California Technical Forum (Cal TF)
Technical Forum (TF) Meeting #10
May 28th 2015
NRDC, 111 Sutter St.
San Francisco, CA
94117

I. Participants

In Person

Annette Beitel, Cal TF Facilitator
Jenny Roecks, Cal TF staff
Alejandra Mejia, Cal TF staff

Doug Mahone, TF Member
Spencer Lipp, TF Member
Sherry Hu, TF Member
Christopher Rogers, TF Member
Ron Ishii, TF Member
Armen Saiyan, TF Member
Yeshpal Gupta, TF Member
David Springer, TF Member
David Pruitt, TF Member
Larry Kotewa, TF Member
Pierre Landry, TF Member
Mary Matteson Bryan, TF Member
Srinivas Katipamula, TF Member
Bing Tso, TF Member
John Proctor, TF Member
Bruce Harley, TF Member
Martin Vu, TF Member
Steven Long, TF Member
Bryan Warren, TF Member
Grant Brohard, Incoming TF Member
Jesse Martinez, Incoming TF Member
Owen Howlett, Incoming TF Member
Ed Reynoso, Incoming TF Member

Andres Fergadiotti, Presenter, Southern California Edison (SCE)
Alfredo Gutierrez, Presenter, SCE

Jia Huang, Presenter, Pacific Gas & Electric (PG&E)
Lucy Morris, Presenter, PG&E
Eric Ruben, Presenter, Energy Solutions

Christine Hanhart, UCONS
Jon Lanning, Trickle Star
Mike Myser, Energy Platforms
Martha Garcia, Southern California Gas (SCG)
Rob Kasman, PG&E
Rick Ridge, Ridge & Associates
Brian Smith, PG&E
Eli Caudill, Conservation Services Group
Anthony Hernandez, SCE
Chris Li, PG&E
David Shallenberger, Synergy Companies
Jeff Gleeson, Nest Labs

On the Phone
Brandon Tinianov, TF Member
George Roemer, TF Member
John McHugh, TF Member

Paula Gruendling, CPUC Energy Division (ED)
Andy Fessel, PG&E
Fred Coito, DNV GL
Rocaciano Vega, RMS Consulting
Todd Malinick, EMI Consulting
Chris Ganimian, Energy Analysis Technologies
Dale Gustavson, Western HVAC Alliance
Rocky Harmstead, SDG&E
Chan Paek, SCG
Scott Higa, SCE
Dominico Gelonese, Embertec
Sean Ong, EMI Consulting
Buck Taylor, Roltay Inc. Energy Services
Josephine Unverferth, SDG&E

II. Key Decisions and Action Items

Process Update to the TF

- ACT: In the future Cal TF staff will inform the TF of comments it plans to file if time allows. However, TF approval is not to be requested before filing comments. In addition, Cal TF staff will continue to make clear in any comments it files that the comments represent the views of staff, not the full Technical Forum.

RPP Workpaper

- ACT: RPP workpaper to clearly explain distribution of program costs and incentives between customers and retailers and reasoning behind that distribution, and clearly identify which costs will be treated as admin versus incentive costs.
- ACT: **EUL values and methodologies approved for a one year period.**
  - [Post meeting note: – Cal TF may need to re-visit approved EULs if product removals have to be included in EULs rather than GSIA.]
- ACT: Jia Huang to follow up on DOE rulemaking and report back to TF.
  - [Post meeting note: DOE rule uses the same sources for EULs as reported in RPP team slide deck.]
  - [Post meeting note: Cal TF will need to re-visit EULs given subsequent Commission staff direction that EULs should include product removal/installation rates. However, Cal TF staff does need to clarify with Commission staff what is "bright line" rule about when product removal/persistence information should be included in EUL and when it should be included in GSIA.]
- ACT: Cal TF staff to research and report status of IMC values in READi and whether IMC values in recent Itron study should be used.
- ACT: **IMC values and methodology approved for a one-year period. However, cost data in year 2 must also include information about product IMCs in brick and mortar stores to calibrate web harvesting.**
- ACT: Set of experts to be interviewed in the future to be broadened when evaluating whether Energy Star is a product attribute that influences product pricing. In addition to EPA and manufacturers, include sales professionals at a minimum.

