California Technical Forum (Cal TF)
Technical Forum (TF) Meeting #1
Thursday, June 26th, 2014

I. Participants

TF Members:
Larry Kotewa
David Pruitt
Yeshpal Gupta
Martin Vu, RMS
George Roemer
Doug Mahone
Armen Saiyan
Pierre Landry
Ron Ishii
Bryan Warren
Bing Tso
Srinivas Katapamula
Tom Eckhart
Pierre van der Merwe
John Proctor
Scott Fable
Dylan Sullivan
Brandon Tinianov
Spencer Lipp
Andrew Brooks
Christopher Rogers
Mary Matteson Bryan
Jon McHugh
Ahmed Ganji
Sherry Hu
Steven Long

Observers and Non-Member Presenters:
Annette Beitel, Cal TF Facilitator
Jenny Roecks, Cal TF Staff
Alejandra Mejia, Cal TF Staff
Peter Miller, PAC Representative
Grant Brohard, PG&E
Katie Wu, CPUC staff
Steve Galanter, SCE

Gary Gero, Climate Action Reserve
Chan Paek, SCG

On the Phone:
Dan Rendler, SDG&E; PAC Representative
Martha Garcia, SCG
Andrew Steinberg, SDG&E

II. Key Action Items and Decisions

Process Action Items

- Discuss workpaper selection process.
- Conduct Survey Monkey to assess TF process in December
- Form crosscutting subcommittee to establish guidelines on how much detail/research needed for New Measure Workpaper.
- Modifications to TF Template
    - Incorporate initial TRC into Abstract Template.
    - Include page numbers in Abstract Template citations.
- Annette will follow up individually with members who must travel to attend meetings in person to assess their willingness to travel 3-4 times in first year rather than just first meeting.
- TF members will be asked to submit New Measures and other ideas for 2015 Cal TF work starting with the September meeting.
- **Decision:** Regular meetings will be on the fourth Thursday of every month, except for November, which will be on the third Thursday. No meetings will be held on August or December.

Abstract-Specific Action Items

Set Top Boxes

- Steven Long to provide more detail on the pilot: research plan, specific data acquired or forthcoming, and its applicability to workpaper baselines, hours of use HOU, demand profiles, etc.
- Brandon Tinianov to provide sustainability consultant contact information to Steven Long for potential data on STB life cycle assessment.
- SCE to consider logging as possible method for UES calculations
- **TF Decisions - Subcommittee to be formed to discuss details of the abstract, including:**
    - UES calculations

        - Data sources: NRDC study, data on STB life-cycle assessment from consultant referred by Brandon Tinianov, or additional data logging
        - Methodology: Calculations based on hours of use and power consumption in different operational modes vs. generalized load profile from logged data.
        - Accounting for different service provider settings, STB vintages, and STB modes
        - Impacts of consumer behavior on settings, usage
        - Appropriate level of detail to include in abstract and workpaper for UES given availability, cost, and accuracy of data sources
    - Program delivery – how to ensure attribution for early retirement, including consideration of software/STB setting requirements in addition to hardware requirements.
    - Measure cost – how to evaluate incremental measure cost
    - Effective useful life (EUL) approach options
        - Contacting service providers
        - Possible data on STB Life Cycle Assessment from consultant referred by Brandon Tinianov

<u>Advanced Power Strips</u>

- Yeshpal Gupta may have some data on power strip usage in university settings from Lincus and will look into it.
- Cal Subcommittee to discuss details of this workpaper
- **TF Decisions - Subcommittee to be formed to discuss details of the abstract, including:**
    - UES calculations
        - Baseline data sources: CalPlug studies, potential Lincus study, LBNL plug loads study, Energy Solutions study, or SDG&E to conduct a separate survey or logging study
        - Methodology: Using existing data vs. using the logging mode of some smart strips to conduct a field survey of energy usage and load profiles; consider weighting savings based on variations in number/type of plugged in devices and primary/secondary usage of plug location
        - Simplifying assumptions vs. collecting more data
        - Baseline expiration due to technology evolution of devices assumed to be plugged into power strip
        - Behavioral impacts on persistence of savings and baseline assumptions
    - Measure cost for direct install application

- Effective useful life (EUL) considering baseline expiration

LED Menu Boards

- Steven Long to get more info and submit information to a subcommittee, including:
  - Most recent research plan with research plan completion date.
  - Whether or not savings will differentiate by building type

LED Surface Panels

- Jon McHugh to send more information on lighting methodology to replace proposed abstract methodology.
- Workpaper developer should explore possibility of using a 1:1 luminaire replacement approach using lumens as a basis.
- Workpaper developer should explore possibility of using two baselines – one for early retirement and one for new construction/replace on burn-out
- **TF Decisions - Subcommittee to be formed to discuss details of the abstract, including:**
  - UES methodology
    - For two baselines: early retirement and new construction
    - Using code baseline in the case of new construction
    - Using a 1:1 lumens/luminaire replacement assumption in the case of early retirement
  - Measure cost – Consider the DEER cost study, surveying manufacturers, or other ideas.

High Efficiency Gas-Fired Unit Heaters

- Workpaper will use a 20-year EUL.
- Workpaper does not need to incorporate an over-sizing factor.
- Workpaper will use simplified engineering equation methodology, no eQuest modeling
- Measure will be offered for buildings with some sort of simple temperature control mechanism. Measure will not be offered to open spaces with no temperature control
- **TF Decision - Move forward with workpaper development.**
  - Do not incorporate an over sizing factor
  - Use engineering calculations and existing data without eQuest modeling
  - Address one building type - closed space with basic temperature control
  - Utilize a 20 year EUL

III. Opening and Introductions

Each attendee introduced him or herself.

Review Agenda and Meeting Objectives

Annette Beitel—I think we are all impressed with the amazing talent and experience in this room. Unlike the Northwest Regional Technical Forum (NW RTF), where 70% of members are from utilities, only four of our TF members work for utilities (One POU and three IOUs). Also unlike the NW RTF, we actively sought out-of-state representation. Fully 30% of our members are from out-of-state.

I also want to thank Katie Wu and Jaclyn Marks at the CPUC for helping us launch this effort. They have been very helpful and really great to work with.

Introduction to the Cal TF

Peter Miller—

Thank you all again for being here. This is a hugely impressive group of experts.

PowerPoint Presentation

I would like to also pass on a message from Art Rosenfeld. He congratulates you all for being here and tells you to get to work! He wants us to think about climate, think about behavior, move away from widgets, and remember cool roofs.

- History of ex ante database in California
- Brief look at the NW RTF
- Longstanding ex ante goals → Opportunities for improvement → Cal TF approach
- Opportunity to become a national model, especially with the implementation of EPA's rule implementing Section 111(d) of the federal Clean Air Act.

To echo Art, let's get to work!

Cal TF Process and Working Documents

Annette Beitel—This group is here to provide peer review of technical work. The group cannot usurp the final regulatory authority of the CPUC. We are also not looking to do the work of the IOU technical leads in the actual development of workpapers.

In 2014, this group will be dealing largely with two forms of documents: Workpapers and abstracts. Abstracts are a short description of the workpaper to be developed.

