Agenda & Notes

California Technical Forum (Cal TF)

Meeting 49: Technical Forum (TF)

April 25, 2019

10:00 a.m. – 4:00 p.m.

Pacific Energy Center
851 Howard Street, San Francisco

Time	Agenda Item	Discussion Leader(s)
10:00 – 10:15	**Opening** • Updates	Annette Beitel, Cal TF Staff
10:15 – 11:00	**Overview of Plan for Modeling Charette** • Review proposed objectives & agenda • Review calibration matrix **ACT:** Cal TF feedback on agenda & calibration matrix	Annette Beitel & Doug Mahone, Cal TF Member
11:00 – 11:15	**Break**	
11:15 – 12:00	**Removing/Simplifying Measure Permutations** • Options for simplifying measure permutations **ACT:** Cal TF feedback on the issues & recommended solution	Tim Melloch, Cal TF Staff
12:00 – 12:30	**Lunch**	
12:30 – 1:45	**Measure Affirmation (Miscellaneous Measures)** • High-level overview of consolidated measures • Review notable issues **ACT**: Cal TF Affirmation of Consolidated Measures	Ayad Al-Shaikh, Cal TF Staff
1:45 – 2:15	**Measure Updates:** • Commercial Refrigeration: review notable issues • HVAC: submittal update	Ayad Al-Shaikh

	ACT: None (measures previously affirmed)	
2:15 – 2:30	**Break**	
2:30 – 3:00	**Overview of New TF Member RFQ** • Member expectations • RFQ schedule **ACT:** Cal TF Members let us know other possible Cal TF participants!	Jennifer Barnes, Cal TF Staff
3:00 – 3:50	**eTRM Update** **Survey Results** • Review main findings **Proposed Enhancements** • Overview of main enhancements • GHG • Linking eTRM to CET and CEDARS/reports on measure and program cost effectiveness **ACT:** Cal TF feedback on measure cost effectiveness reporting	Roger Baker & Jennifer Barnes
3:50 – 4:00	**Close** Recap agreements & action items	Annette Beitel

Meeting Materials

- Modeling Categorization
- Presentation: HVAC Measure Consolidation
- Presentation: New Member RFQ
- Presentation: Simplifying Measure Permutations
- Presentation: HVAC and Commercial Refrigeration Update
- HVAC Summary Spreadsheet
- Presentation: eTRM Phase 3 Enhancements

I. Attendees

	In-Person	*Via Telephone*
Cal TF Staff	Annette Beitel Jennifer Barnes Ayad Al-Shaikh Roger Baker Tim Melloch	
Cal TF Members	Steven Long, Lockheed Martin Spencer Lipp, Lockheed Martin Sepi Shahindard, Cadmus Armen Saiyan, LADWP George Beeler, AIM Chan Paek, So Cal Gas Doug Mahone, retired TRC Chris Rogers, CLEAResult Tom Eckhart, ECONS Ed Reynoso, SDG&E Gary Fernstrom, retired PG&E Mike Casey, Onsite Energy Lisa Gartland, Proctor Engineering Jay Madden, SCE	Larry Brackney, NREL Greg Barker, Energy Solutions Pierre Landry, retired SCE Larry Kotewa, Elevate Energy
Non-TF Attendees	Marcela Fox, PG&E Mananya Chansanchai, PG&E Jim Hanna, Energy Solutions Henry Liu, PG&E Bryan Boyce, Energy Solutions Lacey Tan, Frontier Energy	Breesa Collyer, PG&E Bing Tso, SBW Akhilesh Endurthy, Solaris Bob Ramirez, DNV GL David Springer, Frontier Energy Marc Costa, Energy Coalition Steve Kromer, SKEE

CALIFORNIA
TECHNICAL FORUM

I. Key Decisions and Action Items

Measure Affirmation
The Cal TF affirmed the subcommittee recommendations regarding stage 1 issues for the following measures:

- 2.20, Conveyor Broiler, Commercial
- 2.21, Refrigerated Chef Bases
- 2.19, Under Counter Type Dishwasher, Commercial
- 7.36, Gas Dryer Modulating Valve, Commercial
- 6.29, Flow Control Valve, Res & Non-Res
- 6.30, Dual Set Point Boiler Control for MF Space Heating

Introduction
Cal TF staff will add a presentation and discussion of approaches to improving cost effectiveness as a topic for a future TF meeting. Coordinate with Mananya on this.