Commercial Tier 2 Advanced Power Strips

- ACT: Cal TF staff to follow-up with CPUC staff to get "bright line" staff ruling on when product removal/product persistence should be accounted for the in the EUL rather than the installation rate.
- ACT: Workpaper developer to investigate the distribution of Power Management software in the sample baseline and determine

representativeness of baseline for customer population targeted by program.

- ACT: Workpaper developer to modify the measure eligibility criteria to require a) field testing of devices from each manufacturer to ensure that the distinct control strategies used by each manufacturer produce the expected savings, and b) the ability of the manufacturer-specific APS to put controlled device to sleep.
- ACT: Workpaper developer to inquire with SDG&E to see if a commercial customer acceptance/persistence study can be done after one year of operation to assess persistence, customer acceptance and savings in different commercial environments.
- ACT: Workpaper developer to get clarification from Commission Staff on when measure persistence should be included in the installation rate (GSIA) and when it should be included in the EUL.
- ACT: Workpaper developer to get feedback from Staff on 8 year DEER EUL value for commercial power strips.

Residential HVAC Quality Installation

- ACT: Andres to return to TF with a simplified approach to calculating savings that either: 1) uses logical groupings to reduce number of measure permutations or 2) uses empirical analysis rather than just modeling.
    - Refer to Energy Upgrade California's approach for approach that yields fewer measure permutations.
- ACT: John Proctor to work with subcommittee on alternate approach that would rely on empirical analysis rather than modeling.

Smart Thermostats EE Measure Approach Overview

- ACT: Jesse Martinez to share SCG project description for TF review.
- ACT: IOUs to complete presentations in July meeting and discuss next steps and timing with TF.
- ACT: Cal TF Staff requests that workpaper developers provide all research they have done or collected on savings and customer acceptance of Smart Thermostats, including E-Source reference lists, Puget Sound study, and any other studies underway from Navigant.

III. Process Update to the TF

Annette Beitel—Cal TF staff has filed formal comments on DEER and informal comments on "Below Code" savings opportunities with the CPUC. The

comments are based on the work done by Cal TF staff and reflect the views of the Cal TF staff, not the full TF. The purpose of the comments is to communicate work that is being done through the Cal TF and to get it on the record, should the information be useful or relevant to issues the Commission is deciding. Cal TF staff, not the Technical Forum itself, has been and will continue to be the filing entity for all comments.

Pierre Landry—I am glad that you set the precedent for filing the comments without asking the PAC for approval. I think that is an important step that underscores our independence.

Doug Mahone—Does the new party status affect the group's independence or freedom to operate at all?

Annette Beitel—While Cal TF staff is now subject to the limitations of formal parties to the rulemaking, the Technical Forum is not.

Pierre Landry—I'm thrilled that you did this. I keep hearing from my colleagues that they are all glad that his information is now on the record. I also believe that the way you did it will allow us to keep our independence and nimbleness.

- ACT: In the future Cal TF staff will inform the TF of comments it plans to file if time allows. However, TF approval is not to be requested before filing comments. In addition, Cal TF staff will continue to make clear in any comments it files that the comments represent the views of staff, not the full Technical Forum.

Annette Beitel—On to the next sub-item, we will be sending out a very open-ended survey money in the next few days. We really want to hear your qualitative thoughts about how the process has gone so far, what you have found valuable from participating, and what you would like to see as we move on to the next term.

Steven Long—Have you considered surveying others for feedback on our process so far?

Pierre Landry—It would be interesting to survey applicants who were not selected.

Annette Beitel—Those would be different projects than the survey we will be distributing to you, but you are of course more than welcome to suggest other surveys in your responses to this one.

