 33+ people on the distribution
 - ✦ IOUs, POUs, Implementers, CPUC Consultant, National Labs, Technical Reviews, CalTF Members
- Hybrid Measure Goals
 - Draft definition suggested
 - Example measures suggested and voted on
 - Types of Hybrid Measures
- Understanding Hybrid Measures
 - Example: Process Boiler
 - *Disclaimer: Only one example explored so far.*

***Ask: We are still early in the process; If you want to contribute to this effort, please contact me to join.
(typically meet every other Thursday, 12 – 2 pm)***

Hybrid Measure

4

- **Goals**

- For a discrete (but growing) number of measures, document a framework for how to submit the hybrid measure
- Clarity that the submittal is expected to result in packets that:
 - ✦ Provide deeper / more complete documentation
 - ✦ Require less review / oversight
 - ✦ Provide clarity and assurance on the approval process
- Captures data in a structured format that could:
 - ✦ Improve inputs over time
 - ✦ Result in converting the hybrid measure to a deemed measure
- Need standard process for application flow

Hybrid Measure

5

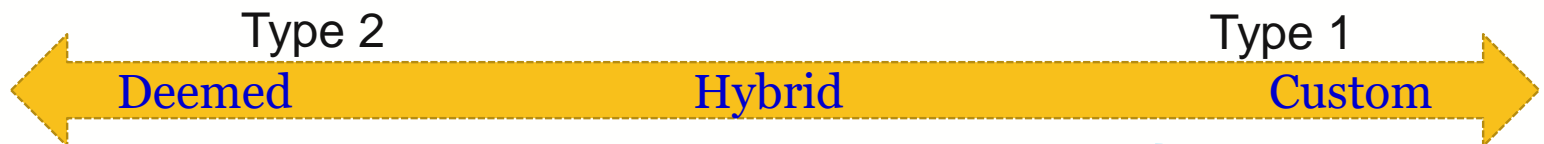
- Target Measure
 - Installed frequently, repeatably throughout the state
 - Enough clarity about the installation exists that there is acceptable trade-off between rigor and other important elements (reliability of the measure savings amount, persistence, double-dipping, gaming, etc.)
 - Clear relationship between impact parameters
 - Minimum and maximum project size or incentive amount could exist
 - ✦ Ideally streamlined approach can reduce the minimum threshold of savings for accepting a project
 - ✦ Alternatively, more stringent “voluntary” M&V could increase the maximum incentive below which custom program review can be streamlined/waived

Hybrid Examples

6

• Example Types

- Type 1: Today, measure considered to be custom
 - ✦ Calculation methodology generally accepted
 - ✦ Baselines generally accepted for various building types / customer sizes
 - ✦ Savings may vary significantly based upon one or more sensitive variables
 - ✦ Reasons for installation generally understood
- Type 2: Today, measure considered to be deemed
 - ✦ In addition to Type 1 notes, special cases exist that are not included in deemed methodology
 - Excluded based upon project size (ie, Norm Units out of appropriate range)
 - Target market or delivery channel may not be included or possible
 - POU only measure



□ *Type 3: Approved Prototype Model*

□ *Type 4: Widget that documents its own energy usage*

*Won't
discuss
today*

Data Flow – Ensure Consistency (Strawman)

7



eTRM

TAKE ASSIGNMENT | You have a role in this measure and are permitted to make edits.

