California Technical Forum (Cal TF)
Technical Forum (TF) Meeting #15
December 3rd, 2016
Pacific Energy Center

I. Participants

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

Bryan Warren, TF Member
Armen Saiyan, TF Member
Pierre Landry, TF Member
Larry Kotewa, TF Member
Bruce Harley, TF Member
Christopher Rogers, TF Member
John Proctor, TF Member
Gary Fernstrom, TF Member
Spencer Lipp, TF Member
George Beeler, TF Member
Doug Mahone, TF Member
Owen Howlett, TF Member
Andy Brooks, TF Member
Mike Casey, TF Member
Steven Long, TF Member
Mary Matteson Bryan, TF Member
Martin Vu, TF Member
Tom Eckhart, TF Member
Ed Reynoso, TF Member
Brandon Tinianov, TF Member

Katie Wu, California Public Utilities Commission Energy Division Staff
Dina Mackin, California Public Utilities Commission Energy Division Staff
Pete Skala, California Public Utilities Commission Energy Division Staff
Jeff Hirsch, Ex Ante Consultant to CPUC Energy Division Staff

California Assemblymember Bill Quirk
Anthony Hernandez, Southern California Edison (SCE)
Mike Myser, Energy Platforms
Thad Carlson, Trickle Star
Lara Ettenson, Natural Resources Defense Council (NRDC)

Domenico Gelonese, Embertech
Pete Ford, San Diego Gas & Electric (SDG&E)
Gay Powell, Pacific Gas & Electric (PG&E)
Dave Schallenberg, Energy Companies
Jun Furuta, PG&E
Mangesh Basakar, PG&E

On the Phone
Ron Ishii, TF Member
Srinivas Katipamula, TF Member
Yeshpal Gupta, TF Member

Amir Roth, Department of Energy (DOE)
Chan Paek, Southern California Gas Company (SCG)
Andrew Parker, National Renewable Energy Laboratory (NREL)
Roger Baker, Commonwealth Edison (ComEd)
Joe Prijyanonda, Applied Energy Group
Kevin Madison, Ex Ante Consultant to CPUC Energy Division Staff

II. Key Decisions and Action Items

Final Deliverable: POU TRM Review and DEER Documentation Subcommittee

- ACT: Add Whole House Fans with real data to potential 2016 measure list.
- ACT: Cal TF staff to follow up with Armen Saiyan about LED MR 16 assumptions in other TRMs.

Electronic Technical Reference Manual Proposal

- ACT: Cal TF staff to review use of EnergyPlus for residential modeling.
- ACT: **TF approval of Technical Position Paper No. 2 and Electronic Technical Reference Manual proposal.**

Savings to Code

- ACT: **Cal TF affirmation of Technical Position Paper No. 1.**

III. Final Deliverable: POU TRM Review and DEER Documentation Subcommittee

Tim Melloch, Cal TF Staff—

PowerPoint Presentation

Pierre Landry—It's helpful to point out that this is a database that has grown organically for decades. It clearly needed much more planning and design work several years ago. I think what we've been talking about for the last few months is what we need to do now that we have realized the structural problems.

John Proctor—But its not just the structure that is the problem. The content is also very difficult to understand. Items change in what seems like a very haphazard fashion and there is very little in the form of narrative explanation for those changes.

Owen Howlett—I am curios about how much documentation you found. I have always had the impression that there is very little there, but I don't know if I just never have the time to dig deep enough.

Annette Beitel—Part of the problem with even the documentation that *is* available is that it is not liked at all to the measures, so it becomes virtually impossible to review the validity of even a single parameter.

Spencer Lipp—On the idea of "DEER Power Users." I think we should strive to have a system that most users can use—you should not need a Ph.D in DEER to be able to develop measures or run programs in California. This is a very dynamic industry; you want to encourage new people and engineers coming in all the time.

John Proctor—We just measure the effect of whole house fans over three years. They are incredibly good in some places, like Stockton, and really cost effective. I get really nervous when people choose to use models—any model—when there is solid empirical data available.

- ACT: Add Whole House Fans with real data to potential 2016 measure list.

Pierre Landry—Back to the documentation issue: If they did look at the Proctor Engineering study and judged the data less than "best available"," that should still be explained as part of the measure characterization.

And on the degradation factor, you would also need to take into account the degradation rate of the base case equipment. It's likely that the less efficient equipment actually degradates faster.

Owen Howlett—That's a great point. We typically know more about the measures than we do about the baseline. So it begs the question of how using "best available data" for each creates a systematic conservative bias.

Gary Fernstrom—Would you consider the QSynch EC motor technology to be electronically commutated?

Christopher Rogers—Yes.

Tim Melloch—What I haven't seen is any cost data on the measure.