We are hoping to develop and use clear guidelines, templates, and forms to streamline and clarify the measure development process, similar to the excellent work that SBW did for the NW RTF.

Jon McHugh—Even if it's not ad hoc, there is still a judgment call that will need to be made about what is sufficient data.

Annette Beitel—To be specific, you will see with the 5 abstracts that we discuss today, that the presenters will call out exactly where they believe the data could be missing. The hope is that through our conversations we will arrive at reasonable methodology recommendations and savings estimates.

Doug Mahone—Let's keep in mind that this is for ex ante values, for planning purposes, the question is really "is it worth spending the money to gather more data to refine a forecast?"

Mary Matteson Bryan—Is there a formal review process of the abstracts from the CPUC?

Annette—Yes, as you can see in the flowchart, the two vital points for CPUC staff feedback are at the abstract stage and the draft workpaper.

Peter Miller—Lets keep in mind that we have no regulatory authority. Our authority will come from the technical quality of the work products. The program administrators will then go to their regulators or governing boards and be able to show them a highly credible technical estimate.

Tom Eckhart—Does the CPUC have any responsibility to act on the TF recommendations?

Annette Beitel—No. The hope is that what comes out of this process will be useful to and respected by all.

Ron Ishii—How will we be making decisions?

Annette Beitel—Based on research done about stakeholder groups across the nation, and on the strong preference of the CPUC staff and ratepayer advocate, we will be operating through consensus decision-making with “Comparison Exhibits” to memorialize non-consensus items The program administrator will make the ultimate decision about what values and approach to use when they submit their product to the decision-making entity—but they will have to say that they are going with the majority, minority, or deviating at all from our recommendations.

Armen Saiyan—How clear will the final work product be?

Annette Beitel—Very transparent. We will have a public website up very soon where the initial abstracts, workpapers and final versions can be easily accessed.

Ahmad Ganji—Will these workpapers be mostly for rebated measures?

Annette Beitel—Yes, initially we will be focusing on deemed, not custom measures.

Ahmad Ganji—Will only IOUs submit workpapers?

Annette Beitel—Anybody will be able to submit workpapers, because this is intended to be a truly independent entity. However, the reality is that we will have limits on how many measures we can review so we will have to put a selection process in place. Starting in September we hope to get workpaper suggestions/abstracts from TF members.

- ACT: Discuss workpaper selection process .

Jon McHugh—Will we be evaluating current calculation methods such as the LED savings estimate that is a function of the wattage of the LED incentivized instead of a model of the difference between the replaced wattage and the installed wattage?

Annette Beitel—The short answer is that for the pilot year we will focus on new measures. However, we will have to start working on the 2015 work plan, and we will be soliciting suggestions from this group for that. However, the TF is intended to provide peer review of technical issues, not program design issues. Since incentive levels relate to program design, Cal TF won’t be discussing incentive levels.

Bing Tso—How will we as a group self-assess?

Annette Beitel—Good question. I will recommend having a checkpoint meeting in December and we will have an anonymous survey using a tool such as "Survey Monkey" to facilitate that.

Peter Miller—Yes, great idea. We will always welcome suggestions, and Alejandra is the best person to communicate with on this sort of issue.

- ACT: Set up self-assessment process for the group for December meeting

Pierre Landry—You mention you would like this to be a national model. What is your vision for that?

Peter Miller—This will build on a lot of the great work being done already (Northwest, Illinois, etc.) in that it will be truly statewide but also well-coordinated with the entire West region and take advantage of the national perspective.

Annette Beitel—Walk through of the Abstract Template.

Doug Mahone—You have the program implementation section up, but you said that measures could be suggested by entities other than utilities. How will that work?

Peter Miller—I would caution us about reading too much into this section. It's not intended to be about the administrator business model, its more about highlighting any program implementation issues that could affect the savings estimate.

Doug Mahone—Is there any guidance about the granularity of information that will have to be included?

Peter Miller—That's one of the key issues that the RTF deals with. And that will be the sort of technical judgment that we expect to get from this group.

IV. Abstract 1: Energy Star 3.0, 4.0, and 4.1 Set Top Boxes—SCE

Steven Long, SCE, Presenter

Katie Wu—I have a question about the pilot: What is the status, will it be used for the baseline, etc?

Steven Long—I don't know all of the pilot details. We are collecting basic info on what's there, but I don't think it will be enough info to establish baselines.

Pierre Landry—Is there a research plan that can be reviewed?

Steven Long—Beyond the document embedded in the abstract, we will need to locate a more recent version with more details.

Dylan Sullivan—NRDC did an analysis of STBs with Ecova more recent than 2008. A concern is that the service provider determines the setting configuration for the STBs in its fleet. The workpaper might need a service provider-specific baseline. The fleet of STBs could be configured differently among service providers. It doesn't make sense to have a general specification among all service providers. Each service provider has a fleet of different ages.

Steven Long—Does the range of settings significantly impact energy usage?

Dylan Sullivan—Yes.

John Proctor—The service provider data is not the same as EUL data.

Dylan Sullivan—You may need a service provider-specific EUL, and you could probably get far discussing this directly with the service providers.

Steven Long—If the service provider is buying hardware from manufacturers, is there a different life for specific equipment?

John Proctor—The life ends when the service provider removes the STB from service.

Grant Brohard—When the STB is removed from service, it may be refurbished and pushed back into market.

Brandon Tinianov—I know a sustainability consultant who looked at life-cycle assessment (LCA) for STBs. This sustainability consultant could be useful to contact to get scrubbed data.

Tom Eckhart—Does the workpaper have an evaluation plan with more details?

Steven Long—The workpaper typically does not have evaluation plan. That could be part of a recommendation. The workpaper is usually for the estimated values.

Tome Eckart—If the assumption is that you don't have an evaluation plan, it would help to set a baseline by mode.

Steven Long—The workpaper will need to differentiate by mode for the unit energy savings (UES)

George Roemer—It may also make sense to have different hours of use (HOU) by mode for different vintage equipments.

Pierre Landry—If you have some kind of logger – like a smart plug load logger – you don't need to know the operating mode, you will know the load profile and can generalize to population.

Steven Long—We would need a lot of loggers to get a lot of load profiles.

Pierre Landry—You would be able to get bands around usage by vintage of equipment to use for ex ante – a logger would just plug in between the device and the wall.

Steven Long—I'll note logging as a possible method.

John Proctor—It seems like 1000 places (sample size) would be overkill. You could get decent estimates with less data. If there are only 4 providers, they would know how many boxes they have and how long they run.

Steven Long—You would think they would, but we don't know. The challenge is getting proprietary data from service providers.

John Proctor—You could call them A,B,C,D – if they want to participate in program, make it a requirement for them to give you the numbers.

Ahmad Ganji—Many measures like this will come to the Forum. It is possible to choose a sample before and then provide STBs to the sample participants so there can be valid statistical measurement.

Pierre Landry—Yes, that's what I was saying. That's why I wondering about pilot.

Steven Long—We're probably not doing that level of detail in the pilot, but rather just finding out what's out there.