SWWH008-01 CPUC APPROVAL Apr 9, 2020 5:35 AM Version History

Boiler, Process

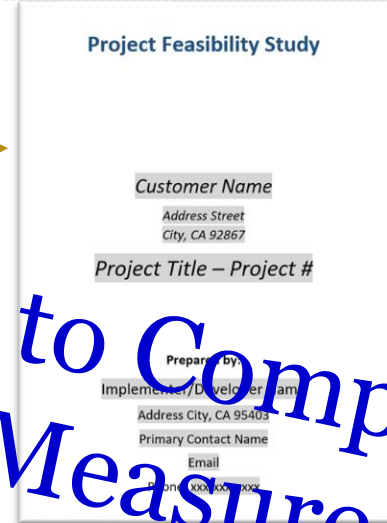
CHARACTERIZATION OPPORTUNITY ANALYSIS CALCULATIONS PERMUTATIONS

Table of Contents

Technology Summary	Electric Savings (KW)	Base Case Labor Cost (\$/Unit)
Measure Case Description	Peak Electric Demand (KW)	Measure Case Labor Cost (\$/Unit)
Base Case Description	Gas Savings (Therms)	Net Savings
Code Requirements	Life Cycle	Gross Savings Incentive Adjustment (GSA)
Program Requirements	Base Case Material Cost (\$/Unit)	Non-Energy Impacts
Program Exclusions	Measure Case Material Cost (\$/Unit)	DEER Differences Analysis
Data Collection Requirements		

Technology Summary

A process boiler is a pressure vessel that transfer heat to water for manufacturing. In most boilers, a heat exchanger separates the combustion products from the water. Boilers can be configured as an integrated packaged boiler, or, in some cases, the boiler (which may resemble an instantaneous water heater) may be connected to a



Project Feasibility Study

Customer Name

Address Street
City, CA 92867

Project Title – Project #

Prepared by:
Implementer/Developer Name
Address City, CA 95403
Primary Contact Name
Email
Phone: xxx-xxx-xxxx

Project Feasibility Study

Feedback: Still to Complicated for a Hybrid Measure



Post-Installation Report

Customer Name

Address Street
City, CA 92867

Project Title – Project #

Prepared by:
Implementer/Developer Name
Address City, CA 95403
Primary Contact Name
Email
Phone: xxx-xxx-xxxx

Post-Installation Report

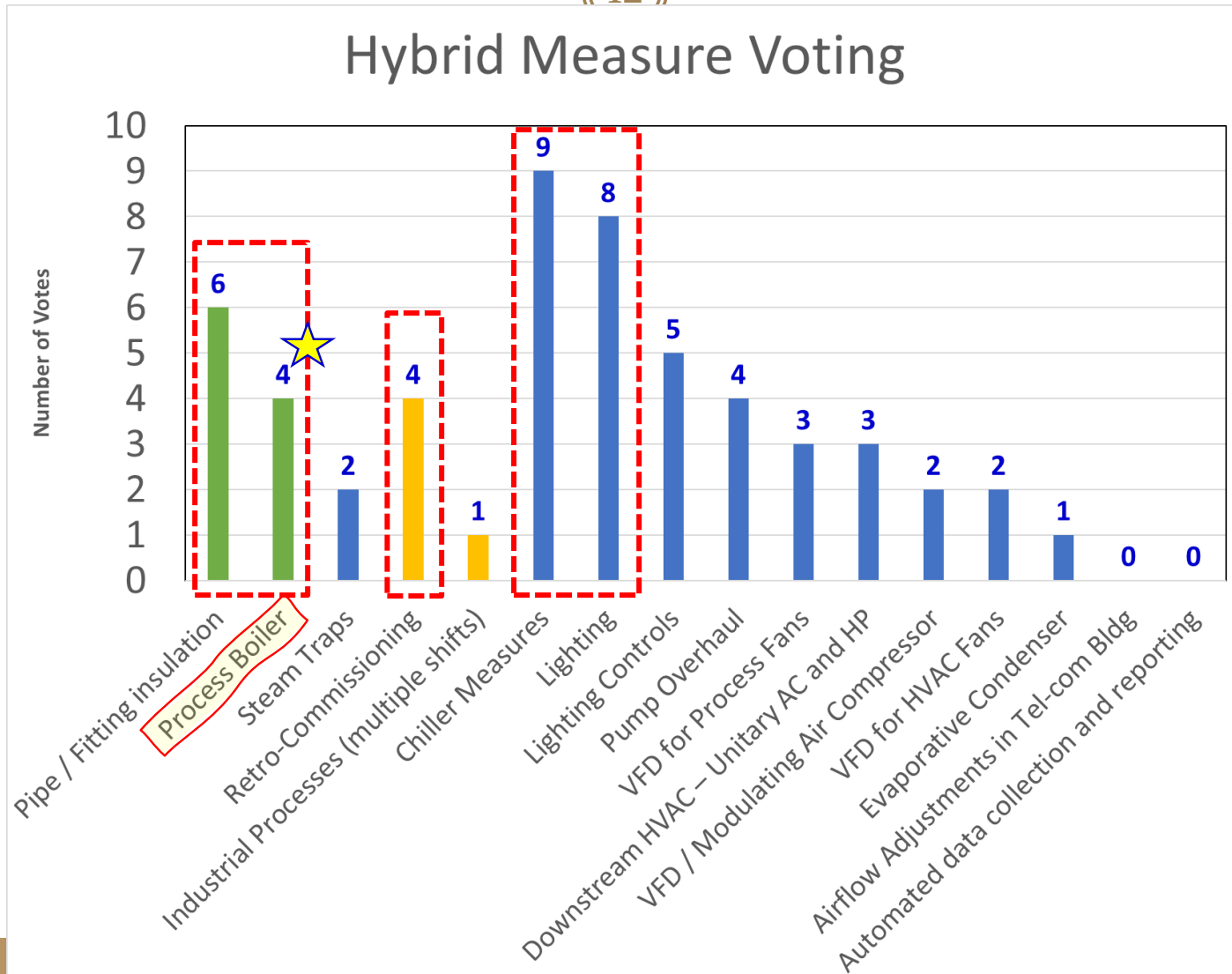
- Measure describe in eTRM
- Statewide report templates generated / downloaded

