Agenda

California Technical Forum (Cal TF) Meeting

April 23, 2020

Location: Teleconference Only

1:00 p.m. – 2:30 p.m.

3:00 p.m. – 5:00 p.m.

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Time	Agenda Item	Discussion Leader(s)
1:00 - 1:15	**Opening**	Ayad Al-Shaikh
1:15 – 1:45	**Hybrid Measure Status** • Definition and Goals • Subcommittee Process (status) • First Measures and Voting • Next Steps **ACT:** • Get feedback	Ayad Al-Shaikh
1:45 - 2:30	**Modeled Measure Documentation** **ACT:** • Get feedback. • Decide if a subcommittee should be established.	Ayad Al-Shaikh

2:30 – 3:00 Break

Time	Agenda Item	Discussion Leader(s)
3:00 - 3:20 3:20 – 5:00	**Technical and Policy Issues** • **Overview** • **Whitepapers (Final Short List)** ○ Fuel Substitution Measures ○ EE Bundled Measures ○ EE+ DR Bundled Measures ○ Policy Guidance for Load Shapes ○ Classification of a Measure as ET vs Custom vs Deemed **ACT:** • Feedback and next steps for subcommittees.	Jennifer Holmes Champions

Meeting Materials

- **Meeting Decks**
  - Cal TF Meeting White Paper Topics 04.2020 with Topic Slides
  - CalTF Modeled Measures 04-2020 r2
  - CalTF Hybrid Measure Update

- **For Information**
  - White Paper Topic - Fuel Substitution Measures 2020.04.17
  - White Paper Topic - Bundled EE Measures 2020.04.17
  - White Paper Topic - Bundled EE & DR Measures 2020.04.17
  - White Paper Topic - Policy Guidance for Load Shapes 2020.04.17 r2
  - White Paper Topic - Measure Classification 2020.04.17
  - SW Modeled Measure Savings Methodology Template v4.3

Meeting Attendees

	In-Person	*Via Telephone*
Cal TF Staff		Ayad Al-Shaikh Jennifer Holmes Cameron Assadian Chau Nguyen Tomas Torres - Garcia
Cal TF Members		Abhijeet Pande Akhilesh Endurthy Pierre Landry Steven Long Sepideh Shahinfard Alfredo Gutierrez Armen Saiyan Charles Ehrlich Dave Hanna Douglas Mahone Ed Reynoso Eric Noller Gary Fernstrom Jay Madden Jeffrey Seto Jonathan Pera Lacey Tan Martin Vu Mudit Saxena Chan U Paek Richard Ma Scott Blunk Tom Eckhart Vrushali Mendon Christopher Rogers George Beeler Randy Kwok Marc Costa Mike Casey
Non-Cal TF Members		CPUC Amy Reardon / CPUC Peter Biermayer / CPUC CEC Aida Escala / CEC Cynthia Rogers / CEC Anne Fisher / CEC Fritz Foo / CEC Nicholas Janusch / CEC Laith Younis / CEC Ingrid Neumann / CEC Gavin Situ / CEC

	In-Person	***Via Telephone***
		CPUC Consultant Bing Tso / SBW Bob Ramirez / DNVGL Rachel Murray / DNVGL Saroj K. / ERS Sue Haselhorst / ERS IOU Henry Liu / PG&E Adan Rosillo / PG&E Anders R Danryd / SCG Cassie Cuaresma / SCE Implementer / 3P / Consultant Angela Crowley / RMS Bryan Boyce / Energy Solutions James Hanna / Energy Solutions Carol Yin / Yinsight Jay Luboff / Jay Luboff Consulting Kyle Dunn / MWE2

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TECHNICAL FORUM

Meeting Notes

I. Opening

Presenter: Ayad Al-Shaikh

II. Hybrid Measure Status

Presenter: Ayad Al-Shaikh
Materials: CalTF - Hybrid Update - 04-2020 - r3.pdf

Quick Updates

Doug Mahone: Hybrid measure files?

- Ayad Al-Shaikh: Posted on CalTF website.

Type 2 – Deemed Measure

Chan Paek: Deemed process boiler requires flue gas (FGA) analysis to verify the measure case efficiency. The customer may not need to provide any additional information beyond the deemed application.

- Ayad Al-Shaikh: This will be helpful; this can make the two categories blend much easier.

Charles Ehrlich: An issue to balance/avoid is “cherry picking” the data. If hybrid savings are greater than deemed savings then you would want to apply the hybrid approach, but if deemed are larger then you apply the deemed approach.