Ahmad Ganji—The utility may want to provide an advanced system at no cost to the customer. They could provide the system, then get the data.

Dylan Sullivan—85% of new STBs meet the ESTAR 3.0 agreement – between NRDC and the cable industry. It is a fast-moving market, which presents challenges in measuring it.

Steven Long—If 85% meet ES 3.0, that's why we're not just doing new boxes.

Pierre Landry—There's a small window for program.

Steven Long—Yes.

Ron Ishii—How do you establish attribution in this fast-moving market?

Steven Long—Good question – when we do the ex ante adjustment, a fixed attribution is used (net-to-gross or NTG).

Grant Brohard—For an early retirement program, attribution is given for what the utility influences, and not normal turnover.

Pierre Landry—We need to find out the standard procedure from service providers, and how can the program accelerate that?

John Proctor—If there is only an EUL of 4 years, and you only get credit for 3 years, should you stop now since all boxes will be replaced within that window?

George Roemer—Will there be one savings value, one measure category that weights all estimates together? There seems to be several types – you could do an analysis to see if several groupings make sense.

Scott Fable—Do you know if the program will try to track what was replaced for each participant? Will the savings be based on specific mix? Or will you use an average deemed value for every replacement.

Steven Long—We will use an average. Otherwise there are too many variations/permutations. If the STB went from non-recording to recording, that level of detail may need to be addressed. Otherwise an average may be appropriate.

Armen Saiyan—With regards to interviewing a service provider versus doing a study – is it either/or? Or could you do both?

Steven Long—Probably one or the other since each would be expensive. Maybe in-field measurements is another option.

Jon McHugh—There is a Steven Chu article about technology that is far beyond what was agreed to in negotiations. Is ENERGY STAR V3.0 the target you are looking at?

Steven Long—Is there a higher version? 4.0?

Dylan Sullivan—Yes, there is a version 4.0

Steven Long—Then maybe we will have two levels, v3.0 and v4.0.

Dylan Sullivan—There are two levels – such as, if the DVR can spin down. Not just a version difference, but based on the specification from the service provider.

Pierre Landry—Can the consumer reconfigure the STB?

Dylan Sullivan—Yes, albeit with lots of difficulty.

Pierre Landry—That's a behavioral aspect- there will be a lot of reconfiguring if that's an option.

Doug Mahone—The distribution of usage could be very useful. Is the usage range wide, or can you get most of usage within a +/- band that is useful? With an average you are taking complex behavior and patterns and reducing them to a single point value. If you do not have a usage distribution of what the savings looks like, how do you pick one representative value?

Steven Long—It sounds like the group is favoring in-field measurement. Is this something we would tee up for a subcommittee?

Annette Beitel—We can talk about a subcommittee when the group is done discussing.

Steven Long—There is not a lot of data on cost. Our consultant has offered to collect the cost data. It will be difficult – there is the internal cost, cost to customer, and cost varies by providers. Cost needs more clarity. Any thoughts?

Jon McHugh—Potentially a cost analysis.

Pierre Landry—Installed cost will be significant, it would require a technician.

Grant Brohard—Comcast tells you to bring your box in to their office and they will give you a new one.

Jon McHugh—The question is on the energy side – the program measure you're looking at. The incentive could be based on settings in addition to the hardware itself. This brings us back to Pierre Landry's comment – do people override new settings? This is broader than just a piece of equipment (potentially).

Pierre Landry—Is part of the program to convince the service provider to adjust the settings?

Steven Long—We need to think about – that is more complex than what was being proposed.

Dylan Sullivan—The settings must be there, not necessarily preset, to qualify for ENERGY STAR 3.0 and 4.0.

Armen Saiyan—The settings are not locked out to consumer.

Pierre Landry—Is there a model that uses smart technology to learn usage habits of the consumer, and shuts down at night?

Martin Vu—There is content that needs to be fed to the box at night when people are asleep so they can access the data right away the next day. For the ENERGY STAR 4.0 spec there is a 5W, 5 second mode – within 5 seconds, when user turns on remote, uses 5 W…need to double check on that.

Pierre Landry —Is there a Version 4.0 in the market?

Martin Vu—They're developing it right now, I don't know if it's a beta version or currently out.

Grant Brohard—It currently takes 45 min to an hour – If you unplug then plug in the device, you need to wait 45 min to an hour for reboot.

Steven Long—Our proposed calculation approach is in the abstract if we don't use field data, which is to sum up hours of use (HOU) per mode times wattage for both the measure and baseline cases, and subtract the measure usage from the baseline usage.

Yeshpal Gupta—Will savings vary by building type? There will be different HOU by building type and number of TVs.

Steven Long—Savings will be per unit, we have no plans to differentiate by occupants or building type. DEER interactive effects is the only piece that differs by building type. Different sectors may have different average family sizes?

Sherry Hu—I have a question about program. Will it be a statewide program? There are different climate zones, but they shouldn't affect the UES.

Steven Long—Not beyond the interactive effects.

Annette Beitel—I see two outcomes: approval to move to workpaper development, or form a subcommittee. Let us know if you are interested in being on a subcommittee within the next week (5 business days). Subcommittees will meet via teleconference or webinar. The subcommittee will work through the issues and come up with proposal by September. The subcommittee will be facilitated, probably by Jenny.

Ron Ishii—Will the subcommittee be looking at data and answering questions?

Annette Beitel—Subcommittees will be measure-specific. Members will help refine the abstract enough so there is enough information to move forward. Subcommittee work doesn't involve data gathering. The subcommittee will be peer reviewers, and not expected to perform analysis.

Steve Galanter—The subcommittee will take open issues, such as calculations vs. statistical studies and come up with justification for their decision. The subcommittee expertise will give that direction.

Doug Mahone—I have a bigger TF question. We have limited time and resources, and need consistency across subcommittees for measures. It will need to evolve.

Annette Beitel—We want to reduce complexity and cost.

Pierre Landry—Do NW RTF guidelines provide answers to Doug's questions?

Ron Ishii—To answer the question of what's good enough?

Pierre Landry—A subcommittee could come up with reasonable estimates to bring back to the table.

Annette Beitel—We might need a subcommittee to decide what level of detail is needed to come up with reasonable estimates.

Ahmad Ganji—Would utility people be involved? Like the person who developed it? How about manufacturers and implementers in this case?

Annette Beitel—If you have a suggestion of and organization to invite, we can reach out to someone (like Comcast).

- Decision: This will go to a subcommittee to discuss details of the abstract and proposed workpaper, including: preferred data sources such as an NRDC/Ecova study, info from a STB life-cycle assessment study done by a consultant referred by Brandon Tinianov, or additional logging performed by SCE; savings estimation methodology based on service-provider specific STB settings, operational mode usage/consumption or logged load profiles, and behavioral factors; measure cost; and effective useful life based on either service provider feedback, life-cycle assessment data, or other sources.

V. Abstract 2: Tier 2 Advanced Power Strips—SDG&E
Martin Vu, RMS, Presenter

Doug Mahone—Any user feedback on how useful these things are?