Lastly, we always try to give all credit where credit is due. However, as we move forward with publishing our work in other venues, please let us know if you ever feel like we're co-opting your ideas and/or you would like to get more credit for your work. That is not our intention. Please speak up if you would like your name included on published or public documents produced through the Cal TF. .

IV. RPP Workpaper

Jia Huang, Pacific Gas & Electric—

PowerPoint Presentation

Grant Brohard—Have you ensured that your sources use the same definition of EUL as DEER?

Rick Ridge—Yes, they all define EUL as the median lifetime of a measure.

- IMPORTANT POST_MEETING NOTE: Cal TF staff researched the definition of EUL in California and it is not median lifetime of a measure. The definition of EUL in California is:
  An estimate of the median number of years that the measures installed under a program are still in place and operable.

  Thus, the EULs adopted by the Cal TF need to be re-visited in June to subtract measure removal. The RPP team will need to research persistence studies and subtract from the adopted EULs.

Paula Gruendling—Is the group aware that the set of products in the ET trial are different than the set of products in this version of the workpaper?

Rick Ridge—I believe the public version of that study will be posted in the next few days.

Todd Malinick—The only products in our current mix that were not in the ET trial are clothes washers and dryers. PG&E has done extensive research on those two so they are comfortable with their estimates on those. The products from the ET trial that did not perform well, like BluRay players, were dropped from the mix in this workpaper.

Annette Beitel—Just to clarify, the TF will not be reviewing the RPP product selection. Cal TF is reviewing technical information and values, which includes ex

ante methodologies and measure values for EULs, UESs, IMCs and NTGs. We need to hear from Rick and Todd whether there are any findings in the just-released Emerging Technology study that relate to methodologies and values Cal TF is reviewing.

Todd Malinick—The ET study did not look at IMCs or EULs, which are what we are asking the group to approve today.

Steven Long—Should we be providing incentives for measures that have IMCs of zero?

Rick Ridge—It's important to keep in mind that we are trying to overcome costs other than just product costs. We are looking to affect the behavior of retailers. However, we are working to make sure our E3 calculators reflect all of these costs appropriately. This will all be detailed in the IMC white paper.

Annette Beitel—All of the approvals Cal TF makes today are contingent on TF members being provided the ET report and having the chance to review it to determine whether any of the information in the report could or should inform the methodologies and/or values that the TF is reviewing today.

Steven Long—In light of that, should we also wait to review the IMC white paper that Rick just mentioned?

Rick Ridge—That white paper just explains our methods for treating costs that do or do not get passed down to the customer. For instance, the program costs designed to directly affect retailer behavior, which should affect customer behavior indirectly.

Steven Long—How do those differ from a mid-stream HVAC program?

Rick Ridge—I'm guessing that those are treated as an admin cost.

John Proctor—And even if they aren't, maybe they should. Rick is making an important point that reducing product costs are not the only kind of change we are trying to effect.

Pierre Landry—So to flip that around, we are trying to incent more than just purchasing expensive equipment.

Spencer Lipp—Therefore, fitting our program rules into the reality of the market would be the wrong approach in this case.

Rick Ridge—And what we're buying down here isn't the incremental cost. It's the different margin that is faced by the retailer. It's about changing stocking practices and knowledge.

Steven Long—I would suggest that you make that point clearer in the workpaper.

- ACT: RPP workpaper to clearly explain distribution of program costs and incentives between customers and retailers and reasoning behind that distribution, and clearly identify which costs will be treated as admin versus incentive costs.

Annette Beitel—I'm going to suggest that we really focus today on seeking TF approval of the EULs, since those seem very clear and concrete, and then the IMC methods and values. We can defer the UES methods and values pending TF review of the ET study.

So, are there any objections from TF members about the EUL values and methodologies on slide 6?

Bing Tso—I am just wondering why the source for air cleaners is so old.

Jia Huang—There has not been much change in that product since 1998.