John Proctor—The claim is that they are substantially less expensive.

Gary Fernstrom—Plus, you don't have to wind them.

Armen Saiyan—So, are both DEER and POU TRM LED MR 16 assumptions based on professional judgment, not empirical data?

Tim Melloch—Correct.

Alina Zohrabian—I believe that the latest CPUC Staff disposition on lighting used the lowest value available from ENERGY STAR.

Armen Saiyan—Other jurisdiction TRMs also have this type of measures. Are any of those values based on actual data?

Tim Melloch—I would have to go back to the actual TRMs and investigate that.

- ACT: Cal TF staff to follow up with Armen Saiyan about LED MR 16 assumptions in other TRMs.

Spencer Lipp—You have uncovered something very important. EULs end up having more impact that the actual lifecycle savings estimate parameters. Most of the EUL estimates are criminally out of date and we need to start addressing those much more quickly than we actually are.

Pierre Landry—This goes back to a discussion we've been having in the Best Available Data subcommittee. Those EUL values probably made sense when they were negotiated for other uses decades ago.

Doug Mahone—But even then, using those negotiated values as we do now in the potential study is going to eventually lead to building power plants that won't actually be needed.

Annette Beitel—Which brings up a message that the PAC asked mo to bring back to this group from their meeting in October. At our last TF meeting, the group directed a workpaper developer team to use DEER savings values despite the fact that they were replicable. While the TF did request that the lack of documentation be noted in a footnote, the PAC wanted me to remind you that technical rigor and independence should always be this group's leading goal.

Pierre Landry—Well, sometime the reason for measurement affects the result being measured.

Annette Beitel—That may be the case, but the PAC's message is really about technical independence being one of the Technical Forum's chief goals.

Assemblymember Bill Quirk—I fully agree with the PAC's message. We sorely need an independent technical body like this one in California's energy efficiency space.

John Proctor—And even in the cases when there isn't enough data, we can highlight and document what information is needed. That is still a very valuable input.

IV. Electronic Technical Reference Manual Proposal

Annette Beitel, Cal TF Facilitator—

PowerPoint Presentation

John Proctor—I would warn you not to lock yourself into EnergyPlus on the residential side. I really don't think the tool is dependable for that segment yet.

- ACT: Cal TF staff to review use of EnergyPlus for residential modeling.

Owen Howlett—What do you mean by creating workpapers for the 17 DEER measures?

Annette Beitel—We mean fully documenting those measures—not necessarily at the complex length of current California workpapers.

Spencer Lipp—Is there not an overall cost savings that would come from this new tool? I mean, how much money do we currently spend on figuring out how to apply the methods contained in those 17 DEER measures?

Annette Beitel—Yes, I think there would be significant cost savings.

Doug Mahone—And who will perform the documentation work?

Annette Beitel—We think the work should be performed by a combination of Program Administrator staff and engineering consultants.

Owen Howlett—Will the new workpapers contain some of the data quality and complexity standards that Pierre was alluding to earlier?

Annette Beitel—We will definitely depend on those guidelines, but they won't necessarily be within the measure characterizations. That type of guidance is usually included as front matter in TRMs.

Assemblymember Quirk—I think this proposal is a no brainer. What my colleagues and I are really interested in is real data, so I hope the new TRM will allow for better integration of that type of information.

Pierre Landry—If I may ask you, why are you interested in real data?

Assemblymember Quirk—Because we want actual effective measures.

Pierre Landry—So its not like you need to know the difference between 3.9 and 4.1?

Assemblymember Quirk—No, false precision like that is a waste of money. But some of the numbers we currently use, particularly with heating and air conditioning, are off by several orders of magnitude.

Pierre Landry—But right now the policy guidance is to exhaust all available resources for each measure estimate.

Assemblymember Quirk—I think if you are clear with the regulators they will understand. And the problem is that with many of the numbers is that you can't tell where they come from. If you can't tell where it comes from, it's not a real value, and you shouldn't use it.

Doug Mahone—It seems to me that part of the move to the electronic TRM should be the creation of solid, dependable guidelines for measure documentation and development.

Annette Beitel—We couldn't agree more with that, which is why we have been working on developing best available data and measure complexity guidelines in subcommittee. We know those will need to be finalized as we begin the measure development and review work for the electronic TRM.

Larry Brackney—OpenStudio is on the precipice of cracking the measure complexity nut via making parametric analyses much more available to measure developers.

Pierre Landry—I can not stress enough that maintenance will be just as important as building the tool. DEER was a good database until it fell out of date.

Annette Beitel—Mike Myser of Energy Platforms is here. Mike, do you have any thoughts on this?

