



**California Technical Forum (Cal TF)  
Technical Forum (TF) Meeting #9  
April 23<sup>rd</sup>, 2015  
Pacific Energy Center  
851 Howard St  
San Francisco, CA**

**I. Participants**

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

Doug Mahone, TF Member  
Tom Eckhart, TF Member  
Mary Matteson Bryan, TF Member  
Armen Saiyan, TF Member  
Pierre Landry, TF Member  
Spencer Lipp, TF Member  
Sherry Hu, TF Member  
George Hernandez, TF Member  
Jon Proctor, TF Member  
David Springer, TF Member  
Bryan Warren, TF Member  
Steven Long, TF Member  
Ahmad Ganji, TF Member  
Jon McHugh, TF Member  
Dylan Sullivan, TF Member  
Brandon Tinnianov, TF Member

Grant Brohard, Pacific Gas & Electric (PG&E)  
Jia Huang, PG&E  
Oriana Tiell, PG&E  
Ed Reynoso, San Diego Gas & Electric (SDG&E)  
Alfredo Gutierrez, Southern California Edison (SCE), Presenter  
Mike Messner, Energy Platforms  
Jon Lanning, TrickleStar

**On the Phone**

George Roemer, TF Member  
Larry Kotewa, TF Member



Martin Vu, TF Member  
Bing Tso, TF Member  
David Pruitt, TF Member  
Bruce Harley, TF Member

Sean Ong, EMI Consulting  
Miguel Urrea, Southern California Gas (SCG)  
Martha Garcia, SCG  
Michele Friedrich, Sacramento Municipal Utility District (SMUD)  
Eli Caudill, Conservation Services Group, Observer  
Larry Tabizon, SCE  
Derek Okada, SCE  
Julie Colvin, PG&E  
Andy Fessel, PG&E  
George Otero  
Amanda Stevens  
Harvey Bringas

## **II. Key Decisions and Action Items**

### **Ex Ante Value Development: Current Practice – Future Vision**

- ACT: Alejandra to send Cal TF Staff Comments on Phase II Workshop I to full TF.
- ACT: Develop case for why DEER cannot be “fixed” and must be replaced.
- ACT: Include in subcommittee plan the “Business Case” for alternatives to DEER.
- ACT: Subcommittee should consider how it would approach development of a statewide TRM if there were no DEER and no EnergyPlus.
- ACT: Subcommittee should clearly identify what is primary objective/purpose of DEER in the subcommittee plan.
- ACT: Form subcommittee to explore DEER alternatives.
  - Show cost savings from proposed alternatives
  - Consider starting from scratch, not trying to fix status quo
  - Timeliness of process needs to be addressed
  - Alternative must involve a stable updating process
  - Look outside of California for best practices
  - Focus on structure and process rather than modeling tools
- ACT: Subcommittee summary to be approved in May for subcommittee launch in June.
- ACT: Subcommittee to make actionable recommendation by November.



### Statewide Measure List Update

- ACT: Cal TF staff to work on adding links to workpapers.

### Clothes Washer Recycling Research Plan Questions to Support Workpaper

- ACT: Separate interactive effects by utility
- ACT: Separate kW savings by climate zone
- Workpaper granted interim approval contingent on agreement to research and document whether program does shrink secondary market of used clothes washers.

### Set Top Boxes Workpaper

- ACT: Focus on PAC test and create range of TRC results using off the shelf equipment as lower bound.
- ACT: Data gathering strategy should differentiate between service providers.
  - This is contingent on verifying that the settings are truly different
- ACT: Considering requiring that retired boxes be turned into implementer.
- ACT: Consider reaching out to independent installers for cost information.
- ACT: Alfredo to follow up with George Hernandez about cost information
- ACT: Consider using usage from larger SDG&E study (N=700) to establish baseline.
- ACT: Find distribution of different types of boxes

### Circulating Block Heaters Workpaper Update

- ACT: Alfredo to make a short presentation once Edison data is finalized
- ACT: Presentation to include statewide market size/potential

## **III. Ex Ante Value Development: Current Practice – Future Vision**

Annette Beitel, Cal TF Facilitator—

### PowerPoint Presentation

Jon Proctor—On the guiding principles you have identified, does the Commission really agree that the process should reflect them?