Modeling Charrette
Cal TF staff will include calibration as a topic/discussion point at the modeling charrette.

Cal TF staff will add the following to the modeling matrix:

- The purpose of compliance models is to show compliance with the code. They are not meant predict/estimate real world energy use of the building. Recommend that code compliance models be changed to be more real world.
- Tools that are used for community-scale design and analysis can't be used to estimate incentives for CPUC programs. Recommend that the CPUC programs allow estimates from these tools for incentive calculation.

If there's other information you think we need or topics we should cover in the modeling charrette, email jennifer.barnes@futee.biz within the next week.

The following modeling charrette recommendations were made:

- Review the list of attendees so far with the intent of identifying gaps in the representation.
- Promote charrette to ASHRAE and with Doug Mahone to promote to CAEBEC. Jennifer Barnes to work with Jay Madden
- Add software vendors to the list of target attendees for the modeling charrette.
- Maybe host a concurrent session in LA.

Collapsing Permutations

Include a table of the options in the collapsing permutations white paper so they are easy view and compare.

Email Tim Melloch at timmelloch@t6wireless.com if you have questions or want to have further discussions.

Cal TF staff will draft a TPP on collapsing permutations for presentation at the July TF meeting. Will circulate in advance of the meeting.

Commercial Refrigeration and HVAC Updates

Later in the year, Cal TF staff will work to identify measures that have been sunset from the IOU portfolios but that 3Ps may want to work to revive and add these to the eTRM as “napping” or similar category.

Cal TF staff to add a list of measures that have been sunset from the IOU portfolios but that 3Ps may want to work to revive to the Cal TF website.

II. Meeting Notes

Introduction
Presenter: Annette Beitel

Today we'll cover:

- Modeling Charette – Register soon. The invitation will be circulated beyond the TF next week and we expect it to fill up. It will be in lieu of the May meeting.
- Collapsing Measure Permutations
- Final Consolidated Measures for Affirmation
- Measure Updates for HVAC and Commercial Refrigeration
- New Member RFQ
- eTRM Survey Training Highlights
- eTRM Enhancements

Next meeting will be in July where we will cover many of the Stage 2 items that we are pursuing in 2019.

September will be first meeting with the new TF members.

Gary Fernstrom: Are there going to be changes to the cost effectiveness (test) so that programs that are at risk of being dropped can be revived? Maybe use the societal test instead of the TRC?

Mananya Chansanchai: Something came out about doing a pilot for this. The IOUS are focused on cost effectiveness (c/e).

Gary Fernstrom: Many lighting measures have been eliminated and there remains opportunity with controls and higher efficacy. If the c/e is relaxed, there would be opportunities.

Annette Beitel: There are a number of approaches: like changing c/e test and adding GHG reductions. Doing more granular assessment of measures down to the CZ or customer type instead of SW. Also, accelerated replacement and using existing conditions. It's such a big issue and critical to making EE work.

ACT: Add a presentation and discussion of approaches to improving cost effectiveness as a topic for a future TF meeting. Coordinate with Mananya on this.

Spencer Lipp: Do a root cause analysis to determine why programs that have always been good are now struggling.

Mananya Chansanchai: It's not just PG&E who wants early replacement for lighting but SCE as well. In traditional model, it's more challenging to look at it from a customer deemed standpoint. It's an opportunity to refresh portfolio. Putting more emphasis on financing program which is more c/e. Also, NMEC. PG&E is excited about new program ideas.