Mike Myser—This is a very complicated data management questions. The group is probably not ready to make a decision on platform right now, but you have done a great job on a lot of the groundwork.

Annette Beitel—Does the Technical Forum approve this Technical Position Paper and the proposal to create a new electronic TRM?

Group—Yes.

- ACT: **TF approval of Technical Position Paper No. 2 and Electronic Technical Reference Manual proposal.**

V. Savings To Code

Alejandra Mejia, Cal TF Staff—

PowerPoint Presentation

- ACT: **Cal TF affirmation of Technical Position Paper No. 1.**

VI. VRF

Jeff Hirsh, CPUC Ex Ante Consultant—

PowerPoint Presentation

Armen Saiyan—It seems like your first two issues with the measure are actually the goals of the program: Changing to a VRF system and away from the main fuel.

Jeff Hirsh—Well, those are the unproven assumptions that we're looking to see validated.

John Proctor—So are you saying that you don't think that VRF systems will go in to replace conventional gas pack systems?

Jeff Hirsch—I am saying that they might, but in an unknown percentage of cases.

Pierre Landry—As a function of the upstream program design?

Jeff Hirsh—Yes.

Dina Mackin—Why is the fan being utilized less in the VRF case?

Jeff Hirsch—Because there is more variability of load.

Gary Fernstrom—So what you are looking for is assurance that the program chooses one technology over another?

Jeff Hirsch—Well, not quite that far. What I was trying to do is separate the baseline definition issue from the program attribution question. What I would like to see is survey data on what influenced the choice of equipment.

Spencer Lipp—Isn't that putting ex post into the ex ante calculations?

Jeff Hirsh—Well, if you want to claim ex ante savings...

Armen Saiyan—What is the Title 24 standard for this?

Jeff Hirsh—Title 24 would require heat pumps. I think that may be one of the right baseline choices.

From the phone—The typical service requirement in rental contracts is "adequate ventilation." Why wouldn't that be the right level of service?

Jeff Hirsch—It may be. We just don't have the data to show it is.

Pierre Landry—So, in the course of attempting to gather the baseline data you may get some insights into attribution.

Assemblymember Quirk—I think the data you are requesting would all be great to have. Please let me know if I can be of any help in gathering it.

Jeff Hirsch—Well, I think a well-designed survey instrument would be able to capture the data in a few months. I think the real problem is a lack of initiative to go get it.

Mangesh Basakar—I think it would be possible to gather that data. The question is if this is the level of granularity and information we require of other technologies.

Jeff Hirsch—No, we don't require this level of granularity for every technology. However, this is a complicated measure that is now high impact, so we would like to get a more precise estimate on savings moving forward.

Steven Long—Has anyone done a cost effectiveness analysis to try to figure out if it is even worth investing the resources to collect the data?

Jeff Hirsch—We've done that.

Annette Beitel—So what's the range of TRCs?

Jeff Hirsch—Well the result is a broad range of what it could be.

Assemblymember Quirk—I think implicit in your list is the usage before and after. It should really be made explicit.

Annette Beitel—So what I'm hearing is that the group would like to add 1) a cost effectiveness estimate and 2) energy usage. Are those plausible?

Mangesh Basakar—I think it is possible to gather the first few items on Jeff's list, but I don't know if that is true if the last few items.

Spencer Lipp—Does making the fuel switching change make the technology fail the cost effectiveness test?

Jeff Hirsch—I don't know off the top of my head.

Assemblymember Quirk—It seems like you already have some of the answers through your engineering analysis. I think you already said that most of the savings come from the fan.

Jeff Hirsch—No, most of the modeled savings in the workpaper come from the fan. The problem is that we don't know where the savings come from empirically.

John Proctor—Let's assume that there is some analysis that says that many of the modeling assumptions in DEER are wrong. Is there any way out of request number 2 (slide 11)?

Jeff Hirsch—Yes. That would have to be gathered and folded into the next version of DEER. Nothing is ever perfect and it is our job to tweak the tool to continuously improve it.

Annette Beitel—How would we bring this to the ex ante team?

Jeff Hirsch—Bring it to us during the official DEER update process.

Annette Beitel—We need a process where we can actually discuss the various observations and sometime conflicting opinions. I think we all agree that the paper-based back and forth we've had so far is very inefficient.

Jeff Hirsch—Well, Annette, you know I was already very reluctant to come discuss this measure because it's been three long years of trying to get PG&E to do as we asked them.

Armen Saiyan—Are your modeling capability concerns limited to the heat exchanger?

Larry Brackney—The new model in EnergyPlus does address the heat exchangers.

Jeff Hirsch—It still gives the wrong answer

Larry Brackney—Well, the old model does get it right.

Jeff Hirsch—No it doesn't.

VII. Closing