LADWP Hybrid Measure Data - 2019

CPP Measure	Sum of Annual kWh	Sum of kW	Measures	Average kWh
		Savings		
Chiller Performance Upgrade - Screw/Scroll Air Cooled Chiller	537,846	42.4	9	59,761
Chiller Performance Upgrade - Screw/Scroll Water Cooled Chiller	468,231	102.7	4	117,058
<i>Lighting Fixture Replacements - Interior Lighting</i>	<i>895,634</i>	<i>137.6</i>	<i>16</i>	<i>55,977</i>
<i>Lighting Lamp Replacements - Parking Garage Lighting</i>	<i>28,521</i>	<i>3.3</i>	<i>1</i>	<i>28,521</i>
Refrigerated Walk In Motor Performance Upgrade - Cooler Evaporato	20,571	62.1	12	1,714
Unitary HVAC Performance Upgrade - Mini-Split HP	4,917	10.0	1	4,917
Unitary HVAC Performance Upgrade - Package Terminal HP	24,422	12.6	1	24,422
Unitary HVAC Performance Upgrade - Packaged A/C	1,105,379	332.0	15	73,692
Unitary HVAC Performance Upgrade - Packaged HP	31,713	10.0	1	31,713
Variable Speed - HVAC Supply/Return Fan	702,457	127.5	15	46,830
Variable Speed - Process Fan	6,989	4.0	1	6,989
Variable Speed - Pump Condenser Water	109,814	-	1	109,814
Variable Speed - Pump Swimming Pool	30,896	77.2	4	7,724
Vending Machine Controls - Vending Machine	9,655	1.6	1	9,655
Window Film - Building Envelope	26,409	-	1	26,409
Zone Thermostat Programming Performance Upgrade - All Areas	219,995	10.0	2	109,998
Grand Total	4,223,449	933.00	85	