- Ayad Al-Shaikh: Good point, there are so many good questions with this. Custom tools can be created which are applicable to all measures. Good thing that we have the subcommittee with experts. For hybrid measures we want to address questions like that. Hybrid subcommittee meeting is every two weeks, next one is May 7th. In this case, we can need to be able to draw a line so that we clearly use the deemed or hybrid approach (rather than either).

Next Steps

Sue Haselhorst: Limitations in tracking systems may cause measures to fall into the hybrid framework, is this something that you are considering? If we have a Unit Energy Savings (UES) that you are reporting, the UES has a quantity it is a direct calculation; hybrid there is more than one parameter that defines the outcome. The current system does not have the capability to track more than one outcome, are you looking into that?

- Steven Long: This was brought up in the hybrid subcommittee meeting.
- Ayad Al-Shaikh: There might be ways around it, some of the variability will ultimately cause it to stay custom. The balance that we are trying to achieve is maybe have some flexibility from the hybrid side and simplicity from the deemed side.

ACT: Ayad to follow back up with Amy R. to explore potential issue with reporting.

- Chan Paek: We are not trying to touch anything on the custom side at this stage. We are focusing on the deemed applications that can go either way. If we assume that our deemed applications do not require any further tracking and we are not requiring anything, it would just be additional information for deemed applications; then there is more opportunity for CPUC. If hybrid approach works well then, we can expand to custom.
- Ayad Al-Shaikh: This may vary from measure to measure, as we look at other examples.

Gary Fernstrom: Moving some of these measures from deemed to hybrid will require some extra documentation relative to savings. Is there a conversation regarding what we spend on getting the details and if it is worth it if the measure is small?

- Ayad Al-Shaikh: Right now, we are starting from the deemed applications to see if this can be done, but the goal is to get more custom measures as deemed. What is the right level of risk attributed to savings? Let me know if you have a suggestion. Right level of risk for savings is an important consideration.
- Gary Fernstrom: Look at our current practice, some implicit policy around that, it will be interesting to understand how that works now.
- Ayad Al-Shaikh: Good point. Importance of rate payer dollars need to be maximized. We will investigate this. I will follow up with you.

ACT: Follow up with Gary F. to understand if he has ideas on how risk can be assigned to projects. What is the appropriate level of risk to take?

Cassie Cuaresma (via Chat): I'd like to offer some thoughts on hybrid measures: 1) There is no CPUC recognized ex ante review process for "hybrid" measures. If hybrid means that the measure's savings is dependent on a site-specific analysis of a customer site, D1107030 defines these measures as customized. I suggest that the sub-team assess regulatory direction to determine appropriate ex ante path for "hybrid" measures. 2) One feasible option is to structure deemed measures based on the variable factor. If the variable factor is operating hours, perhaps there are multiple deemed measures for a given range of operating hours. However, this approach would also require thoughtful consideration of how the program administrator can verify the variable factor. I have to drop off, but thanks for the overview on hybrid measures!

III. Modeled Measure Documentation

Presenter: Ayad Al-Shaikh
Materials: CalTF -Modeled Measures 04-2020 r3.pdf

Overview

Akhilesh Endurthy: For most DEER Modeled measures we take the savings from DEER but we take costs from other places because most DEER costs are older from 2016/2017, are these still DEER Modeled? Can we call DEER Scaled, DEER Modified instead?

- Ayad Al-Shaikh: Yes, this is a better description. Regarding your cost comment, we are specifically only talking about the energy savings so I do not think that will apply but we will keep this in mind when we update the document.

Model Definition

Bob Ramirez: What are you trying to do with this information? We must clarify. What you document depends on why you need the information and what you want to do with it.

- Jay Madden: All but the simplest measures you are going to have imported savings from DEER, right now all inputs, outputs and eQUEST model files are attached to a reference tag in the eTRM. We have simple calculations and have what was used to come up with these values. Is this where you are going with this?
- Ayad Al-Shaikh: I think we must be really clear; the real goal is transparency. At the lowest level, transparency of providing details would allow you to reproduce the value. There is an intermediate level, where people who can understand the construction of the measure can comment on the savings if they wanted to – based upon experience.
- Steven Long: The weighting factors and version associated with these (Continued on References, Slide 13)
- Jay Madden: (Circling back from References slide, Slide 12) Is this what Steven was asking? Would you be looking for weighting on the thermostats or something else?
- Steven Long: Building type, vintage and climate zone more necessarily. Interested on how savings estimates are reduced in quality.
- Armen Saiyan: How would we expose the weighting data in these tables?
- Steven Long: Either here or in the characterization, I do not think that the tables used for weighting savings would change from measure to measure.
- Armen Saiyan: The break down should be included. If weighting data was chosen to be collapsed the weighting factor should be stated.
- Ayad Al-Shaikh: Weighting methodology is always there – but tables are big, is there a better way to convey the information? The eTRM is built around providing different levels of information. The base level is included for understating the weighting calculation now. Any other examples would be very valuable.

