California Technical Forum (Cal TF)
Technical Forum (TF) Meeting #17
February 25th, 2016
Pacific Energy Center
San Francisco

I. Participants

Annette Beitel, Cal TF Facilitator
Alejandra Mejia, Cal TF Staff

Tom Eckhart, TF Member
Larry Kotewa, TF Member
Alina Zohrabian, TF Member
Grant Brohard, TF Member
Spencer Lipp, TF Member
John Proctor, TF Member
Gary Fernstrom, TF Member
Mike Casey, TF Member
Ron Ishii, TF Member
George Beeler, TF Member
Owen Howlet, TF Member
Ryan Hoest, TF Member
Doug Mahone, TF Member
David Springer, TF Member
Mark Modera, TF Member
Ahmad Ganji, TF Member
Martin Vu, TF Member
Sherry Hu, TF Member
Armen Saiyan, TF Member
Pierre Landry, TF Member
Ed Reynoso, TF Member

Greg Sullivan, Presenter, UCONS
Jeff Gleason, Presenter, Nest Labs
Michael Blasnik, Presenter, Nest Labs

Pete Ford, San Diego Gas & Electric (SDG&E)
Chan Paek, Souther California Gas Company (SCG)
Henry Lu, Pacific Gas & Electric (PG&E)
Dave Schallenberger, Synergy Companies

Mark Hardwick, TrickleStar
Domenico Gelonese, Embertec
Scott Wilson, Bits Limited
Aaron Berndt, Nest Labs

On the Phone
Yeshpal Gupta, TF Member
Srinivas Katipamula, TF Member
Christopher Rogers, TF Member
Bryan Warren, TF Member
Bruce Harley, TF Member
Bing Tso, TF Member
Andy Brooks, TF Member
Steven Long, TF Member

Joe Prijyanonda, Applied Energy Group
Kate George, PG&E
Roger Baker, ComEd

II. Key Decisions and Action Items

Closed-Door Session

- ACT: Investigate cost of QA/QC firm.
- ACT: Cal TF staff to write up consensus proposal.
    - o Including requirement to replicate a test set of values. Standard to be applied on all players/models/data sets we are expected to use.
    - o Including process map for added dedicated peer review function.
- ACT: Convene one subcommittee meeting to review and affirm proposal in preparation of March TF meeting.

Preview of 2016 Subcommittees and Measure Review Plan

- ACT: Alejandra to send out request for four short Q1 subcommittees:
    - o eTRM Threshold Process Issues
    - o eTRM Threshold Technical Issues
    - o Capstone Memo
    - o Measure Selection

Smart Thermostats Combination Data Approach

- ACT: **Measure approved to continue to full workpaper development.**

- o Workpaper developers to investigate various factors contributing to extended or decreased EUL.
- o Workpaper to only offer downstream incentives

<u>Ductless Mini-Splits Measure Abstract</u>

- ACT: **Measure approved for full workpaper development utilizing *existing* data.** Workpaper to address concerns with:
  - o Level of service as affected by change in temperature in back zones.
  - o Fuel switching.
  - o Potential for added demand.

III. Closed-Door Session

This closed-door session was conducted to allow the Technical Forum full freedom to be self-critical in response to an error identified in one of the WPs reviewed by the group. Detailed minutes were not taken in accordance with this goal. However, key ideas, suggestion, group consensus, and all action items are highlighted here:

Discussion leading to consensus acceptance of logical error on disposition path; various views were expressed, including questions about the lack of existing data for different path weighting. Question and discussion on true savings reduction from disposition comments.

Mistakes will happen. What we need is an interaction that leads to true exchange of ideas. We already have very robust discussions and questioning of the WP presenters.

The problem is that no standardized review criteria exist—we still haven't been able to nail down the criteria the EAR team uses so we are using the same set.

None of the recommended Roles/Responsibilities for WP developers could have avoided the Clothes Washer Recycling mistake—they were all satisfied in that case.
- A good QA/QC check is to try to replicate a test set of values. This standard needs to be applied on all players/models/data sets we are expected to use.

"Tech Review" under Cal TF staff should be de-emphasized further. "Form" responsibility is much more important to enable TF to do the "Tech Review."

- Continuing to standardize the form of values and statistics presented to the TF is very important to ensuring effective TF review.

The formal QA/QC function needs to be placed somewhere. Otherwise we are still shunting some of the most burdensome, and still very important, functions to WP developers and EAR team. This goes back to needing all parties at the table, but they need to be there with a true collaborative spirit.