Rick Ridge—And we were not able to find any more recent sources.

Annette Beitel—Our standard *is* best available information.

Jesse Martinez—With regards to the Appliance Magazine source, was it an article or a report?

From the phone—Appliance Magazine does periodic market research reports. These are very robust, even though they are often presented as articles in the magazine.

Group—Approves EUL values and methodologies.

John McHugh—I would also recommend that you double-check that the recent DOE rulemaking on dryers and washers does not set an EUL.

- ACT: **EUL values and methodologies approved for a one year period.**
- ACT: Jia Huang to follow up on DOE rulemaking and report back to TF.

- [Post meeting note: John McHugh distributed an excerpt of the DOE rulemaking to the group during the meeting. The email also included a link to the rule.]
- [Post meeting note: DOE rule uses the same sources for EULs as reported in RPP team slide deck.]
- [Post meeting note: Cal TF will need to re-visit EULs given subsequent Commission staff direction that EULs should include product removal/installation rates. However, Cal TF staff does need to clarify with Commission staff what is "bright line" rule about when product removal/persistence information should e included in EUL and when it should be included in GSIA.]

Eric Ruben, Energy Solutions—

Power Point Presentation

Doug Mahone—I recently heard that DEER IMCs are no longer being used by PAs. Is this correct?

Steven Long—I don't know if the Itron IMC study is on READi yet, but we have been told to use those values in our workpaper updates. We have also been told not to use DEER 2008 IMC values if they can't be substantiated.

Annette Beitel—Since this seems to be unclear right know, we will follow up with our Energy Division counterparts and report back to the TF.

- ACT: Cal TF staff to research and report status of IMC values in READi and whether IMC values in recent Itron study should be used.

John McHugh—I've found in the past that the values found from the web harvesting for LEDs tend to be higher than the prices in the big box stores.

Rick Ridge—Studies are being planning to answer John's question—to fine-tune what adjustment factor we should be using in the future.

Brian Smith—Yes, once we actually launch the product we will have access to historical brick and mortar data to allow us to do this kind of work.

John McHugh—So it sounds like you have an extra stage in your IMC methodology to do that kind of adjustment. It makes sense to me to include that step.

Brian Smith—The reason that step isn't included in our current proposal is because we won't be able to do that in the first year, which is what we're asking you to approve at this point.

Yeshpal Gupta—I'd also say that the difference between web and brick and mortar prices is likely to go both ways.

Bruce Harley—Is there a substantive difference with adding the ENERGY STAR attribute back in at the end of the regression process?

Eric Ruben—I'd say that *if* ENERGY STAR survives our process all the way to the end, then there is definitely no question that it is an efficiency attribute.

Pierre Landry—Who were the experts you interviewed to help evaluate whether the ENERGY STAR designation impacting product pricing?

Eric Ruben—We interviewed EPA product leads and manufacturers, in the future we would like a broader range, including sales professionals. All of this is detailed in the IMC report.

Doug Mahone—How did you deal with both the measure and base cases?

Eric Ruben—Our multiple regression approach allows us to account for all the different cases simultaneously.

Bruce Harley—But then you have to know which attributes affect efficiency. If none of the attributes that you find affect efficiency, what will be your inputs?

Eric Ruben—Including both energy efficiency and ENERGY STAR would create problems with multi-colinearity.

Steven Long—Will there be any cross effects with downstream rebates being offered for the same equipment?

Brian Smith—No. We purposefully will not be offering incentives for any product already being rebated.

Doug Mahone—What if efficiency is a linear value, rather than the ENERGY STAR binary variable?

Rick Ridge—While that is a factor, the virtue of using ENERGY STAR is that it is free of measurement error and available to all of the products in our current mix.

Pierre Landry—And it's also a matter of what will actually be used as a criterion by the purchaser. I'm sure most customers will go for the binary ENERGY STAR label.

Doug Mahone—But why does the purchaser's decision affect the deemed IMC?