Martin Vu—Residential feedback has been positive. The CalPlug simulator is not enough – we need to go into homes to see what is actually happening.

Martin Vu—This measure should probably be direct install (DI) and have someone install for customer so they do it correctly.

Steven Long—I may be jumping ahead. Is all of this the same? No. What are the proportion of power modes? Will that get picked up in the study?

Martin Vu—The power strip is smart enough to pick up on it based on load sensors.

Steven Long—My experience is that it's not.

Martin Vu—I'll put down suggestions to see if Nate in ET can consider.

Steven Long—Looking at percentage of plug load, it's about 5% of home usage.

George Roemer—Isn't it higher since there's sometimes 2?

Martin Vu—Are they in agreement on the baseline? The average home has: DVR, STB, etc. If we can agree on the baseline, it may change savings values significantly

Ahmad Ganji—We will need statistical surveys on this. Nobody would know unless surveyed. Why is this replace on burnout (ROB)?

Martin Vu—My explanation for this is that nobody replaces power strips until they're broken. Therefore ROB is probably more appropriate.

Group—That sounds more like retrofit add on, because they would be replacing non-smart strips.

Martin Vu—Good point. If you take Tier 1 in consideration, there is still compelling savings potential even if Tier 1 is considered as part of the baseline.

Martin Vu—There is a baseline technology mix assumed based on what CalPlug did. For home entertainment or both. Cal Plug was home entertainment, not home office. We might need two measures.

Armen Saiyan—You might need to combine to both, since you wouldn't know which one it was when rebated. How long is the baseline assumption good for based on advancements in electronics?

Annette Beitel—How does the NW RTF handle changing baselines?

Tom Eckhart—We recognize some technologies are longer term than others. We put in a checklist to go back and review measures so the measure parameters are not established indefinitely.

Annette Beitel—Yes. Like with the NW RTF measures, each measure could have a "sunset" date when it needs to be reviewed again by Cal TF.

Martin Vu—Retrofit add-on is fair game.

Steven Long—For a power strip giveaway, have a weighted baseline.

Armen Saiyan—Same on direct install (DI), installers may not keep track well of where strips are installed.

Martin Vu—Utilities have kits, maybe this is part of the kit as consideration. If we targeted 5% of customers, what would portfolio impact look like? It would rise to level of at least 1% of portfolio savings. The heart of the issue is, what is a reasonable baseline? We won't have statistical sampling until we bring it into field, but efforts are being commissioned. SDG&E is doing some pilots.

Bryan Warren—Do you have any comments on cost?

Martin Vu—One manufacturer who is part of the pilot indicated that direct install (DI) with equipment and labor cost is about $50/powerstrip. I haven't run the E3 cost-effectiveness numbers yet.

Bing Tso—What are your markets?

Martin Vu—As far as I know, there are two: commercial and educational facilities.

Yeshpal Gupta—The studies I've read have office space in community colleges.

Annette Beitel—Maybe it's more generalizable then…

Jon McHugh—For commercial spaces, Title 24 has requirements for plug load control, which could present base case issues. Also, some people may act differently in their home versus what is done in a lab. Behavioral issues may affect the baseline. For example, some people might be motivated to turn off loads. Potentially less things are plugged into the primary strip –an Xbox might be on a different TV and not the main TV. Same with the home office. You might need 2 or 3 of strips to actually get the savings you're considering from the baseline plug load assumptions. Energy Solutions did a plug load control study for residences. The standing losses (wattage) of the of the plug load controls were potentially greater than the energy savings resulting from turning off circuits of devices that are in standby mode. Thus potentially resulting in a net increased energy consumption. By measuring, you could ideally identify what percentage of savings is eaten into by smart plug standby power.

David Pruitt—Considering the present long-term viability of putting the strip in residences, in a multifamily scenario, if renters are moving in and out, that could affect savings – they may not use it for a period of time, may move furniture/devices. Is it portable?

Pierre Landry—Things that get plugged in get replaced and upgraded. Need some measure of usage over the life of the power strip.

Martin Vu—Expiration date comes into play at some point.

Pierre Landry—Has anyone besides Cal Plug done research? LBNL was doing plug load research at some point, anything on usage?

Martin Vu—Yes, I know there was work in Australia, but we need something local.

Brandon Tinianov—LBNL has some current work on that.

Doug Mahone—In terms of the cost effectiveness, one good sanity check is to run a test to see at least how much it needs to save for the measure to make sense.

Martin Vu—The advanced power strip has a logging mechanism. If not tampered with, did this device save/log what it was after?

Dylan Sullivan—Making use of the log mode, could you randomly assign some customers to log mode and other to on mode? You could get the delta energy usage that way. Use experimental design to address baseline issues.

Pierre Landry—Who accesses data from the logger?

Spencer Lipp—I don't think all of them have log mode capabilities. I have a relationship with Embertec through the utilities as disclosure so wanted to limit my comments in this conversation, but I don't think all of them have log mode capabilities. You need to be careful about what triggers T24 code in commercial buildings. Just putting them in would not trigger a plug load control requirement.

Jon Proctor—We have 8 studies on this, can't we decide that that is enough to decide on a baseline?

Group—General agreement.

John Proctor—I would say, I know the baseline.

Armen Saiyan—The baseline might not be completely true/representative in certain cases.

John Proctor—One can always come up with a case that isn't true. There are baselines proposed in Cal Plug. Why not use that number?

Martin Vu—8 studies is a decent sample. Are we okay with how we arrived these numbers? We may need to look at the data more closely.

John Proctor—We don't want to make it impossible to get to where we want to go. If there is already info, that's good. We can always use more info, I love data, but we may not need more.

Annette Beitel—I want to underscore Jon's point. The expertise of this group could enable us to make simplifying assumptions in lieu of collecting more data. Can we see if we can make a decision on preliminary baseline and then update when we get the data from the field?

Martin Vu—I agree, we should cut it off at some point. My concern is that IOUs may run with assumed numbers today, and it could get re-calibrated downstream. TVs are an extreme example. Numbers can be so scattered that if you promote the measure, you could overpay, and sliding scale of savings makes it not cost-effective.

Steven Long—I have an opposite viewpoint, although I conceptually agree. The magnitude of savings in the studies may be of concern. It may be good to move forward, but there is a concern that the data may not be applicable for this particular application (such as being out of state, including or excluding Xbox, etc.).

Sherry Hu—I agree with John. How much more data should need to be collected for new measure workpaper development? In my experience, during WP development, more data is often sought before the WP is approved. Even if we have done lots of studies, Commission staff wants more field data prior to approving a workpaper. The IOUs are program implementers, not a research institute. There is enough data already. The program design has a lot of feedback already. Also, bear in mind that the EM&V process includes a feedback loop that can and should be used to refine ex ante values.

Annette Beitel - Great comments.

Ron Ishii—This all gets back to risk management, which I think is a procedural issue this group needs to grapple with soon. Maybe it's not measure-by-measure.

Annette Beitel—To that point, we will be forming a crosscutting subcommittee to consider the issue of amount of data needed for abstracts and WP approval.