Voting on Potential Measures

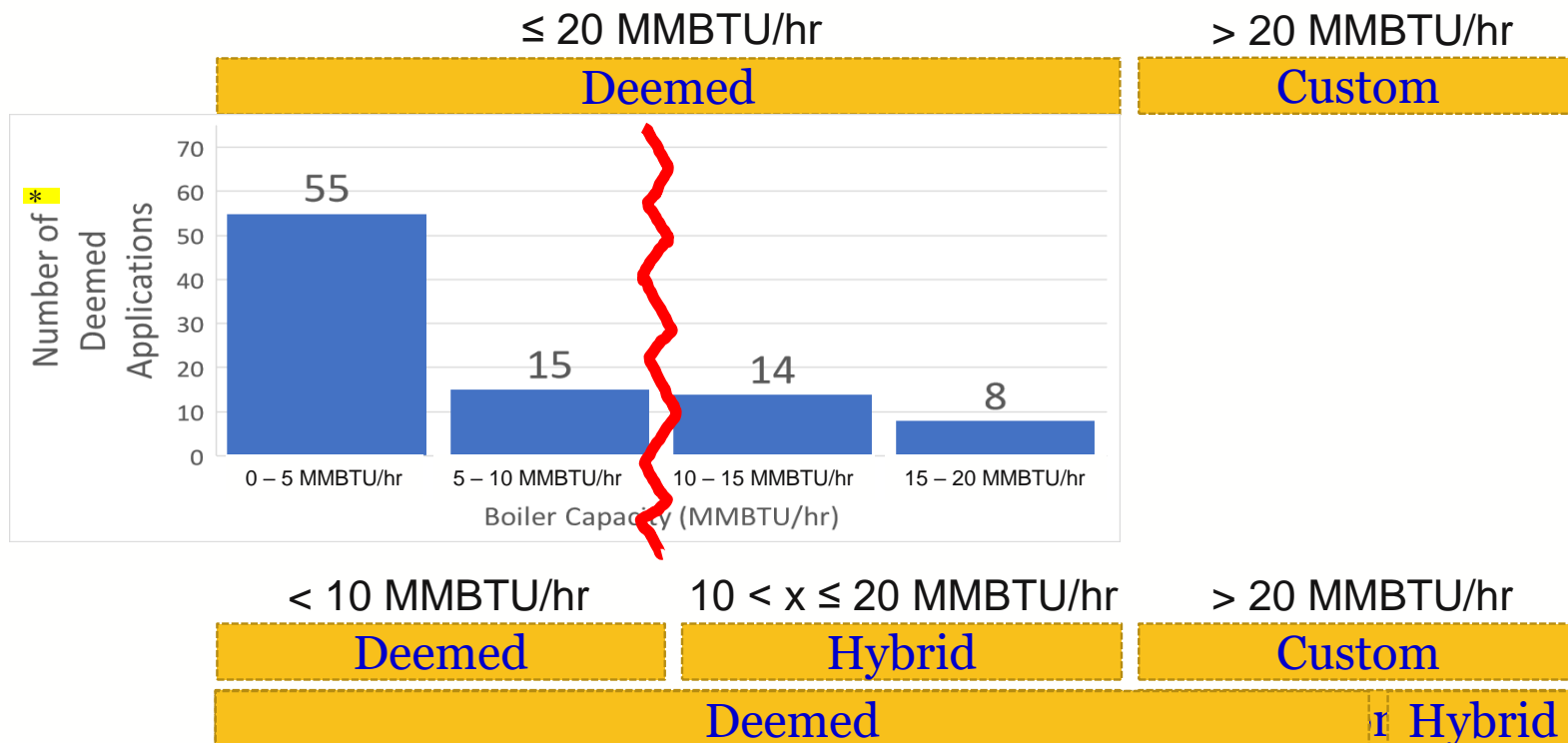
12



Type 2 – Deemed Measure (Strawman)

13

- Example that I wanted to show was the process boiler
 - Deemed Measure: SWWH008 Process Boiler (≤ 20 MMBTU/hr)



- Deemed: $\frac{3}{4}$ of the applications are $\frac{1}{3}$ of the savings
- Hybrid: $\frac{1}{4}$ of the applications are $\frac{2}{3}$ of the savings