Pierre Landry—I don't think the people setting the price on the equipment are looking at more than the binary proxy for efficiency.

Ron Ishii—Is the binary variable a bias for the equation?

John Proctor—It's not necessarily a bias, it is just giving you a simplification for the whole category.

Eric Ruben—It isn't changing the slope of the equation.

Doug Mahone—So you're saying that price is largely based on the label?

Eric Ruben—Yes, and that assertion is supported by all of the correlations we have found so far.

Sherry Hu—I would like to congratulate you for developing this new methodology. I think it may be an answer to a question that the whole industry has been struggling with for years.

Pierre Landry—I'll echo that and warn that performing an Itron-scale IMC study for all of these measures as frequently as is needed by this program would be prohibitively expensive.

Annette Beitel—Do you think this information may have the unintended consequence that manufacturers and retailers may stop making efficient appliances if they learn their customers don't care?

Todd Malinick—I think in some ways that's the point of this program: to make customers care about these other attributes.

Annette Beitel—So, does the TF feel comfortable approving the values on Eric's slide 27 as well as the methodology with the mention that in the future web crawler values will be calibrated with brick and mortar data and that the set of experts also be broadened in the future?

Group—Yes.

- ACT: **IMC values and methodology approved for a one-year period. However, cost data in year 2 must also include information about product IMCs in brick and mortar stores to calibrate web harvesting.**
- ACT: Set of experts to be interviewed in the future to be broadened when evaluating whether Energy Star is a product attribute that influences product pricing. In addition to EPA and manufacturers, include sales professionals at a minimum.

V. Commercial Tier 2 Advanced Power Strips

Martin Vu, RMS Consulting for San Diego Gas & Electric—

PowerPoint Presentation

Steven Long—Do you know what type of equipment and network was being used in the trial? I think both of those would affect baseline data collection.

Martin Vu—I would have to get back to you on those specifics. However, a pertinent clarification to make at this point is that the devices used in the trial actually collected both baseline and measure data. The devices are capable of sensing what the usage would have been had it been functioning under the measure case.

Owen Howlett—How would the device know when the computer would have gone to sleep on its own?

John Proctor—My understanding is that the device didn't actually turn the equipment off; it just simulated usage had it turned the equipment off.

Annette Beitel—Did the Australian study estimate the time it took for the devices to get taken out of service?

Martin Vu—Yes, the majority of the customers took out the devices within the first three months. A recent Canadian study on residential customers gives a lower out of service rate, but the IOUs are really interested in regional data.

- [Post-Meeting Note: The statement about the Canadian study is erroneous. Cal TF staff checked the Canadian report and determined that the study did not collect independent data, but instead relied on an Australian study. The Australian study referenced in the Canadian study

did not report a lower product removal rate. The product removal rate in the Australian study was 28% in the first year. Cal TF also found a more recent Australian study that indicated a higher product removal rate of 33% due to customer dissatisfaction with the device.]

Bruce Harley—It seems to me that power strips are not an inherently new product. You may be able to use existing data from Tier 1 power strips as long as you separate the in-service rate.

- [Post-meeting note: Cal TF staff researched power strip EULs in the over 20 TRMs it has collected. The results of the research is posted on the Cal TF website]

Martin Vu—That's a good point. I believe the IOUs used an 8 year EUL for the Tier 1 measure.

Annette Beitel—Looking specifically at what Staff said, they want an EUL that means that 50% of the units remain in service. So it really is an In Service Rate (ISR). Given that it is a pretty promising measure, I would suggest that you build the in service rate into the DEER EUL and use that in the meantime.

Group—Disagreement on interpretation of Staff guidance and proper definition of (ISR) and EUL.

- ACT: Cal TF staff to follow-up with CPUC staff to get "bright line" staff ruling on when product removal/product persistence should be accounted for the in the EUL rather than the installation rate.

John Proctor—I also have misgivings about your measure definition. The measure definition does not guarantee that the other equipment from different manufacturers will create the same savings.