Annette Beitel—I think the Commissioners would agree. The guiding principles came straight from Alejandra’s review of all pertinent Commission orders in the last 15 years. This is Commission language.

Pierre Landry—I think the real question is whether the guiding principles are actually being reflected on the ground.

Tom Eckhart—Yes, I would agree from practicing in both California and the Northwest that there isn’t a significant difference in the number of measures between the two regions.

Doug Mahone—I wouldn’t say that the small number of measures in DEER is surprising. I find it to be a very hopeful finding. It means that we can actually tackle the challenges.

Steven Long—Did we ever track down where the 8% number came from?

Annette Beitel—We are still tracking down the exact origin of that number. It came from Staff originally and we believe that it is a percentage of the entire portfolio.

Jon McHugh—What does the 70% overlap figure mean?

Jenny Roecks—It means that 70% of IOU workpapers pull some data or methodologies from DEER.

Bing Tso—Why does the slide quote the percentage of values used by PG&E? What are the other IOUs doing?

Grant Brohard—That is just an example. All IOUs are required to use DEER methods.

Steven Long—To your point about complexity, I would say that a lot of it doesn’t come as much from the actual measures but the delivery mechanisms. Delivery has a big impact on savings.

Jon McHugh—What do you mean by that?

Steven Long—Net to gross certainly has an impact, but measure type, like ROB vs. Early Replacement, really changes the savings calculations.



John Proctor—And trying to assign single point savings estimates to each imaginable iteration increases complexity without actually increasing accuracy—since measures have an inherent range of savings potentials depending on the actual “client.”

Doug Mahone—I see from your slide that DEER no longer has cost information. Why did they remove all IMCs?

Jenny Roecks—The DEER team believed the values were outdated.

Doug Mahone—So, what do PAs use now?

Mary Matteson Bryan—It is incumbent on the PAs to study IMC for each new measure.

Jon Proctor—Can we get a copy of the comments you submitted to the Commission?

Annette Beitel—Of course.

- ACT: Alejandra to send Cal TF Staff Comments on Phase II Workshop I to full TF.

Steven Long—Have you included the Uniform Methods Project (UMP)?

Annette Beitel—We have looked at UMP for alternatives and talked to DOE about using those, but they focus largely on ex post methods, not ex ante deemed value development.

Spencer Lipp—In a sense, wouldn't DEER documentation be the best available information for some measures? You wouldn't want to just throw it all out.

Tom Eckhart—You would hope so, but so much of it is virtually impossible to track down.

Pierre Landry—If I were on the receiving side of this proposal, I would argue that the solution isn't to throw it out, just fix it. I think you also need to develop an argument to support why it can't just be fixed. The current process and team is too broken to “fix it.” There is good information there that should be salvaged, but it cannot be done through the existing process.



- ACT: Develop case for why DEER cannot be “fixed” and must be replaced.

Steven Long—I tend to agree with Pierre, since I believe DEER is also being used for load forecasting and other non-CPUC statewide processes.

Furthermore, the advantage of the modeling approach is that you can systematically scale values. The problem is that it is being applied to measures that can’t be modeled.

Annette Beitel—Are you saying that the current database can be fixed?

Steven Long—In my mind there are three options: Create a new TRM, fix DEER, or replace it with another database.

George Hernandez—I’ve been involved with modeling since the very beginning, and I’m sure we’ve all heard that “all models are wrong, some are helpful.” I would insist that that trying to fix the current DEER is like trying to polish a failed concept. The solution we all need to be driving towards is data-driven analytics.

Grant Brohard—I’ve also been involved with DEER for decades, and this is the first time I’ve seen an opportunity for stakeholder input. Judge Edmister pointedly asked if we should just get rid of DEER, and, even if not everyone on Staff agrees, there are a significant number of them that do. I think we need to seize the opportunity.

Doug Mahone—I think we need to think about limiting our scope by focusing on just one set of values in DEER. For instance, unit energy savings over IMCs, etc.

Annette Beitel— I agree that with Doug that we can’t build Rome in a day. So, after the group decides whether you want to launch a subcommittee, we need to have a discussion about limiting that subcommittee’s scope.