Ayad Al-Shaikh: Any thoughts on documenting keyword modification?

- Steven Long: For case 1, is the prototype defined some where so that someone would know if you are not addressing certain features (ex. Economizer)?
- Ayad Al-Shaikh: I need to reach out to the EAR team on how to document prototypes.
- Rachel Murray: We are trying to document prototypes now, see DEER scoping memo that will help people understand our priorities for the year.
- Ayad Al-Shaikh: I will circle back with your team.

ACT: Circle back with Rachel M and her team to understand how prototypes documentation can be included in the eTRM.

- Jay Madden: It will be worthwhile to have a subcommittee on this rather than seeing it on a larger presentation. Would be very helpful to walk through examples in more detail.
- Ayad Al-Shaikh: Let us give people a couple weeks to send comments and I will put together a meeting with people interested. Reach out to me if you are interested. Meeting will be sometime in mid-May. Goal is to get a final draft out by next month's CalTF meeting.

ACT: Ayad will set up a meeting to discuss revisions suggested to the guidance document and also to walk through examples in greater detail

References

- Ayad Al-Shaikh: (From discussion on Measure Definition slide) The question is: "is this all that we want to include or are there other files that we want to include." 8760 load profiles and other documentation?
- Bob Ramirez: The post processing that goes into this, this will have to be documented, somewhere there must be some code. When we review, we would love to be able to run these. Transparency is the goal. There are also load related issues.
- Ayad Al-Shaikh: Question to the group, what other documentation should be included? One example, all examples? Weighting factors? Should the weighting file be standardized so that it is clear how things are done?
- Steven Long: As I recall the way that DEER is structured there are exceptions by climate zone, "Calibration Factors" some of the factors should probably be more uniform and there should not be any exceptions.
- Ayad A-Shaikh: I will have to investigate this. IOU-modeled measures use a standard weighting tool and done in a mechanical way; Bob was referring to the script used to combine savings in DEER. But having structured documentation will help us see where we need more information.
- Adan Rosillo: I would be happy with hourly load results and tables summarizing savings.
- Ayad Al-Shaikh: Should there be some visualization of the savings?
- Adan Rosillo: Typically, what we request is the summary table with the savings, if they are in a graph or a simple table, we need the savings to check them out and see if they make sense.
- Ayad Al-Shaikh: This will also show you the outliers, there are usually a lot of modeled results and it is tough to catch outliers when the measures are big (Circle back to Model Definition slide).

IV. Whitepapers (Final Short List)

Presenter: Jennifer Holmes, Jay Madden, Abhijeet Pande, Martin Vu, Armen Saiyan, Sepideh Shahinfard
Materials: Cal TF Meeting White Paper Topics 04.2020 with Topic Slides.pdf

Fuel Substitution Measures

Gary Fernstrom: It is important to understand and consistently implement policy.

- Steven Long: What is the baseline for the fuel equipment? What is the source of the heat rate? How do we make sure that everyone is using the same data heat rate for inputs
- Jay Madden: SCE has fuel measures; baseline is the code compliant equipment. Makes more sense than the prior approach but I think the measure must be above code electric; I have to check. Heat rate changes, declines over years (upward spike when Diablo Canyon is offline), what we can do on the subcommittee is give the link so that people can look at that.