Martin Vu—That is why Cal Plug requires field-testing. The field tests of each smart strip from different manufacturers assess whether the different control strategies yield the expected savings. .

Jon Lanning (Tricklestar)—Yes, our product is currently being field tested to provide the type of data that came out of the Embertec test. We are also hoping to perform a pre and post test that will further clarify the savings.

Annette Beitel—The group's approval of the residential workpaper in February was contingent on requiring that products undergo field testing per Cal Plug's roadmap.

Anyway, we should probably not conflate residential and commercial. I think right now the most pressing question is if the group is comfortable with using the DEER EUL in the commercial workpaper.

Annette Beitel—My interpretation of Kevin Madison's guidance is that you need more analysis of the EUL issue.

Spencer Lipp—We're supposed to use DEER when available. Why wouldn't we use DEER in this case? It seems to be the consistent response.

However, I will refrain from making a recommendation on this issue, since my company does participate in this program.

John Proctor—We need to keep EULs as EULs, and use ISRs to subtract the percentage that gets pulled out.

- [Post-meeting note: Cal TF staff needs to clarify with Commission staff when EULs should include product removal rates].

Steven Long—Traditionally ISR surveys count the number of widgets that are still plugged in 12 months later.

Pierre Landry—So it seems like Martin's current methodology is consistent with that ED definition.

Annette Beitel—It seems like the group is recommending that the 8 year DEER EUL should be reduced by the 28% product removal rate from the Australian study.

Annette Beitel—Any other objections to approving the commercial workpaper?

David Springer—What are the baseline assumptions for power management settings?

Martin Vu—I believe the timer was set for one hour, after which a dialog box would announce sleep mode would start in five minutes.

Armen Saiyan—Does the savings change depending on different energy management software?

Martin Vu—We could definitely tease that out from the data we already have. The sample just gets smaller the more specific we get.

Annette Beitel—A very tight distribution of savings would indicate that existing power management software wouldn't affect savings.

Annette Beitel – Based on the group discussion and open issues and questions, the commercial smart strip workpaper is not ready for approval; further work and analysis needs to be done. Thus, I will not be seeking TF approval of the workpaper at this time. I hope that the workpaper developer can return to the TF at the next meeting with responses to the issues TF has raised so that the workpaper can be approved in the June TF meeting.

To summarize the TF's recommendations:

- ACT: Workpaper developer to investigate the distribution of Power Management software in the sample baseline and determine representativeness of baseline for customer population targeted by program.
- ACT: Workpaper developer to modify the measure eligibility criteria to require a) field testing of devices from each manufacturer to ensure that the distinct control strategies used by each manufacturer produce the expected savings, and b) the ability of the manufacturer-specific APS to put controlled device to sleep.
- ACT: Workpaper developer to inquire with SDG&E to see if a commercial customer acceptance/persistence study can be done after one year of operation to assess persistence, customer acceptance and savings in different commercial environments.
- ACT: Workpaper developer to get clarification from Commission Staff on when measure persistence should be included in the installation rate (GSIA) and when it should be included in the EUL.
- ACT: Workpaper developer to get feedback from Staff on 8 year DEER EUL value for commercial power strips.

VI. Residential HVAC Quality Installation

Andres Fergadiotti, Southern California Edison—

PowerPoint Presentation

Owen Howlett—A question about the baseline. Doesn't Title 24 required duct testing and/or sealing?

Andres Fergadiotti—Yes, replacing the coil, condensing unit, or major renovations to the duct would trigger those code requirements. Since this is a replace on burnout measure, our base case is the Title 24 base case.

Annette Beitel—Can you explain to the group why the subcommittee is recommending that the workpaper use data that is not from WO 32?

Andres Fergadiotti—Basically, Edison's program data set is much larger and more representative of program effects. The procedures WO 32 used to collect the data on the base case are much more robust—significantly more manual S tests were conducted on the measure case group. The baseline data is expected to be more representative based on actual performance in the field.