Group—Agreement to form subcommittee to explore alternatives to DEER.

- ACT: Form subcommittee to explore DEER alternatives.

Annette Beitel—The next question is what the scope of the subcommittee should be. Should it be process and structure alternative to DEER? Should it be questions about modeling software?



Martin Vu—I would recommend that you look at the RFP that was issued for the 2013 DEER update.

Annette Beitel—I agree but I also think we shouldn't limit ourselves to that right now. The Commission wants us to be thinking big, and we should seize that opportunity.

Martin Vu—In that case I would also recommend that you show the business case/cost savings that could come from the suggested alternatives.

- ACT: Include in subcommittee plan the “Business Case” for alternatives to DEER.

George Hernandez—I would like the subcommittee to take a fresh look at the whole problem—assume there is no DEER, there is no Energy Plus, and ultimately show the ideal scenario.

- ACT: Subcommittee should consider how it would approach development of a statewide TRM if there were no DEER and no EnergyPlus.

Mary Matteson Bryan—The timeliness of an alternative process is a huge priority, because that is one of the biggest problems with the current process.

Sherry Hu—I think we need to look outside of California to find the actual best practices.

Ahmed Ganji—I think the subcommittee needs to start by settling what the primary objective or purpose of DEER is in order to then evaluate how the alternatives compare.

- ACT: Subcommittee should clearly identify what is primary objective/purpose of DEER in the subcommittee plan.

Steven Long—I agree that nailing down the objectives—forecasting, planning, etc.—is key. I would also look at what the best approaches would be.

Annette Beitel—We need to parse out what goes into the measure complexity subcommittee, what goes into the POU TRM/DEER Documentation subcommittee, and what issues are for this new subcommittee.

Dylan Sullivan—In terms of the business case, it would be great to quantify the value of the time spent by all parties wrangling with DEER.



- ACT: Include in business case time that parties spend on DEER.

Armen Saiyan—Regardless of the alternative we propose, we need to have a reliable system for updating.

- ACT: “DEER Alternatives” subcommittee plan should include plan for updating DEER.

Pierre Landry—I agree with Steven that DEER used to be good for what it was originally intended to do. However, it has been saddled with a plethora of other functions. Maybe DEER will still be one of the many tools in our tool kit that will just be used for more limited purposes.

Jon McHugh—I wouldn’t recommend going down the path of evaluating the different models available. I think the subcommittee’s time would be much better spent on the actual process.

Jon Proctor—I agree. Putting the tools aside, the current process is bleeding ratepayers dry by making the process very slow and resource-intensive.

Doug Mahone—I also agree with John that the tools used aren’t the real question. The problem to me is that the assumptions being used aren’t being systematically documented.

David Springer—And establishing how the models will be calibrated is also hugely important.

George Hernandez—I would caution the group about going down the model calibration route. That can also be a hugely expensive rabbit hole. I’d recommend that we look at different, more data-based approaches.

Bryan Warren—I agree with Sherry that the IPMVP can be a good process model for us. Even if the protocols are for ex post, we can borrow key principles.

- ACT: Form subcommittee to explore DEER alternatives.
  - Show cost savings from proposed alternatives
  - Settle on objectives for current DEER, use those to evaluate proposed alternatives
  - Consider starting from scratch, not trying to fix status quo
  - Timeliness of process needs to be addressed
  - Alternative must involve a stable updating process





- Look outside of California for best practices
- Focus on structure and process rather than modeling tools

Annette Beitel—Thank you all very much for all of your feedback. This is clearly a very important issue for all. I will take all of your feedback, draft a subcommittee plan that you can comment on again in May, and then we would like to launch the subcommittee in June. The hope is to have an actionable recommendation in November.

- ACT: Subcommittee summary to be approved in May for subcommittee launch in June.
- ACT: Subcommittee to make actionable recommendation by November.

#### **IV. Statewide Measure List Update**

Jenny Roecks, Cal TF Staff—

##### **Walkthrough of Spreadsheets on Website**

Jon McHugh—Does the spreadsheet offer a way to look at DEER values used in workpapers?