Doug Mahone: In addition, to change to societal cost but also program administrator cost.

Annette Beitel: A recent draft potential study says there's only a few % of savings left. That suggests a need for a more creative look at how we value EE.

Gary Fernstrom: There are program design opportunities, but they are contingent on more flexibility on c/e.

Modeling Charrette
Presenter: Doug Mahone

Tom Eckhart: On the Modeling Charrette, I gave some comments based on an RFT project. The problems we had at the RFT is how do you calibrate the modeling process? I'll hold my questions to the end but I hope the process will address this.

Annette Beitel: The presentations today won't cover that but we want feedback on what topics to cover at the Charette. That is an important topic.

ACT: Include calibration as a topic/discussion point at the modeling charrette.

ACT: If there's other information you think we need or topics we should cover in the modeling charrette, email jennifer.barnes@futee.biz in advance of the charrette.

Bryan Boyce: Will there be decision-makers from the CEC and CPUC?

Annette Beitel: Martha Brooks from the CEC and Bob Ramirez and Bing Tso from the CPUC EAR consulting teams will be there. This isn't about decision making though. We strive not to put regulators on the spot. We want them to be there to learn and the group to come up with recommendations.

Steve Kromer: Thank you for taking this on. Getting interest from the DOE who hired me to look at how modeling is done in commercial programs across the country. If you are interested in this at all, you probably have strong opinions. People need to come with the right attitude to learn and share.

Gary Fernstrom: Many factors are standardized for determining compliance, is there a movement to try to adjust these to be more real world?

Doug Mahone: That's not the goal of T-24. It's to meet code not show that your building is real world. Doesn't predict what energy bill is going to be.

Gary Fernstrom: Is there a movement to change this? So, it's more consistent with the real world or are we happy with that we've got?

Doug Mahone: I think the code compliance folks are happy.
ACT: Add to the modeling matrix: the purpose of compliance models is to show compliance with the code. They are not meant predict/estimate real world energy use of the building. Recommend that code compliance models be changed to be more real world.

Armen Saiyan: The tools may have other features so you can run to make it more realistic, but it's not used for this.

ACT: Jennifer Barnes to work with Jay Madden to promote charrette to ASHRAE and with Doug Mahone to promote to CAEBEC. Review the list of attendees so far with the intent of identifying gaps in the representation. Maybe host a concurrent session in LA.

Larry Brackney: Doug's list is good but omits use cases for community-scale analysis/design/planning and operationalization of models for dashboarding, FDD, and control. With respect to design modeling, architects still use a simplified model for MAC analysis and another for mechanical sizing.

Steve Kromer: Didn't see specifically if you had the software vendors notified.

ACT: Will add software vendors to the list of target attendees for the modeling charrette.

Marc Costa: Building on Larry's comment about large-scale analysis – some of the tools that enable large scale analysis and bridging the gap to the CPUC tools. You can't use these tools to estimate incentives.

ACT: Add to comments/matrix: tools that are used for community-scale design and analysis can't be used to estimate incentives for CPUC programs. Recommend that the CPUC programs allow estimates from these tools for incentive calculation.

Spencer Lipp: How different are the custom measures from the row "estimate EE savings before and after".

ACT: If you have comments on the content or structure of the matrix or the agenda, please send comments to jennifer.barnes@futee.biz within a week.

Collapsing Measure Permutations
Presenter: Tim Melloch

Tom Eckhart: This may be more to my earlier point, never thought about gaming, but in the NW we are dealing with…if you don't pick a set of base numbers that you can calibrate to, you end up with a wide range of permutations with no basis. Then you find that you don't have enough benchmark data to keep the values in the database. Then you leave it up to the utility to say how you came up with the savings. I was wondering how you were going to deal with it down here.

Akhilesh Endurthy: The example "thermostat options" is a sensitive parameter. Is the proposal to do granular analysis and consolidate if now significant variation?