The overall goal is to evaluate WO 32 data, Edison program data, *and* all other available data to select the best available sources.

Annette Beitel— You propose not using Title 24 as the base case. What is the argument for this?

Andres Fergadiotti—We suspect, based on permitting rates, that the base case is actually very different.

Airflow Performance (kW/CFM) Base Case

John McHugh—My understanding is that the 0.58 performance threshold was actually selected so that all products would pass, and that you cannot purchase an AC unit less efficient than federal code. Are you suggesting that your proposed approach would somewhat reduce static pressure? Why are we expecting that watts per CFM are dropping?

Buck Taylor—There are a lot of systems that would use the existing furnace to continue powering the refurbished system. So we would expect the static pressure to go down. It's not a pure fan replacement equation.

You *could* question the 0.58. The subcommittee picked that value in light of the dearth of data. Even WO 32 says that their sample was very small and likely to be biased.

John McHugh—Why are we using default values instead of measured data?

Andres Fergadiotti—We were unable to get program data for the base case.

Annette Beitel—Maybe the best approach here is to write the workpaper based on the current best available data, and recommend that programs require test-in to get base case data that can be used to refine the measure savings in the future.

John Proctor—Based on my experience, the current base case value is probably a pretty good estimation of what is out there right now. It is completely justifiable.

Duct Leakage

John Proctor—I think your approach on the air duct leakage methodology is great.

Chris Li—We have not been able to get Energy Division's detailed data on initial leakage from the PG&E program evaluation.

John Proctor—It's a very good number, especially for older homes. I also think your permitting assumptions are very true to life.

Spencer Lipp—I like your permitting rate assumptions, but is it representative of the contractors that would participate in the program?

Andres Fergadiotti—That's a good question, but this is the best available data at the moment.

Spencer Lipp—But you're running the risk that the contractors will tell evaluators three years later that they would have pulled the permit regardless.

Bruce Harley—But even if you have a very good contractor base, this percentage is about eight times more conservative than what everybody else is saying the actual rate is.

John McHugh—Why are you assuming that pulling a permit equates to 6% leakage?

Chris Li—The QI program requires the tighter sealing and program testing is pretty stringent.

John McHugh—Does the program require that ducts be replaced in cases that they are really bad?

Chris Li—That was piloted several years ago, but now the requirement is just performance. It is consistent with Title 24, just slightly stricter requirements.

Annette Beitel—So, are there any concrete suggestions for alternate base and measure case numbers or methodologies?

Group—None.

Annette Beitel—So, Andres, what model does the subcommittee recommend you use?

Andres Fergadiotti—We may look at TRNSYS. We are also validating Energy Plus's ability to model flow through a project with LBNL's Flex Lab.

John Proctor—I think we should compare the results from this modeling and compare them against actual field data to gauge accuracy.

Bruce Harley—I would second that, using as much empirical data as possible.

Annette Beitel—Do you plan to separately model all of the different climate zones, building types and vintages, etc.?

John Proctor and Bruce Harley—The approach would be to use the empirical data to calibrate and validate the modeling results.

Annette Beitel—Are there really significant enough differences between similar climate zones that you have to separately model for each of them?

Andres Fergadiotti—I don't think so, since the goal is to validate the actual model.

Steven Long—And it may not really make a material difference.

Alfredo Gutierrez—Energy Upgrade California grouped the different climate zones into four, and Energy Division was OK with that approach.

Andres Fergadiotti—We could also group the different vintages.

- ACT: Andres to return to TF with a simplified approach to calculating savings that either: 1) uses logical groupings to reduce number of measure permutations or 2) uses empirical analysis rather than just modeling.
    - Refer to Energy Upgrade California's approach for approach that yields fewer measure permutations.

Equipment Sizing

John Proctor—I think this is a good approach, but I believe there are approaches that will be more accurate.