Potential Process

14

$$UEC_{base} = \frac{\text{Rated Load} * LF * opHr}{Eff - base}$$

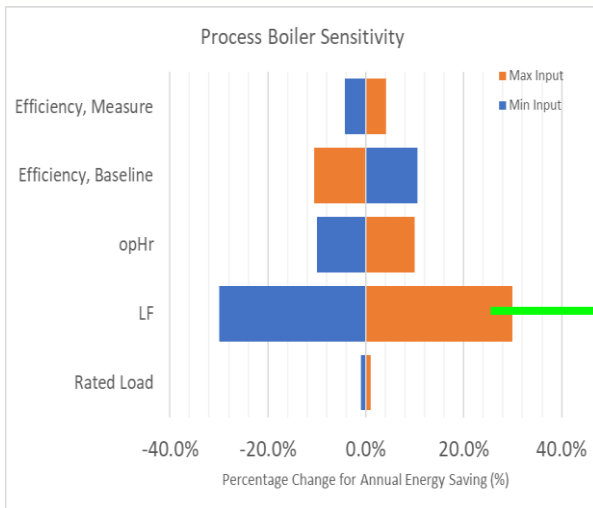
- Basic Calculation
- Deemed: Capacity of ≤ 10 MMBTU/hr
 - 1 – sensitive variable (Norm Unit = **Rated Load**)
- Hybrid: Capacity of $10 < x \leq 20$ MMBTU/hr
 - 2 – sensitive variables
 - ✦ **Rated Load** (from specification sheet)
 - ✦ Calibration = **LF * opHr** (from customer input in Load Balance Tool)
 - LF = Load Factor (%); opHr = Annual Operating Hours (hrs/yr)
- Goal
 - Larger project that could have more risk would include a second variable to limit risk

Background Thinking

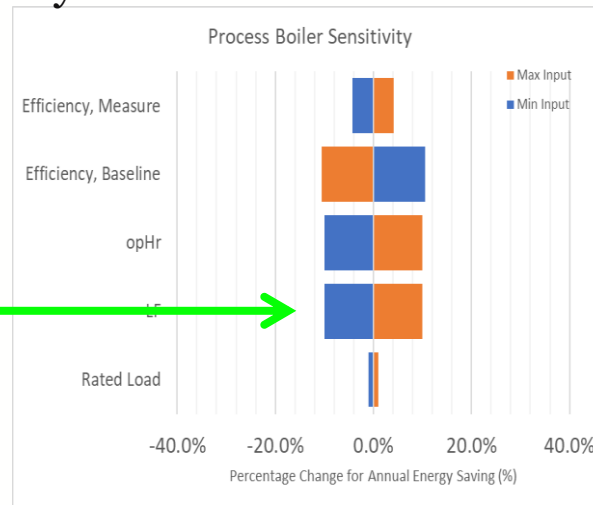
15

- Tighten bound of a second (or third) sensitive parameter
- Improve savings for larger projects by narrowing the distribution of savings

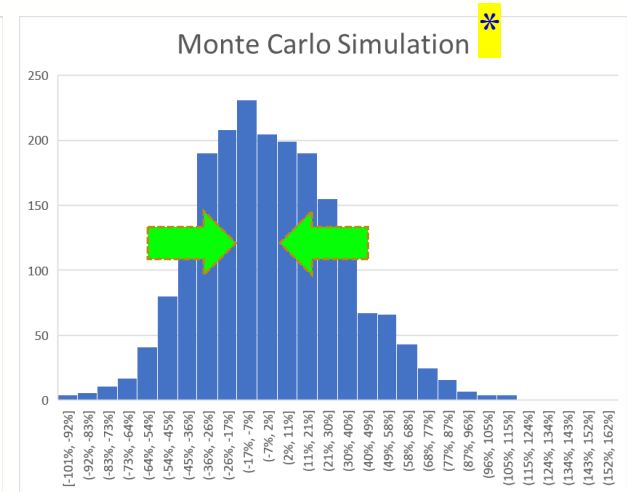
Deemed



Hybrid



Monte Carlo Simulation



* Borrowed from RTF calculations.

Type 2 – Deemed Measure (*Strawman*)

16

- Example of the process boiler
 - Deemed Measure: SWWH008 Process Boiler (≤ 20 MMBTU/hr)

< 10 MMBTU/hr	$10 < x \leq 20$ MMBTU/hr	> 20 MMBTU/hr
Deemed	Hybrid	Custom

- Submittal Package
 - Deemed measure needs to show proof of purchase and document capacity (ie, invoice).
 - What should a Hybrid application look like? Should it vary by measure, project size, etc?
 - ✦ Important to balance:
 - Maximizing rate payer funds
 - Ensuring savings accuracy

Next Steps

17

- Next subcommittee meeting: **Planning for May 7th**
- Discuss:
 - Look at a second/third example...if we can get project data.
 - What would be included in an application?