Doug Mahone: To a certain extent, coming up with a % number misses the point. Any estimate is a point estimate but in reality, there is range. It's a point estimate with +/-. Instead of coming up with what difference is significant enough, we need to be looking at the range and which ones we can collapse because they have similar ranges. It becomes a statistical problem instead of an arithmetic problem.

Henry Liu: For HVAC measures, when NC is used, the vintage type is a little different, the envelope is tighter so there are differences. So, you can't say that about all measures.

Mananya Chansanchai: The standard practice baseline is always the same but not for NC.

Lisa Gartland: Any that you eliminate you should document somewhere.

Tim Melloch: Will memorialize within the measure.

Bing Tso: The conversation is consistent with our discussion that we have to document the rational and the data behind it. The discussion was specific to the eTRM – is this a post processing function or a design tool and from that you decide which permutations we need. Instead you have 200 permutations and decide how to winnow it down.

Armen Saiyan: This is an all or nothing choice, right? If only two are the same but one is different, you'd have to have all of them included.

ACT: Include a table of the options in the collapsing permutations white paper so they are easy view and compare.

Doug Mahone: The reasons we got where we are someone said that computers can generate as many permutations as we want.

Henry Liu: Some of these lead to eligibility and calculations. For instance, if there's no MAT, there's not enough information to understand if they have to deal with early retirement requirements. It might make sense to have a report that anyone can look at but that we are able to generate something if someone wants to look at it some more.

Tom Eckhart: 10% is a pretty tight band. What's the basis for that?

Annette Beitel: This number came from the RTF operations manual, but other TRMs are using this number. It's a rule of thumb. We may not have the data to support something more than just a rule of thumb. But it's a practice.

Steven Long: A fixed criteria is relative to the savings value. You might be falsely combining.

Annette Beitel: We need to capture our recommendations around these things.

Tom Eckhart: What I see in the RTF operations manual, there's not much difference, but I thought there was a wider range for some measures.

Armen Saiyan: If you have to weight it against the impact in the portfolio, it could be small at the measure level, but at the portfolio it's a huge number.

Steven Long: When I've looked at CZ 1 and 2 there were big differences, but all others will be very tight.

Greg Barker: I wouldn't want permutation simplification to be a motivating factor for workpaper authors to narrowly define delivery type or measure application type, preventing that measure from being adapted for future use in another MAT/delivery type.

Pierre Landry: This all comes back to the question of how big a difference is worth a separate permutation. That 10 is a policy issue right now. Should it not be?

Bing Tso: Unfortunately, the percentage range for permutation collapse should tie in with the TRC. If a measure has a TRC ratio of 1.1, 10% matters a lot. If the TRC is 2.2, then permutations could vary by much more than 10% with little consequence.

Spencer Lipp: How you weight may help minimize the error.

Lacey Tan: If you are saying that's applicable to specific CZs in CEDARS then you can do that.

Breesa Collyer: It defaults to the most conservative, but it's not a policy. The reason it's all or nothing is that if you have CZ 1 and 2 specified, and all the rest are the same number then the only other option is "all". It's a data structure look up issue.

Armen Saiyan: Do a sensitivity analysis up front to see what drives the savings.

Ayad Al-Shaikh: Some variables matter a lot more than others.

Armen Saiyan: This sounds like a judgement call made up front. Accompanied with documentation. A lot determined by how the program is designed. This would have to look at it with a broader point of view.

Chris Rogers: We've done some tornado diagrams otherwise you have 10,000 permutations for one measure. You have to make a decision on what's the typical set points, etc. and see which ones you should dive into and which you shouldn't.

Gary Fernstrom: We have a gazillion permutations. We have relatively few programs. So, it appears that we're spending a lot of effort trying to deal with the complexity of generalized permutations when we might just evaluate every program on an individual basis.

Henry Liu: The disconnect is that whenever we generate permutations and submit to ED, that's what we expect. If the eTRM wants to have a smaller set, that's fine but as long as we have the data somewhere to submit a set to send to the ED.