- Akhilesh Endurthy: Per the Fuel Sub Technical Guidance, Accelerated Replacement measures application types are allowed, which will be using existing baseline. The baseline for fuel substitution should be similar to other EE measures.
- Gary Fernstrom: The heat rate needs to be seasona and time dependent, so that we get credit for various productions (especially solar) and for achieving the environmental outcome.
    - Abhijeet Pande: To Gary's point, the guidance talks about future improvements to include hourly analysis. Timing on this should be part of subcommittee.
    - Scott Blunk: And monthly, but also per utility supply mix
- Scott Blunk: What about natural gas leaks?
    - Jay Madden: Yes, should be incorporated.
- Scott Blunk: CEC is incorporating refrigerant and methane leaks. Methane's 100 year Global Warming Potential (GWP) is 25x of the 20 years value; time frame we are concerns with is 86x. California Air Resources Board (ARB) is using 20 year GWP of methane in their work. Only inventory work is using 100 year GWP.
    - Jay Madden: Should be incorporated. HP – you have a cooling system and you are replacing the gas furnace with the HP function of the cooling. The refrigerant leakage is the same.
    - Gary Fernstrom: It seems like leakage is related to when the unit is operating, so adding AC = higher operating hours, more hours of potential leakage.
    - Jay Madden: It is not more operating hours, but the system that used to be low pressure?
    - Gary Fernstrom: AC would come from renewable anyway – free electricity or equivalent to EE improvement.
    - Scott Blunk: Increase refrigerant leakage – it is real. Adding AC to homes that do not have it is also real, but most already have one so the change is minimal. The big saver is natural gas.
    - Jay Madden: Whole electric home NC, refrigerant or methane potential leakage is still there. You would need to get the whole gas infrastructure.
- Steven Long: Non-IOU fuel policy – custom project, for time and seasonal dependency, you have a situation where you cannot claim all the efficiency. Is that not part of this? (Ex. Gas WH -> HP + PV)
    - Jay Madden: It is covered in the technical guidance as if it were a regular EE measure without fuel sub.
- George Beeler: Adding AC adds to summer peak load.
    - Scott Blunk: The big saver is getting rid of the gas.
- James Hanna: What is the Fuel Sub Technical Guidance document. Can you share?
    - Abhijeet - *https://www.cpuc.ca.gov/General.aspx?id=6442463306*. Click the link at the bottom of the page for the document and spreadsheet.
- George Beeler: E3 found leaking refrigerants displace 30% of benefit of changing from NG so we need to add serious EE to reduce GHG.
- Akhilesh Endurthy (via chat): *https://pda.energydataweb.com/#!/?q=fuel%20substitution* search for Fuel Substitution.
- Jonathan Pera: Consider including guidance for incentive design for Fuel Sub measures... it is not clear how to apply CPUC incentive guidance to Fuel Sub measures.

- Jay Madden (via chat): *https://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442463564* for fuel substitution tech guidance. *https://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442463563* for fuel subst calculator.

EE Bundled Measures

Mudit Saxena: There are some measures that will not get considered on themselves - but they can offer immense energy and carbon savings - eg. HPs in locations where electricity cost is up to 6x or 7x more than gas cost. These are "stranded measures" that can be rescued by bundling.

Akhilesh Endurthy: For EUL and cost issue, NMEC guidelines could be a resource. Is deemed approach being considered? Bundling is being done to an extent on custom projects. It makes sense to create programs by bundling measures. Issues with bundling separating savings for individual measures, if we can consider a hybrid or deemed approach that could add a lot of value. – ex: QI/QM. NMEC can be a good resource, they have bundled measures.

- Abhijeet Pande: Agree, goal is to reduce barrier to entry and standardize assumption/methodology/verification.
- Martin Vu: Regardless of approach (ex. VFD and peak hour), challenge with the current cost effectiveness calculation makes it difficult to sell bundled EE + non-EE to the customer.
- Gary Fernstrom: You are talking about bundling with renewable, DR, storage not just EE, EE funding can only cover EE savings. There is no mechanism on the CET right now.
- Martin Vu: Could be anything but the challenge is the policy.
- Gary Fernstrom: That requires lobbying power.

Gary Fernstrom: Bundling confined to equipment-only measures? Opportunity to bundling QI with equipment installations. Ex: VSDs w/ pool pumps + behavior changes on correct operation to max savings of the pump. Ex. Lighting controls

- Abhijeet Pande: Building equipment and behavior/operation is a great opportunity.
- Steven Long: Recommends RCx. Consider hybrid approach, maybe if there were some policy changes that allowed you to have mix baselines, mixed costs etc..
- Jonathan Pera: Agreed. I see this mostly in the custom environment – you can put multiple measures in one M&V plan.

EE + DR Bundled Measures

Steven Long: Timing of implementation of measures a consideration if claims structure is separate? (Ex. DR comes after EE)

- Charles Ehrlich: TRC is used for DR, but inputs are different than for EE. Who are the customers for EE+DR? Customers who face change in tariff.

- Gary Fernstrom: In terms of delivery, much DR is aggregated and sold directly to the grid, it will be beneficial to customers if bundle delivered in uniform matter.
- Martin Vu: Water agencies shifting pumping off peak but might be constrained by that tariff. Some water agencies can sell back to grid when needed.
- Jonathan Pera: I have a contact for GridPoint if that is helpful for EE/DR bundle paper.

ACT: Follow up with Jonathan P. to get GridPoint contact to talk to (or include).

Armen Saiyan: Any thoughts about overlap in impacts and how to associate them respectively or does it matter? You often want to see the combined impact and there are some restrictions from the policy standpoint. Are there methodologies? Ex: smart thermostat "passive" vs DR shifting/shedding.