- ACT: Form crosscutting subcommittee to consider level of data needed for abstract/WP approval by Cal TF.

Tom Eckhart—I'm on board with John Proctor's comment. In this case, timing is a big issue. There has been an issue of slow workpapers in the CA process. I've been challenged by my association to give higher priority to clean, well-thought out, high potential things. The things requiring wild assumptions should be lower priority.

Jon Proctor—To reiterate what Doug said, if the savings are half of what the studies say they are, then I still think it's good enough to keep it in market.

Annette Beitel—Is there enough info right now to move forward with existing data, using a reasonable estimate derived from the 8 studies that have already been conducted? Will a reasonable, conservative estimate produce a cost-effective measure? Alternatively, the group may also decide we don't have enough info specific to CA, and need to wait for additional 2 studies because the existing data and studies do not allow for a reasonable estimate of data for California. Issues:

1. Cost effectiveness: Will measure be cost-effective even if conservative estimates of baseline are used?
2. Is there enough data from the existing 8 baseline studies to determine a reasonable baseline estimate, or is more data needed?
3. When will SDG&E's study be ready that will provide additional data?

Martin Vu—The studies will be ready at the end of the year, staggered.

Steven Long – You are saying one option is to go forward with what we have?

Annette Beitel—Make simplifying assumptions with what we have.

Steve Galanter—To John Proctor's point, working back from a TRC of 1, what value of UES produces that value? If we use 3 or 4 factors of safety with this data, then the group can make decision. If the savings are so small can't justify, then throw it out.

Annette Beitel—We have two courses of action: pass these issues to a subcommittee to decide on the data and make simplifying assumptions, or hold off for the data to come back at the end of the year.

- Decision: This will go to a subcommittee to consider make simplifying assumptions vs. obtaining more data for logging; look at data sources including CalPlug, an LBNL plug load study, and an Energy Solutions study, UES methodology options such as estimated device consumption and hours of use vs. a logged load profile; baseline scenarios for plugged in devices including baseline expiration options; behavioral impacts on savings; measure permutation options; variations by service provider that should be accounted for; and measure cost and effective useful life approaches.

Abstract 3: LED Menu Boards—SCE
Steven Long, SCE, Presenter

Jon McHugh—Caution – take a look at what the wattages are of those backlit signs. The history behind the 12 W/ft^2 code is based on two paths to code compliance (T8 with electronic ballast or 12 W/ft^2), due to an issue with federal preemption. Specifying the technology created a preemption issue and the 12W/ft^2 option was meant to prevent a preemption challenge.

Steven Long—12 is the code baseline, the actual assumption for savings aren't based upon code.

David Pruitt—Assuming the boards don't need to be switched out, just the lights?

Steven Long—Good question.

Pierre Landry—There are different dates on the chart and in the trial document: 2013 vs early next year.

Steven Long—I will go back and double check. I think that Aug 2014 is the completion date.

John Proctor—Do we know how long people are leaving the boards on? Asking people is iffy. If they have the hours the place is open, then that would be the minimum. You could use that for baseline.

Steven Long—They are also doing logging, but you are right, that would give us the bare minimum.

John Proctor—The assumption is that they will all be better than T24 to begin with?

Steven Long—I would agree.

Annette Beitel—We will not move forward with the workpaper since data is still being collected that will be ready in August. Do you want feedback from group on the pilot?

Steven Long—Anything that needs to influence the pilot? Want to confirm the completion date, and that it is logging.

Pierre Landry—The research plan says they are doing data logging. Can we get a copy of the research plan?

Steven Long—It's included in the abstract.

Pierre Landry—It looks out of date.

Brandon Tinianov—Is the pilot study described in the appendix?

Pierre Landry—Will the data be available in 2014 or 2015?

Steven Long—It may not be as soon as we think. We need an up-to-date research plan. I'm not familiar with the details of the pilot research plan.

Yeshpal Gupta—Some places have 24/7 operating hours. We need to calculate an average, or calculate the UES for different store types?

Steven Long—I don't know if the measure will be broken out by different operating hours / store types. I should clarify.

Pierre Landry—Wouldn't savings be a function of area of sign?

Steven Long—Hours of use (HOU) will change by building type.

Ahmad Ganji—You should make sure it's not already an updated sign – that would be an outlier.

Steven Long—We're targeting existing facilities. Will not do something with new boards.

Ahmad Ganji—There's the possibility that it has already been updated to LED.

Steven Long—I assume they're picking sites with fluorescent menu boards.

Martin Vu—Is this replace on burnout (ROB)?

Steven Long—It'll be fairly general – retrofit, replace on burnout, and new construction (RET, ROB, NEW).

Yeshpal Gupta—Is it better to use code than the existing fixture for ROB?

Steven Long—On the custom side, we are asked to use a progressive baseline that's not 12 but 6.7. We're not using that on the deemed side b/c we don't necessarily know on average. New construction brings up questions.

Spencer Lipp—On page 2, there is a conservative savings of 40%.

Steven Long—I don't know exactly if that is efficacy or wattage reduction.

Mary Matteson-Bryan—The pilot description on page 1 describes a study completed in 2009 that showed 70% savings but didn't apply to SCE, so 40% is conservative.

Tom Eckhart—Extrapolation seemed sketchy. Has an E3 TRC been run on a range of assumptions as a sanity test?

Steven Long—SCE has an idea management process to review new measures, look at market potential savings, and potential cost effectiveness. I don't know if we've run through E3, but it's a good suggestion.

Annette Beitel—We could add a section for TRC results and minimum threshold savings for cost effective measures to the abstract.

- ACT: Incorporate initial TRC into Abstract Template.

Jon Proctor—Another process improvement would be better citation (page numbers).

- ACT: Include page numbers in Abstract Template citations.

Annette Beitel—On this one we will not be doing a subcommittee. Obviously there are some more pieces of information that Steve needs to get back to the group.

- Decision: SCE needs to research timing and design of pilot, and will follow up with a Subcommittee.

Abstract 4: LED Recessed Suspended or Surface-Mounted Panels—PG&E
Grant Brohard, PG&E, Presenter

Pierre Landry—It's a waste of time to determine the baseline mix if Title 24 is not triggered, EM&V will figure it out. For anything other than early retirement, use Title 24.

Pierre Landry—Why is California behind on lighting installations?

Tom Eckhart—We're not too far below, we're just at the bottom of the list.

George Roemer—In the Midwest there has been a lot of activity with LEDs, including at huge industrial facilities.

Tom Eckhart—There is also the issue of high saturation reducing general cost effectiveness

Jon McHugh—For this proposal, are you guys looking to shape the market in terms of quality, flicker, etc., other than just wattage so that we don't leave people with a bad taste in their mouths?

Grant Brohard—Yes, for that very reason we will only incent panels that are in the lighting consortium.

Pierre Landry—I have a question about the DEER NTG. Does that make sense in this case?

Grant Brohard—Yes- the NTG depends on how long the product has been in the market place. The benefit of the doubt is given for new measures, not an existing one. We'll use the current NTG.

Pierre Landry—Is it less than 1?

Grant Brohard—Yes.