Annette Beitel: We're not proposing to do this for convenience it's to remove false precision.

Tim Melloch: Concerned with Gary's comment since that sounds like gaming. You've used collapsing to get an average but then you grabbed a higher value.

Gary Fernstrom: But it's also targeting.

Spencer Lipp: If that geographic area is your area, you shouldn't be forced to use the average. It's targeting the appropriate geography to reach an area.

Annette Beitel: We're not proposing to collapse values that are far apart.

Mike Casey: If you are targeting a high value area, you can remove that from the average.

Lacey Tan: If you are going to look at TRC, you should look at 1.25 not 1.0 since that's what's required. That's what goals study looked at.

Doug Mahone: The eTRM will be able to recalculate a value. Does that mean that the eTRM will have calculation capability?

Annette Beitel: For some users who have access.

Spencer Lipp: If the CET can't handle it, then the CET should change.

Next Steps:

- Cal TF staff will draft a TPP on collapsing permutations for presentation at the July TF meeting. Will circulate in advance of the meeting.
- Email Tim Melloch at timmelloch@t6wireless.com if you have questions or want to have further discussions.

Measure Affirmation
Presenter: Ayad Al-Shaikh

2.20 Conveyor Boiler:

2.21 Refrigerated Chef Bases:

Doug Mahone: Savings based on square footage?

Ayad Al-Shaikh: Based on cubic feet. The width is the sensitive variable.

Armen Saiyan: Is there less savings as the units get bigger?

Ayad Al-Shaikh: They went back to one vendor who had different size cabinets and looked at energy data. This came from looking at a manufacturer's data.

Doug Mahone: But the % is applied to energy per cubic foot.

2.19 Under Counter Type Dishwasher, Commercial:

Gary Fernstrom: It's going the other direction from the rest of the measure consolidation effort. Let's unbundle it and make it more complicated.

Jay Madden: It's for the future.

7.36 Gas Dryer Modulating Valve, Commercial:

6.29 Flow Control Valve:

Armen Saiyan: Are savings based on them working together?

Ayad Al-Shaikh: No. Same base and measure case. By putting them in the same measure you ensure the methodology is the same.

6.30 Dual set Point Boiler Control for space Heating, Multifamily:

<u>Measure Affirmation</u>
Ayad Al-Shaikh: Does the Cal TF affirm the subcommittee recommendations regarding stage 1 issues for the following measures?

- 2.20, Conveyor Broiler, Commercial
- 2.21, Refrigerated Chef Bases
- 2.19, Under Counter Type Dishwasher, Commercial
- 7.36, Gas Dryer Modulating Valve, Commercial
- 6.29, Flow Control Valve, Res & Non-Res

- 6.30, Dual Set Point Boiler Control for MF Space Heating

Everyone in the room and on the phone approves the affirmation.

Commercial Refrigeration and HVAC Updates
Presenter: Ayad Al-Shaikh

Gary Fernstrom: One of the subtleties is if you are doing a system retrofit, probably the replacement products are consistent with code. But if you get an OEM replacement part, then it's probably the old part.

Ayad Al-Shaikh: Need to find out what those sets of questions are so we can deal with it. It's more than just these measures.

Henry Liu: Is there a simple ISP study we can conduct. What would customer have chosen? Have manufacturers really changed production?

Spencer Lipp: Can't confuse sophisticated customer with the mom and pop stores.

Gary Fernstrom: Trying to make a case for retaining this program. If could focus it on "one off" basis would probably still be really cost effective.

Jay Madden: WP still there, 98% done, wouldn't be hard to finish and put in eTRM and bring back to life, even if currently list as retired.

Spencer Lipp: You don't know what implementers may come up with to use measures.
Chris: We may want to revisit these retired measures in the future.

Annette Beitel: Is the savings low because the unit savings is low or is it because there isn't market uptake and the portfolio savings is low.