Comments on detailed peer review suggestion:

The distribution of effort per TF member will always depend somewhat on the subject matter of the materials that come in. However, a couple of WPs a year seems very doable and of vital importance. Very strong consensus for making assigned, detailed peer review a requirement for TF membership/WP affirmation.
- A small group of people per WP, not just one individual.
- Detailed peer reviewers should be dedicated "error finders," designated opponents.
- Official peer review ownership will enforce responsibility.
- Need to define when the peer review function would come in.

Discussion of value of knowing the details of Commission and ED/EAR guidance. Cal TF staff has organized high-level Commission guidance for measure development. PAC has signaled that DEER is not our truth standard—best available data and scientifically defensible values are our goal.

Concern about even this level of effort satisfying CPUC Staff. Should still consider hiring QA/QC firm—that may not really be in line with the value TF was formed to provide in part of the court of public opinion. We do not have the statutory obligation for QA/QC that ED has.

Minimum qualifications for developers and supervisors would be overreaching.

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IV. Preview of 2016 Subcommittees and Measure Review Plan

Annette Beitel, Cal TF Facilitator—

<u>PowerPoint Presentation</u>

Measure Review

Steven Long and Spencer Lipp—On the POU TRM list, strip curtains and whole home fans used to be offered a lot in IOU territories. They may have been taken out of DEER, but the measure characterizations still exist.

Annette Beitel—In March the group is going to have to make some decisions about how to allow manufacturers to present ideas to the TF. Are there any initial thoughts on this question?

Ahmad Ganji—I think it is very important to know that the measures we're spending our time reviewing will be enthusiastically implemented by the utilities. That is why every measure will need a PA sponsor.

Annette—Yes, we have had this discussion before and it seems like there is very strong consensus for making that a requirement.

Spencer Lipp—Grundfos did a very good job of presenting the whole range of savings and parameters. I think clearly there is value in manufacturers presenting to us as long as they can be independent and recommend measures that work for all.

John Proctor—I do not want to stifle innovation just because of whom it may be coming from.

Doug Mahone— It seems like it's time to start using the stage gate process that we created at the very beginning.

Annette Beitel—Yes. Is the TF comfortable with using a small group of members to go through stage gate process for measure selection?

Group—Yes.

Subcommittees

- ACT: Alejandra to send out request for four short Q1 subcommittees:
    o eTRM Threshold Process Issues
    o eTRM Threshold Technical Issues

- o Capstone Memo
- o Measure Selection

V. Subcommittee Report Out on Measure Complexity

Annette Beitel, Cal TF Facilitator—

PowerPoint Presentation

Ron Ishii—What evidence do we have that it is cheaper to model measures in EnergyPlus?

Annette Beitel—We have an analysis from NREL comparing what it would cost for them to model our existing measures in EnergyPlus, against current costs in California.

Ron Ishii—I think it's worth really investigating those claims, because EnergyPlus *is* a very good model, but most modelers in California are not as proficient with it than they are with DOE2.

Martin Vu—It seems like we'll need different tiers of necessary complexity for measures depending on overall portfolio impact.

Ron Ishii—I definitely agree that modeling should not always be the answer. We need to be striving for the right balance between capturing as much of the nuance while bearing the cost of that complexity in mind.

Mark Modera—I think the devil will be in the details. You're going to get arguments for every measure or product that that case *needs* the complexity. We'll need to be ready for that.

Armen Saiyan—And I think that's where the relation to portfolio impact is so important.

Ahmad Ganji—We also need to be relying a lot more that we currently do on sensitivity analyses. Those will help us show when complexity adds or does not add value.

VII. Update on Advanced Power Strips Workpaper

Martin Vu, RMS Energy Consulting—

John Proctor—First, I'm not convinced that the difference in savings between the two products is not significant. Second, I don't understand what cost considerations are preventing the utilities from pursuing two different values.

Martin Vu—The costs considerations are administrative and program management-related.

John Proctor—I don't support the idea of sacrificing/averaging the savings value for administrative expedience. Why would we not strive to incent the products that maximize savings?

Gary Fernstrom—If you do plan on going with a single value, I would urge you to use weighted averages based on market shares.

Spencer Lipp—I think it is completely the utility's prerogative to choose to continue with or without the Cal TF process. Maybe we need some more information on the administrative costs as well, so we can more effectively judge if one measure is one or two. Because it did look like two measures to us, but clearly we didn't have all the information.