Jenny Roecks—Yes, but you have to look through the actual workpapers to determine exactly what values/methods were referenced.

Armen Saiyan—I think this is a really helpful tool. A great next step would be if we could have links to the actual workpapers.

Jenny Roecks—Yes, of course. That is something we will be working on in the next few months. I have some concerns about version control, since workpapers are constantly being updated. However at the very least we will have a version of the workpaper, and then the reader would have to contact the developer to track down the latest updates.

Steven Long—Yes, to Jenny's concerns about version control, we do have multiple versions of each workpaper, and many of those are or were effective at different times of implementation.

- ACT: Cal TF staff to work on adding links to workpapers.

#### **V. Below Code Subcommittee Update**



Alejandra Mejia, Cal TF Staff—

PowerPoint Presentation

Jon McHugh—Is your code compliance box applying to new buildings?

Alejandra Mejia—It applies to instances where code has already been triggered.

Jon McHugh—I would think that most code noncompliance buildings are a subset of existing buildings. Is noncompliance supposed to be fitting under existing buildings?

Annette Beitel—If you look at code noncompliance, permitted buildings is new construction in which permits will be required. If you have a building that got the permit, are the savings associated with that permitted building actually realized? Even if you have a permit and followed the design specs, you may still not have realized the savings that were expected. This is what the first box is describing.

Jon McHugh—Don't studies show that permitted buildings are saving more energy than was predicted by code?

Annette Beitel—That is just from one recent study. Compliance estimates vary fairly widely across most studies.

Non-permitted buildings should probably say non-permitted end uses. Often times permits are not pulled if the upgrade is for a measure rather than an entire building. So the question there is, if they are not pulling the permit, are you getting the code savings or not? If they don't pull a permit, they may still get higher efficiency.

George Hernandez—How do you have a new construction building with non-permitted stuff inside?

Alejandra Mejia—It may be permitted, but not performing as expected.

George—I don't see anything about energy savings in the boxes. The building code does not require energy performance. Are you speaking about energy codes?

Alejandra Mejia—Yes, specifically Title 24 Building Energy Standards.



Bruce Harley—We've found on the east coast that if everyone installs code minimum, you get higher efficiency overall. However, there is still a lot of non-compliance. While this is residential, it shows that not all code is enforced the same but even when code is followed, the energy performance is different than expected.

John Proctor—I think there is a lot of opportunity in the non-permitted buildings box, since I've heard a large percentage of roof top units are not permitted.

Alejandra Mejia—Yes, that seems to be what the smaller, less robust studies indicate too. However, the problem is that there is very little data on the actual performance of the non-permitted equipment.

Annette Beitel—However, it sounds like Proctor Engineering has some data, so we will follow up with you on opportunities to continue characterizing this box.

- ACT: Alejandra to follow up with John Proctor about performance of non-permitted units.

Steven Long—Most of this implies T24 building energy code, but in your example for thermostats you were implying T20 energy code. In the residential sector, non-compliant appliances seem to get installed.

Annette Beitel—We need to look into this more.

Doug Mahone—The thing about all three of those green boxes is that you could provide solid arguments to support IOU incentive programs to target the opportunities they describe. Part of that argument is that the CPUC wrongly assumes all measure get replaced at the end of the EUL, which is capped at 20 years, at which point replace on burnout must be assumed.

Steven Long—These measures imply that something has to be done. You're either fixing/repairing something or doing an elective action. Related to the third category, measures whose sole purpose is energy efficiency do not need to be fixed/put in if they fail.

Alejandra Mejia—Do those additions trigger code?

Steven Long—Code is triggered for new construction or if you're doing a host measure, but in the residential thermostat example, code is not triggered.

Armen Saiyan—It's like controls. By code you have to employ energy savings



strategies, but not replacing equipment doesn't trigger code if you just want to employ controls.

Sherry Hu—For example, I have a demand control ventilation measure which is required for a new building. For now we are using existing buildings as a baseline since it is a retrofit add-on measure, otherwise there are no savings.

Alejandra Mejia—Those examples all seem to fit in the categories we've already identified. Are we missing any categories?