Grant Brohard—We don't have good data on fixture pricing so I would appreciate input on that.

David Pruitt—Replace on burnout (ROB) – is the baseline to replace a fluorescent with a similar fluoresce?

Grant Brohard—The retrofit kit is to go from fluoresce to LED, or a completely new fixture. You use the technology type of the measure you're installing.

Yeshpal Gupta—What is cost of the new lamp? What is the cost of a lamp and ballast, T8?

Grant Brohard—Does the group think that incremental cost should be from a T8 to an LED? You can meet code with a T8.

Group—Yes

David Pruitt—What is burning out in the replace on burnout case? The lamp, ballast, whole fixture?

Grant Brohard—The retrofit kit must take out the ballast or fixture – then it's more expensive. For a full panel, it's a full retrofit.

Katie Wu—The DEER measure cost study was just finalized and it may cover this.

Grant Brohard—We'll look at it.

John Proctor—It would be helpful to put numbers in the abstract. Your confidence level of high means you're really sure that number will get accepted. But if you put the number in there you're going to use, at least we can say something about it.

Grant Brohard—Okay.

Armen Saiyan—How will you determine the baseline for lighting power density?

Grant Brohard—Two potential ways:

- What was already used for Title 24, which already builds in all the variables.
- Proposed method two, which would take more work, model an 8 by 10 room using 5-10 typical ballasts.

Jon McHugh—Do you mean a room, or just an 8 by 10 space?

Grant Brohard—Yes, just a space.

Steven Long—Are you using different building weights?

Grant Brohard—We will weight by building type to get one number.

Steven Long—That could get complicated.

Jon McHugh—What are the benefits of the proposal?

1. Higher efficacy of light source
2. Higher optical efficiency of the luminaire

Does it make sense to look at what is commonly sold by lumens or W/lumens, and determine the equivalent LED W/lumen. You're not gaming the system, you're using equivalent lumens LED Watts. This is beyond what room it's in. You achieve a lower LPD, with potential spacing further apart. Break it down to luminaire level.

Grant Brohard—A luminaire replacement program, this is what they're going for with the program. We could break down by fixture by building type.

Jon McHugh—Getting away from LPD, you're looking at Watts for same delivered lumens

Mary Matteson Bryan— They're using the LPD methodology to come up with the wattages required for baseline luminaires that meet the LPD. I think this methodology just uses LPD to estimate wattage by fixture type.

Grant Brohard—Yes.

Mary Matteson-Bryan—Design of the LED luminaire determines the efficacy, and luminaires can deliver the same lighting performance but have different wattages. Customer A could put in a 40 W panel, and B could put in a 38W panel. You won't actually capture that, would you?

Grant Brohard—No, we would simplify.

Mary Matteson-Bryan—Then you need to go through the modeling process with the LED to determine an average wattage replacement.

Grant Brohard—You still need to meet lumens for task, but need to meet the wattage for LPD requirements.

Jon McHugh—This could be simplified, don't look at LPD unless giving incentives on a square footage basis. For fixture by fixture, use a lumen comparison. Lumen efficacy is different for LEDs and fluorescents.

Mary Matteson-Bryan—This could be problematic – if you want to measure the lumens delivered on a surface, you can do better with LEDs. You can't necessarily match the lumens of the fixture.

Tom Eckhart—The lumens/W rating is changing with LEDs.

Brandon Tinianov—So is cost/fixture.

Spencer Lipp—With LPD, we are going roundabout for right answer. Jon McHugh's suggestions is good for replace on burnout (ROB) and new construction (NC).

Jon McHugh—The baseline is a fixture's luminous efficacy that is the basis of comparison. For a given lumen level out of a baseline fluorescent, you compare to an LED that is providing same lumens, and determine the Wattage difference.

Grant Brohard—The way I read it, for a space type, different lumens are needed and you don't care about fixtures. You care about total wattage in the space, however you want, however you reach it. What is the minimum wattage of a T8 with the right number of units and meets the LPD specified by code. Then you do same for the LED for that space type. But then you have to do it for all spaces.

Jon McHugh—Only for a square foot basis.

Grant Brohard—For fixture by fixture, you might not meet LPD otherwise.

Jon McHugh—For a space type with low illuminence requirement, you can space farther apart, or put in a lamp with low ballast factor. Compare what would be an appropriate base case lamp (for that spacing or ballast factor) to an LED with the same light output for that fluorescent case.

Sherry Hu—I like Jon's proposal, it is simpler than what is proposed in the abstract. It's a 1:1 replacement where you care about certain lumens in space. You can compare common wattages for 2x4 or 1x4 fixtures.

Grant Brohard—But the code also changed the number of lumens per workstation. The code changed the number of lumens for an activity, so you could risk over-lighting and getting too high of a LPD.

Spencer Lipp—What do people do? When it burns out, you replace light for light. What's out there is probably better than the LPD for T24. You will still be okay.

Grant Brohard—But we don't know, they may not be able to do that under the new code.

George Roemer—I'm leaning towards 1:1. It's tough to use code for the baseline. Everything in the space will be better than code. The designer will choose one fixture, and use it everywhere.

Tom Eckhart—It's elegant and simple. If lumens/watt are changing, and fixtures are expensive, some people would delay replacing that fixture.

George Roemer—The base is, what would a customer do without the program. They would put in a T8, so what is the LED equivalent.

Tom Eckhart—Yes, but I think the timing of replacement may also be affected by the product on the market.

John Proctor—Isn't that a factor of market penetration, and not savings?

Brandon Tinianov—And also of cost of capital. I will also point out that there are some rooms where, even purely for aesthetic reason, one-to-one won't be the case.

George Roemer—What would you do without the program?

Grant Brohard—Get a T8, but stick to an existing fixture.

Steven Long—This leads to a discussion on redesign, so this becomes 1:1 in the program.

Grant Brohard—What I'm hearing is we want to simplify it and make it one-to-one? Let's simplify. We'll make it 1:1, stick to using lumen equivalents, and have a small lighting subcommittee.

Grant Brohard—On 1:1 for 2nd generation T8's as the base case, does that meet code?

Jon McHugh—If it doesn't meet code, illuminence values change slowly. Technology in last 4 code cycles changed fast. Your base case is what you were going to do with the space (low ballast factor luminaire in an existing fixture…use the LED equivalent).

Mary Matteson Bryan—So the question is, would the CPUC support such a baseline?

Jon McHugh—It's not that it's not meeting code – I'm just looking at the luminaire. Someone could meet code by putting in a new ballast factor fluorescent lamp. As long as it meets code in lumens, then you're doing the same thing.

Mary Matteson-Bryan—What if it's still too bright?

Jon McHugh—You would have to re-space, still comparing luminaire to luminaire.

Sherry Hu—For new construction (NC) and early retirement (ER) situations - 1:1 works for ER. For NC, I propose checking with T24 and use T24 as the baseline. You could use two different methods for 2 different baselines.

Armen Saiyan—You need to consider controls if what's in there would exceed code, and build it into the baseline, unless it's within the code.

George Roemer—This may be a good question for a single teleconference subcommittee, the subcommittee could look at the 2 baseline options.