Annette Beitel—The problem with that is that we've already received reminders from the PAC that technical rigor, no administrative expediency, should be our guiding goal.

Spencer Lipp—But isn't that also the best technical answer that's cost effective? Because we do not recommend extreme precision on other measures when the cost of that extra complexity outweighs the value.

Owen Howlett—I'm concerned that averaging the savings estimates creates a disincentive to invest in increasing the efficiency of existing products. Why would a company make that investment when they won't be compensated for yielding higher savings?

VII. Smart Thermostat Combination Data Approach

Jeff Gleason and Michael Blasnick, Nest Labs—

PowerPoint Presentation

Annette Beitel—Have you considered using programmable thermostats as the base case?

Jeff Gleason—The question with programmable thermostats is always how well programmed they actually are, and whether the Title 24 energy use estimates are accurate at all.

Aaron Berndt—Another reason we want to go with existing conditions is to not mix data qualities. We're getting actual field survey data to estimate all possible base cases.

Spencer Lipp—You should also consider cases where a new thermostat is installed as part of an HVAC overhaul. That should be considered as part of the replace on burn out baselines.

Jeff Gleason—We can definitely capture all of those cases—including the new instances were the device is given as a giftwith the survey.

Armen Saiyan—So you are considering separating the baselines?

Jeff Gleason—Yes.

Annette Beitel—So, what I'm hearing the group say is that you want to use Title 24 for some cases and existing conditions in others.

Jeff Gleason—Yes. I would only say that we probably don't want to ask individual customers that question in other to get the rebate, just use a survey data-weighted average of baselines in single workpaper.

Grant Brohard—Could you use your survey to tease out rates of time of use participation?

Jeff Gleason—I would say that will be a question to answer in 2019, but we can definitely start down that road now.

Bruce Harley—Let's make sure we capture thermostats as part of new HVAC units in the ROB scenario.

Spencer Lipp—You will also need to gather enough data to disprove the currently outdated EUL estimate.

Doug Mahone—Would this pull savings away from the main HVAC units?

Jeff Gleason—It may pull some savings away from the QI and QM programs, but I understand there is a very small to negligible volume of downstream AC equipment rebates being claimed right now.

Mark Modera—So, what is your plan for incorporating Nest-specific data into a WP that includes other manufacturers?

Jeff Gleason—We think some of our data will be useful for estimating general parameters that will apply to all devices, and that for the other data needs the remaining manufacturers will also be willing to contribute with their own efforts.

Gary Fernstrom—If the energy savings come from reduced operating hours, then is there some sacrifice in comfort?

Jeff Gleason—We don't think so, because of several of out features: The auto-away trigger and occupancy sensors.

Ron Ishii—What are the chances that the mix of data will lead to an average that essentially covers all, but does not reward highest performing devices?

Aaron Berndt—The IOU RCTs will fill in the device-specific data.

Annette Beitel—How does the incentive that led to the 80% lift compare to the incentive you are hoping for in California?

Jeff Gleason—That was a $100 incentive, which we think is a reasonable value in California as well.

Pete Ford—On your EUL value, we've been told to use 8 or 7 years, since the devices use more sensitive sensors.

Jeff Gleason—Our own internal data leads us to estimate 11 years because of the battery life.

Chan Paek—Is your set point data from Nest?

Michael Blasnik—Yes, it is from Nest devices in California, fed through every single change in set point.

Gary Fernstrom—Those set points are cooler than I expected. Do you think there may be some selection bias towards the environmental-focused population?

Michael Blasnik—Maybe a little, but I would say the appeal is more on the tech and "cool factor" of having a fancy device that speaks to your phone.

Aaron Berndt—But in general, having a smart thermostat does increase awareness of temperature. So, while that bias may not have been there before purchase, the device does have a psychological effect towards conservation.

Annette Beitel—Does the EPA have an eligible measure definition?

Michael Blasnik—Yes, there is a draft definition, but they still want to request empirical data in addition to just meeting the definition.

Tom Eckhart—We've been struggling a lot at the RTF about the interaction between the thermostat device and the existing HVAC equipment. I think your empirical data is a fantastic answer to those questions.

Mark Modera—Are you measuring outdoor temperatures too?

Michael Blasnik—This is zip code-level weather data queried by the thermostats.

Annette Beitel—Do you really think people can answer questions about their previous set points and schedules?