- Martin Vu: Yes, it matters. Cost effectiveness of EE and DR portion.
- Armen Saiyan: There is a method essentially to combine them together as a single product, their impact and cost effectiveness. It is the program offering that can be bundled together in that sense: project can have feature for both or separated – use case differentiation.

Policy Guidance for Load Profiles

Tom Eckhart: Are we changing any focus on load profiles that we have used or applied before?

- Armen Saiyan: Goal is to make sure that they are applied correctly and to develop what the proper applicability is or if they currently make sense, if manipulations are needed, when a proxy is appropriate when an "ideal" profile is not available. More focus on time dependencies increases attention.
- Tom Eckhart: RTF 5-year plan, also looking at updating load profiles

Marc Costa: What is the intersection of load profiles and prototypes?

- Armen Saiyan: Load profiles typically generated by prototypes, informed by field data.
- Marc Costa: How do we present operationalized uses?
- Akhilesh Endurthy: We have 8760 profiles, is this something that can be used? Integrate into C/E? Current DEER Load shapes are not a function of CZ, should consider?
- Armen Saiyan: Good point, how many permutations of these profiles do we need? It may depend on the measure. DEER load shapes are by utility, but there is a climate zone consideration.
- Gary Fernstrom: Regarding Tom's question, we haven't properly applied load shapes. As consequences of this effort, the importance is getting greater attention and outcome.
- Armen Saiyan: This may be an opportunity to align how load shapes and measure permutations are developed. Through measure consolidation process + bringing in climate zone dependency, analysis is required to see if the change is warranted.
- Bob Ramirez: Current scope DNV GL developing new shapes, primarily DEER – how many permutations, looking at viewer tool, transparency, etc.
- Ingrid Neumann: The ADM load shapes are based on forecast zone. We can map forecast zones into building climate zones.

- Armen Saiyan: Hence why some misalignment. Some opportunity to slice the data into geographic boundaries to look from, standpoint rather than forecast. The discussion is what are the resources that we can adopt or modify.
- Marc Costa: Durability is important, the load shape is durable and reusable asset. Viewer tool and transparency is important. Do we have authority to modify MASControl? It should be available to everyone who wants it.
- Armen Saiyan: Set up framework how updates will occur. Load shapes developed for different use cases and thus different methodologies. Some elements of DOE tools are public, but not entirely.

Abhijeet Pande: Not to add to the complexity but is the load profile subcommittee addressing interactive effects between measures. Thinking about how this work may affect the EE and EE+DR bundling.

- Armen Saiyan: We have not discussed that particular aspect, but it is certainly an important function for the bundling as you have mentioned. It would likely be difficult to do unless those bundles are well defined and stay constant throughout offerings, otherwise you will likely add an infinite amount of permutations to the load profile with the various combinations.

EE, Custom, & ET Measure Classification

Charles Ehrlich: What happens to measures at the end of the life cycle, reconstituting a “retired” measure (reclassifying a retired deemed measure into custom)

- Sepideh Shahinfard: Examples of ETs that enter custom.

Gary Fernstrom: What break in cost effectiveness can be given when they are in competition with other more cost effectives studies. Pressure on C/E makes it difficult for ET measures. Consider C/E criteria for ET measures that are in competition to existing measures. How would an ET project sponsor decide to fund and ET measure or not? ETP criteria.

- Sepideh Shahinfard: All this information should come from the ET study, it does not always come from there.
- Jay Madden: ET screens market/savings potential, more scrutiny now. There are ETs that are not cost effective (yet). Future C/E considerations. How do we dismiss something that is not cost-effective now but could be in the future?
- Ayad Al-Shaikh: White paper will help guide measures to most appropriate path.

Pierre Landry: Should there be a time dimension to measure classification. ET – pilot – EE/Custom – retired – revive? Is there enough variation in the field? Should a measure change classification at some point during its lifecycle in the portfolio if certain criteria are met?

- Charles Ehrlich: Classification of criteria at each stage of the measure life.
- Pierre Landry: We may want to talk about the whole dimension of conceptualization and ET inclusion in early program, pilot program, roll out. Also consider when it gets dropped off and put back to retire.
- Charles Ehrlich: Focus on determining the criteria.

Gary Fernstrom: SCE has encouraged ETs. Establish economic/cost effective “break” to encourage EE development.

- Abhijeet Pande: Look at EPIC classifications i.e. “underutilized” to address gap between ET and general pop programs.
- Pierre Landry: Program planning and evaluation should help to examine if/when measures are appropriately classified.

Jonathan Pera: Effort of calcs and M&V for custom relative to the savings should be a consideration for custom vs. deemed.