Grant Brohard—We could do that, and distribute to small group.

Jon McHugh—The base case is a dimmable ballast when code is triggered.

- Decision: This will go to a subcommittee to discuss details of the UES methodology for two different baselines (early retirement and new construction), measure cost from the new DEER cost study or manufacturer surveys, and effective useful life (EUL) approaches.

Abstract 5: Commercial Condensing Unit Heaters (Warehouses)—SCG

Chan Paek, SCG, Presenter

One of the things we need to figure out is how to incorporate other building types into the savings calculations.

Because of the small market potential, this is going to be a very low impact measure, so, back to the risk management discussion of earlier, we don't have to be as accurate with the savings estimate.

Yeshpal Gupta—Are you thinking of having separate savings by building type?

Chan Paek —This is a small savings measure, and we were not planning on differentiating savings by building type..

Yeshpal Gupta—There is such a difference in savings between building types.

Chan Paek—Each building type could be the subject of discussion

Annette Beitel—What are the attributes of different studies?

Chan Paek—How they estimated savings.

Yeshpal Gupta—Did the studies look at different climate zones?

Chan Paek—I didn't read in detail to find out.

John Proctor—The assumed amount of heating load hours is 50% different.

Steven Long—The assumptions on building design which affect load, do the CEUS vintages of buildings affect the building assumptions?

Chan Paek—The model is preliminary, we plan to refine it. Don't know if will differentiate b/w vintages

George Roemer—If a building is thermally sound, fewer unit heaters are needed.

Steven Long—Are you making the assumption that you are meeting the unit heater thermostat set point? Unit heaters are running/fired off, regardless of set point. You might have different load capacity if meeting the set point.

Chan Paek—Lots of models run by DEER don't account for that situation.

George Roemer—Two comments on the abstract algorithm – first, the heating algorithm was fixed in the last year for the Midwest TRM, all TRMs seem to have had the same error. The other issue is sizing, as unit heaters are notoriously oversized. Warehouse interior space are probably not too bad. The algorithm doesn't have sizing factor. Sizing is imprecise for designers. I recommend a load factor in the algorithm. You can run an eQuest model for sizing, but the designer will pick something larger and will make assumptions such as ventilation and no internal loads that contribute to oversizing. Including an oversizing factor makes sense. The TRM error was fixed so that unit heater consumption = capacity x hours. I will pass some things on to Chan. The TRMs address the algorithms differently.

Chan Paek—eQuest determines heating demand, and you put in design size, and eQuest will model based on that.

George Roemer—eQuest won't tell you what the designer specifies though.

Chan Paek—I didn't put it in the abstract document, but I'm thinking about converting the base unit to kBtuh.

George Roemer—That simplifies.

Chan Paek —I will convert to savings per kBtuh.

George Roemer—77% is a common load factor and 30% oversizing will help.

John Proctor —I have a question – there are different ways to estimate savings.

1. CEUS savings
2. Taking other CEUS numbers and running thru eQuest

Why would you believe eQuest values (R values, etc.) would be better than 1 or 2 things from CEUS?

Chan Paek—eQuest is the preferred method. That is what Commission staff use for DEER.

John Proctor—Is that more accurate, or does that approach just go through the process easier?

Chan Paek—Perhaps both?

Group—Latter – the process is easier.

John Proctor—It's not defensible to take measured data, and add into a model with other numbers. How is that better than the measured data in the first place?

Chan Paek – I think the savings calculation is perfectly fine. We used eQuest to see if would get same level of savings. We also checked the DEER measure for high efficiency furnaces for storage buildings – 80% - 90% efficiency yielded 1.4 therms/1000 sqft. We want to offer rebates to all customers that might be interested in using. We don't have all values that go into eQuest model, but some are more important than others. Electric load converting to heat inside building is big issue. Some assumptions will be changed.

Jon Proctor—I don't see that it's defensible to take measured data and say that a model with very many assumptions like eQuest is any more accurate.

Yeshpal Gupta—Does DEER have warehouses as a building type?

Chan Paek—There is a refrigerated warehouse, but of course that is inappropriate for this use.

Yeshpal Gupta—There is a typical greenhouse model that you can use. Condensing unit efficiency is hardly ever realized.

David Pruitt—Does eQuest have a curve to adjust efficiency?

Chan Paek—For implementing program/rebate, need to set a certain efficiency bar

Yeshpal Gupta—Target a realistic efficiency and not ideal.

Chan Paek —We will go with labeled equipment efficiency value.

Yeshpal Gupta—There is a paper on condensing units.

Group—This is not a boiler.

Steven Long—The cycling issue is a good question. On some measures, you need to deal with dynamics.

Ahmad Ganji—This is a heater. Not a boiler. Boiler efficiency will vary based on feed water temperature. The manufacturer's certified value for a unit heater will not vary much.

Steven Long—Should there be criteria for when it's important or not (such as HVAC) where it is sensitive?

Ahmad Ganji—For a boiler, it is. The return water temperature will determine boiler efficiency.

Yeshpal Gupta—Is there flue gas that must condense completely?

Chan Paek—Not complete condensation. Partial condensation.

George Roemer —There is standard information on the nameplates.

Jon Proctor—The worry about the numbers not being right is decreased because there is no ducts system to screw it up. I think in this particular case you don't have to degrade it.

Annette Beitel—Is the group comfortable with not applying a degradation factor to efficiency?

Group—Yes

Pierre Landry—What have MN and IL done about this?

Larry Kotewa—Illinois filed its 3rd TRM update and used the gas savings from the Nicor Gas plan.

George Roemer—The TRMs have heating equation with corrections that would fix the issue with abstract equation.

Pierre Landry—And is there uptake based on those numbers?

Larry Kotewa—Yes, it's a very popular program.

George Roemer —There's lots of unit heaters, but it's tough to get traction because the designer specifies the heater. How do you get the owner the specified efficient one because the designer is the one who specifies?

Pierre Landry —This sounds like a midstream program.

Jon McHugh—Given the high infiltration rates in warehouses, have you looked at tubular radiant heaters? If driving by infiltration load you may be better off not trying to heat all of the air in volume.

Chan Paek—Radiant heaters are tough based on how they're rated for efficiency.

George Roemer—There is also a good application for infrared/tubular, so maybe this is something we look at next?

Chan Paek—But as I showed earlier, there is already a very small market potential.

John Proctor—I have a suggestion on the 3 EUL values – stick with one. If you divide the total number of units / number of units sold per year, you get a 20 year life. It's a mature market.

Jon McHugh—New construction is 2% or less on square foot basis, so looking at mature market is reasonable.

Chan Paek—The data for the 20 year EUL is from 1991 – 1995

George Roemer—I would use a 15 year life.

Annette Beitel—George can you describe the oversizing factor?

George Roemer—For oversizing, I'm not aware of data to support. Some codes require oversizing. 30% is one idea to toss out.

Annette Beitel—In terms of deciding whether to go to subcommittee or not, we need to know if you (Chan) agree with the forum's recommendations.

Chan Paek—I will try that adjustment on the eQuest model. I will also look at the Illinois TRM.