- ACT: John Proctor to work with subcommittee on alternate approach that would rely on empirical analysis rather than modeling.

VII. Smart Thermostats EE Measure Approach Overview

Annette Beitel—This will be a very preliminary overview of the various IOUs' approaches with the goal of getting the group to spot any red flags early on in the process.

Lucy Morris, Pacific Gas & Electric—

PowerPoint Presentation

Pierre Landry—So your controls are going to be among the people who agree to participate?

Lucy Morris—Yes.

Steven Long, Southern California Edison—

PowerPoint Presentation

David Shallenberg—Do you plan to segment out the DR savings?

Steven Long—Yes. I don't anticipate this would be too problematic, since we know when the DR events are.

Annette Beitel—Why aren't you just looking at a weather-normalized approach?

Jesse Martinez—This Difference in Differences approach greatly increases the statistical significance.

John Proctor—Where is the interval data coming from?

Steven Long—Hourly smart meter data.

Pierre Landry—It's still not quite as robust as the randomized control trial.

John McHugh—What is the overall purpose of these studies?

Steven Long—The goal is to quantify the possible EE savings from these technologies.

John McHugh—Is there a post-installation customer satisfaction survey?

Steven Long—I don't know if that has been scoped in at this time.

Lucy Morris—PG&E will be doing several surveys, for both the test and control group. It will help us understand better how people will use the technology.

David Springer—Have you looked at the opportunity to log data? It would be useful for comparison against the whole home program data.

Steven Long—I believe there will be a limited opportunity for that.

John Proctor—It would be really helpful if you knew the call for cooling and were able to match that up to the trial data. This is going to be a small number no matter what and the manufacturers should be trying to do as much as possible to reduce the level of noise in the results.

Jesse Martinez, Southern California Gas—

PowerPoint Presentation

Pierre Landry—Can you walk us through your control group again?

Jesse Martinez—We started from a pool of 10,000 customers we reached for participation through the direct mail program. The control group are 300 customers who were defaulted into the control group because of network connectivity and password issues.

Pierre Landry—So it sounds like it's not a true match. I don't think this can be called a randomized control trial.

Spencer Lipp—Are you expecting around two to three percent savings? If yes, I'm concerned you won't be able to see that by using whole home data. There's going to be too much noise.

Jesse Martinez—That's why we'd like to try to complement it with another approach.

Bruce Harley—That's why it would be helpful to have the operational and weather data from Nest.

Doug Mahone—Weather normalizing is kind of a dark art. Isn't there a way to use a tracking approach like SDG&E used for APS?

John Proctor—Or you could do a flip-flop, between days on and days off the smart thermostat.

Spencer Lipp—That would confuse the customers a lot.

Pierre Landry—It would be really helpful to see a concrete project description to better understand your control group.

- ACT: Jesse Martinez to share SCG project description for TF review

Jeff Gleeson (Nest)—We appreciate the group's need for data, and we are very close to launching a data-sharing platform.

Ed Reynoso, San Diego Gas & Electric—

<u>PowerPoint Presentation</u>

Larry Kotewa—So you're not going to take Eco Bee's data?

Ed Reynoso—Eco Bee data is being shared with our evaluators, Nexant and Itron.

Katheryn Smith (SDG&E)—We were planning on using mostly whole home data.

Larry Kotewa—Because you can get a lot of set point and run time data from them.

Pierre Landry—And this is just electricity, not gas?

Ed Reynoso—Yes, the trial is limited to electricity cooling for this year.

Owen Howlett—Are you thinking about trying any of this on customers on non-tiered TOU rates?

Lucy Morris—Not at this point but it is something we are interested in.

Jesse Martinez—We too are hoping to get that data.

- ACT: IOUs to complete presentations in July meeting and discuss next steps and timing with TF.
- ACT: Cal TF Staff requests that workpaper developers provide all research they have done or collected on savings and customer acceptance of Smart Thermostats, including E-Source reference lists, Puget Sound study, and any other studies underway from Navigant.