Jon McHugh—For lighting retrofits, since code is now triggered at replacing 40 fixtures, contractors are only replacing 39 fixtures to not trigger code. If code is triggered, the full cost of controls must be covered. The light fixture combined with controls makes the total cost very high without an incentive. Some people feel that they are unable to get the deep level of savings and it encourages unintended code triggering.

Alejandra Mejia—Those are exactly the type of savings opportunities we're going after. We are treating that particular example as a repair indefinitely measure.

Doug Mahone—A lot of the energy code requirements revolve around tenant improvement scenarios. The programs are going after people who wouldn't have done anything anyway, so the need to isolate intent is because you need a rule set to distinguish between those two types of customers. The lost opportunity is those people who weren't going to do anything, and we need to identify them.

Steven Long—Part of the challenge is that there is not only an issue of double counting, but also a gap between what is assumed to be installed in forecasting measure and what is assumed by code. There is an assumption about the adoption of codes in the future. What we are trying to identify is the actual adoption of code and the gap that develops. The assumption in how to claim incentive program savings is that the code becomes standard practice. You might want to think about this.

Alejandra Mejia—Yes. Other forums are looking at the double counting between code and forecasting. We are keeping tabs on the progress in those forums but are focusing on the opportunities because that's where we think we can create the most value.

Doug Mahone—My understanding of forecasting is that for existing building lighting retrofits, the potential study assumes a 5% per year turnover rate within the existing building stock. I don't think anybody can actually say whether this



kind of lighting retrofits (where customer is encouraged to change something) is part of that 5%. Our assertion is that these customers wouldn't have done a retrofit anyway, and probably weren't part of the forecasting, but there is still a lot of uncertainty around that.

Spencer Lipp—We often run into projects that triggered code at some point in the past, but didn't fully comply. The code baseline makes those projects even less cost effective.

Alejandra Mejia—Thanks for all of this feedback. I will take it back to the subcommittee as we continue our work.

## **VI. Clothes Washer Recycling Research Plan Questions to Support Workpaper**

Ben Chou, NRDC—

### **PowerPoint Presentation**

Tom Eckhart—How are you going to determine what fraction of washers go out of California?

Ben Chou—Our approach mirrors that of similar evaluations for recycling programs. It will use market actor interviews to make that determination.

Jon Proctor—My question is more about the size of the market. How do we know that you can remove enough to actually affect the price of the remaining goods?

Pierre Landry—There is a possibility that the shrunken secondary market starts pulling from less efficient machines that would have otherwise been scrapped.

Doug Mahone—Or the opposite could happen: the least efficient machines get scrapped via the program and the efficiency of the secondary market actually increases.

Armen Saiyan—These are things that we won't know until we start implementing the program.

Dylan Sullivan—Is there anything we can learn about this market from the more traditional appliance recycling programs?



Ben Chou—Yes, the research plan I’m proposing today is heavily informed by evaluations of those programs.

Doug Mahone—So presumably the units being resold by JACO were the best, most efficient ones.

Ben Chou—Exactly.

Doug Mahone—What is the water savings in terms of a percentage of the use of older units?

Ben Chou—If I’m recalling correctly, it is roughly 50%.

Bryan Warren—And what is your baseline?

Ben Chou—The baseline in a 2008 non-ENERGY STAR usage.

Annette Beitel—The question for the group right now is if you are comfortable approving the workpaper contingent on the implementing a research plan to document the impacts on the secondary market.

Steven Long—Is there an entity already interested in implementing the measure?

Ben Chou—Yes, we’ve been discussing it with PG&E, SCG, and LADWP. We would pursue those conversations further upon TF approval.

Steven Long—I would recommend that the interactive effects be parsed out by utility territory and kW savings by climate zone.

- ACT: Separate interactive effects by utility
- ACT: Separate kW savings by climate zone

Pierre Landry—One of my concerns is that we don’t know enough about the market to understand how to impact it.

Annette Beitel—And that has been the concern from the very beginning. However, I don’t see how to answer that question absent of implementing the program and doing the research through implementation.

Armen Saiyan—I agree that we can approve the calculations, and the risk will be on the implementers.



Spencer Lipp—But then we are getting more into program design. The technical calculations are clearly right. The rest depends on the program design, but we aren't approving the program design.