George Roemer –Both Minnesota and Illinois resolved the oversizing factor. Everyone uses 30% oversizing, 77% load factor.

George Roemer—Adjust for efficiency change to ensure heat is being provided for maximum and typical cases.

Brandon Tinianov—Is it relevant/appropriate to apply oversizing factors used in Illinois or Minnesota to Southern California? Is it 30%? Designers will be more cautious in colder climates.

Armen Saiyan—As a designer, I have seen people oversize for no reason.

George Roemer—I have seen no other data on typical oversizing.

Pierre Landry—For the oversizing factor, you could call 12 field designers and get a feel for it.

George Roemer—Designers look at coldest design day, assume ventilation, no internal load, no interactive effects – it's not exactly a straight percentage.

Scott Fable—Have you pulled a typical unit size from CEUS? Or another source? The source probably already captured oversizing in its measured data. The source numbers are for heating per square foot, so the equipment would have been oversized already.

Armen Saiyan—Customers will change like for like most likely.

Chan Paek—For DEER, you put in max heating demand and use as a design specification. Something bigger might be needed for max peak load. The usage profile will only require 80 – 85% of heater usage. The efficiency of the heater varies depending on the input rating. There is a drop in efficiency depending on firing rate.

Sherry Hu—It might not be big different for equipment oversizing, depends on equip performance curve. Try a few runs.

David Pruitt—eQuest has performance curves for furnaces.

John Proctor— But not for unit heaters.

Chan Paek—Full firing must meet 80%, and must be at 74% for the minimum firing rate.

Jon McHugh—If using existing data, it will be conservative because LPDs are dropping, there are less internal gains, and higher heating loads. There are more controls. All of these things lead to higher heating loads. Using pre-existing is conservative. I suggest just use the billing data. Does DEER give you what you need?

Chan Paek—There are multiple ways to manipulate the data. There are so many inputs, but only a few measure parameters

Doug Mahone—I would like to echo Jon's earlier point about the modeling. I'm thinking of all sorts of leaky building, doors open, and I don't imagine the model captures that.

Jon Proctor—Somebody I know used to say that if you're going to make a bunch of assumptions and build it into a model, then you might as well just go ahead and assume the answer. If we have real survey data, why don't we just use that? I would much rather use data from a survey instead of a model with a bunch of information that isn't necessarily better than what's in the field, even if it's weak.

David Pruitt—But you can extrapolate to other climate zones using a model.

Ron Ishii—CEUS is made with model data, and they are extrapolating climate data.

Pierre Landry—It's probably not worth modeling.

Chan Paek—Simple analysis method?

Pierre Landry—You need to look at cost effectiveness. How many people will do it?

Annette Beitel—So to summarize the TF recommends that Chan calculate UES using an engineering model, and not an eQuest model.

Chan Paek—The DEER EUL for high efficiency furnaces is 20 yrs. I'm inclined to use 20 years.

Jon McHugh—What does ASHRAE use?

Larry Kotewa—For a standard unit heater, they're probably right. They're not complicated devices.

Group—Can you include something that accounts for disposing of device so it's not dumped?

Annette Beitel—We did not resolve the EUL issue.

Steven Long—All of the data points towards 20 years?

George Roemer—15 years from studies.

Pierre Landry—I like sales data that produces 20 year EUL.

Group assent for 20 year EUL.

Annette Beitel—Does the incremental measure cost include extra labor and disposing of condensate?

Chan Paek—Yes, we will look at that labor cost.

George Roemer—Will you also look at correcting the algorithm per my earlier suggestion? (No dividing by efficiency, since it is input)

Steven Long—Is the approach in the abstract or in the TRM recommended?

Ahmad Ganji—Heater efficiency should not be there.

John Proctor—Change in annual hours, there are less hours with higher efficiency.

Bing Tso—The only different factor will be operating hours.

Chan Paek—I don't remember other building types in CEUS. Can we just go with warehouse building type, and not worry about other types?

Ahmad Ganji—These heaters are in open spaces. There's lots of infiltration. They are continuously on. Consider this.

Pierre Landry—In an open warehouse, there's the most infiltration. Amongst other building types, warehouse is worst case scenario.

John Proctor—If it's cold, the unit heater will be on all day in a warehouse and it doesn't matter what the efficiency is. A greenhouse is the best case, because you want temp control, and you use the thermostats. Something other than a warehouse is better for calculating. In a warehouse, efficiency is irrelevant, and you may not save anything.

Spencer Lipp—In manufacturing, the "control" is someone flips a switch.

Doug Mahone—Should the program distinguish between open sheds (no temperature control or comfort conditions) vs. closed condition where thermostat is effective? For open, you just pick the number of operating hours.

Pierre Landry—Yes, what I'm hearing is that we want the administrator to require that clients have closed facilities with some type of control, like a simple thermostat.

Chan Paek—We could put those requirements on application form, though they're difficult to enforce.

Steven Long—Wouldn't savings be conservative without control?

Larry Kotewa—A customer would have to downsize, for same output.

Doug Mahone—That's not how they sell the unit.

Spencer Lipp—Add a control and save more.

Annette Beitel—To finalize, use a simplified approach, and control for oversizing?

John Proctor—It's not worth it in this particular case.

Annette Beitel—So we're not adjusting for oversizing?

Peter Miller—Not here, because CEUS already accounts for it.

Group—Don't include oversizing.

- Decision: The abstract will proceed to workpaper development. The workpaper should:
  - Not incorporate an over sizing factor,
  - Use engineering calculations and existing data without eQuest modeling,
  - Address two building types: open space with no temperature control and closed space with basic temperature control.
  - Utilize a 20 year EUL

Closing

Annette Beitel—We need to schedule the rest of the meetings for the one-year cycle. Is the fourth Thursday of the month good for a standing meeting? Please let us know quickly if you have a major conflict with that. Because of Thanksgiving, we will have the November meeting on the third Thursday of the month.

- Decision: Regular meetings will be on the fourth Thursday of every month, except for November, which will be on the third Thursday. No meetings will be held on August or December.

Annette Beitel—The RFQ said that TF members from out of town would only be required to attend the first meeting in person. However, the PAC feels that TF meeting would be much more productive if the majority of the group were present in the room for at least 3- 4 meetings this first year. I know that this is a little bit of a bait and switch, but I will be following up individually with those of you from outside the Bay Area to figure out the best arrangements to maximize your travel.

- ACT: Annette will follow up individually with members who must travel to attend meetings in person.

Annette Beitel—For the July meeting, we will rely again on the IOUs to provide the Forum with work to review. These abstracts will likely include a measure involving the smart thermostat. However, we hope to begin reviewing ideas submitted by you at the September meeting.

- ACT: TF members will be asked to submit New Measure recommendations and other 2015 Cal TF work plan suggestions starting with the September meeting.

Peter Miller—In closing, thank you very much again for coming and for being so engaged in the discussion throughout the day. It was clear at the CPUC's En Banc meeting earlier this week that the Cal TF is very much on policy maker's radars. I have faith that this group will be able to maximize the benefits from all of this positive awareness.


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