Michael Blasnick—They certainly do answer them. There may be some bias there, but we can likely regress to the mean/truth.

Grant Brohard—I would consider adding a question about the age of the existing HVAC equipment.

Doug Mahone—You may want to reduce your EUL based on the increased rate of equipment improvement. These are desirable devices like smart phones that are more likely to be upgraded for the next cool version.

Mark Modera—Sticking to downstream incentives

Annette Beitel—So, given that Nest does have strong interest from all IOUs, does the group support moving forward to full workpaper development using this survey approach to fill in data blanks in the climates zones that are still waiting for RCT results?

Group—Yes.

- ACT: **Measure approved to continue to full workpaper development.**
  - Workpaper developers to investigate various factors contributing to extended or decreased EUL.
  - Workpaper to only offer downstream incentives.

VIII. Ductless Mini-Splits Measure Abstract

Tom Eckhart and Greg Sullivan, UCONS—

PowerPoint Presentation

Owen Howlett—For context, who is funding this work?

Tom Eckhart—Mitsubishi provided the equipment for the demonstration project, we at UCONS provided the labor and evaluation resources. It would likely be inappropriate for us to continue funding any expansion of the pilot.

Steven Long—When you discussed fuel switching with various people at the Commission, did the notion of "level of service" come up?

Tom Eckhart—No, that phrase was no discussed.

Steven Long—I think that will still be a critical roadblock to be addressed.

Mike Casey—Do you block any of the duct systems?

Greg Sullivan—No, we do not make any structural changes to the existing ducts. We educate the customers as much as possible on how to best operate the ductless system, but that is as far as we go.

Mark Modera—Do you measure the duct leakage in the existing homes?

Greg Sullivan—We have not yet, but that would help us calibrate our baseline estimate.

John Proctor—What is the max wattage draw of the equipment?

Mitsubishi—That particular unit maxed out at 1,500 Watts.

Mark Modera—Do you have the temperature for the back rooms?

Greg Sullivan—Yes, and they are certainly warmer than the main living spaces.

Steven Long—Demand savings are increasingly driving our program offerings, so I think you'd need some sort of lock out mechanism in the existing system to prevent negative demand savings during peak periods.

Greg Sullivan—Does the "level of service" issue come up for DR program design?

Spencer Lipp—Not in my experience.

Gary Fernstrom—The level of service in an AC cycling program is heavily dependent on the size of the existing equipment. If what you're cycling is very adequate or over-sized, you'll never notice its off.

John Proctor—As a suggestion, it would be very helpful to plot average outdoor temperature vs. kilowatt-hours.

You could also try flip-flopping to get baseline data.

Greg Sullivan—We considered that; however, that is very hard to do correctly with occupants.

Mark Modera—Or you could separate out the thermal zones and measure the delta T in the hot rooms.

John Proctor—That's very hard on the variable speed compressor.

Owen Howlett—Did you close off the vents from the existing system in the room being serviced by the ductless system? It seems much cleaner to put in two separate ductless systems.

Greg Sullivan—That is a matter of cost effectiveness.

Owen Howlett—It could still make sense to just seal off the main living zone vents so you end up having two completely distinct zones.

John Proctor—But then you are sacrificing the efficiency of the existing equipment.

Owen Howlett—Is there any reason to believe that there was some comfort sacrificed in the demonstration project?

Greg Sullivan—Not at all. We never once told the occupants not to turn on their previous duct system.

Spencer Lipp—To me, the idea that the customer retains control over their equipment and thus comfort addresses the "level of service" concern.

David Springer—I wonder if installation would trigger code on the existing system and also, if there are any filtration concern.

Mark Modera—Is the existing data enough for a reasonably expected value?

Annette Beitel—Or do we need further data points?

Steven Long—I think we also need to investigate if the Ex Ante Review team would even buy off on the concept of the measure. I think they'll still have concerns with the technology providing the same level of service, fuel switching, and added demand.

Ron Ishii—Again, this point to why we need meaningful participation from Energy Division on this panel. Their thinking needs to be able to evolve as new information is presented, not just react to it in isolation.

John Proctor—I think we have enough data sets between NW program data and the Sacramento and Stockton to draft and interim measure to be offered by the the PAs. That in turn will help us collect even more data.

Group—Agreement.

- ACT: **Measure approved for full workpaper development utilizing *existing* data.** Workpaper to address concerns with:
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