Armen Saiyan: Along with technical potential, some other measure may have direct competition with it.

Jim Hanna: Definitely think there is savings. It's how the WP was developed and the performance curves. Issues are changed from what was in the disposition so the VRF potential and changes in the market there's going to be a different story. Is there a path forward? Yes.

Annette Beitel: So even if they are retired, you think that they should be available for 3Ps to revive?

Jim Hanna: Yes

Annette Beitel: So, we should provide the clear documentation and the reasons for sunsetting in a reference library somewhere. In the eTRM or somewhere else?

Jim Hanna: In the eTRM.

ACT: Later in the year, Cal TF staff will work to identify measures that have been sunset from the IOU portfolios but that 3Ps may want to work to revive and add these to the eTRM as “napping”.

Steven Long: Would it be useful to put a list on the Cal TF website as “on hold” and a brief description of the rational.

ACT: Cal TF staff to add a list of measures that have been sunset from the IOU portfolios but that 3Ps may want to work to revive to the Cal TF website.

Gary Fernstrom: Do you have the map of the measures that have come back from the EAR team?

Ayad Al-Shaikh: Some of the first ones have come out.

New Member RFQ
Presenter: Jennifer Barnes

Presented proposed details for Cal TF Member RFQ including types of experience, responsibilities, terms of service. Outlined member benefits of participating. Reviewed eligibility criteria, including education, experience and skills (including engineers, data scientists, EM&V, statistics, codes & standards, energy modeling).

Gary Fernstrom: Brought up including marketing and successful program design experience as an important skillset to seek from new members.

Steven Long: Suggested combining some of the categories like data science, statistics, behavioral, etc.

Doug Mahone: Technical aspects of energy efficiency rather than specifying an engineer. Rather than computer modeling, building energy modeling from simple calc's to hourly simulations.

Jennifer Barnes: Presented TF Member Commitment expectations, including expectations for in-person attendance, advance review of meeting materials, and specific peer review requirements for workpapers, TPPs or equivalent and participation on at least one subcommittee.

Tom Eckhart: RTF went back to monthly meetings after two years of bi-monthly meetings due to a lack of continuity.

Spencer Lipp: We talked about WP flow process earlier this year. If implementers doing more WPs or reviving dormant ones, may be too early to decide if should go to bi-monthly meetings.

Doug Mahone: Thinks first slide is missing what we've done and what we'll plan to do going forward.

Jennifer presented RFQ schedule, release 5/16, RFQ promotion details: Cal TF website, presentations to CEDMC, NAESCO.

eTRM Training Survey Highlights
Presenter: Jennifer Barnes

Bing Tso: How did these results compare with the post survey results from the SBW led training earlier this year?

Jennifer Barnes: The SBW led trainings were for IOU measure developers only; unfortunately, we didn't survey them after the training.

eTRM Enhancements
Presenter: Roger Baker

Spencer Lipp: How do I put in a measure into eTRM?

Steven Long: Most programs have a mix of deemed and custom measures.

Lacey Tan: The eTRM will be useful for measure level work but not for program level work.

Doug Mahone: Primarily a way to extract from eTRM and put it in the CET then add your other elements. Can you then just run the CET?

Lacey Tan: Even just an output that you can put into the CET would be great. Would be great to have a measure level PAC value on demand. Or if you are going to set it up to link with it that would be more useful. Otherwise your duplicating the purpose of the CET. Would be nice to look at the measure level PAC. A CET ready export.

Armen Saiyan: For any measure, you'd need those c/e measures.

Spencer Lipp: Will give a false sense of the TRC because of different delivery and admin costs.

Armen Saiyan: The issue of bringing all of the CEC outputs.

Spencer Lipp: Give the implementers a tool to work with rather than to try to solve the problem for them. Most implementers have their tools that they work with.

Closing
Presenter: Annette Beitel

No meetings in May or June.
July will focus on stage 2 issues.