Armen Saiyan—That's more of a process question for us. One option is to approve it for test purposes.

Sherry Hu—From Ben's presentation, his research is enough to convince me that there is a strong possibility that the measure would be successful. In light of the current drought I think we need to trust the technical calculations and initial market research and approve the workpaper.

Annette Beitel—Again, the request is that we approve the workpaper contingent on savings being verified ex post.

Brandon Tinianov—It just seems like we are trying to create language around managing all of the risk. There is inherent risk in all of this, and I wouldn't want whatever language we come up with to get in the way of implementing a good measure.

Pierre Landry—And I'll agree that the drought does make this a very valuable measure.

Annette Beitel—Now that we've had the discussion, is the TF comfortable awarding interim approval to this workpaper contingent on ex post savings verification?

Group—Yes.

- Workpaper granted interim approval contingent on agreement to research and document whether program does shrink secondary market of used clothes washers.

## **VII. Set Top Boxes Workpaper**

Alfredo Gutierrez, SCE—

*[The objective of this agenda item is no longer workpaper approval]*

Oriana Tiell—Do you have any idea of how many boxes are in your territory?

Larry Tabizon—The number will be in the tens of thousands.



George Hernandez—I may have some cost information. I just need to figure out how I can share it with you.

- ACT: Alfredo to follow up with George Hernandez about cost information

Larry Tabizon—We were able to capture data on the equipment we were replacing during the trial. What we found was that the majority of the boxes were on “always on” status.

George Hernandez—I think there are three things for you to consider: The switch from analog to digital; difference in power consumption between standard and DVR; and the system architecture is really changing now.

Oriana Tiell—On the smart power strips trial, do you have the data from the larger, 700 household sample?

Alfredo Gutierrez—I do have that data, but we only have 25 sites where the set top boxes were monitored individually.

Oriana Tiell—You can still use the larger sample to establish the baseline.

- ACT: Consider using usage from larger SDG&E study (N=700) to establish baseline.

George Hernandez—Is this measure only for one type of providers?

Alfredo Gutierrez—Right now it is just for satellite boxes.

George Hernandez—In that case, are you including the power consumption for the routers and long-haul modems that are often used by satellite systems?

Alfredo Gutierrez—Not to my knowledge.

Oriana Tiell—Do we know the distribution of boxes by type?

Alfredo Gutierrez—We do not have that right now, but we can get it.

- ACT: Find distribution of different types of boxes

Dylan Sullivan—Have you looked for cost information in the ENERGY STAR docket?





Larry Tabizon—All of the cost information we have found so far is for new customers, and we are crafting this as an early replacement measure.

Armen Saiyan—Have you tried to leverage your intention to give the distributors a midstream incentive to get them to give you cost information?

Alfredo Gutierrez and Oriana Tiell—It has been very difficult to get them to give us any data whatsoever. This is slowly changing, but even when they do give us data, we are not allowed to share it, which makes it impossible to use for the workpaper.

Doug Mahone—I think there is a work around for this measure cost issue. The only reason you need the cost is for calculating the TRC. I would suggest that you concentrate on the PAC test and then do some sensitivity testing around the TRC.

Alfredo Gutierrez—We have begun to do that: Some of the measures are around 4; others are closer to 1.

Annette Beitel—It seems like the group is recommending that such an approach, supplemented by any additional data from George and Dylan, would be enough for us to approve that portion of the workpaper.

- ACT: Focus on PAC test and create range of TRC results using off the shelf equipment as lower bound.

Sherry Hu—I would also suggest that I'd be happy with the results from a Delphi panel.

Spencer Lipp—I think the cost of the new measures can be your lower bound for the sensitivity approach (sensitivity analysis for TRC modeling)

Dylan Sullivan—I'm hearing from our electronics people that the incremental cost is mostly software.

Larry Tabizon—The issue is not so much about the hardware design, it's about the connectivity.

Steven Long—Do you mean they have to do upgrades to the box *and* to their systems?



Larry Tabizon—It's about how to fit the equipment into their systems. It's the hardware, software, and network infrastructure.

Martin Vu—Do you have any information about what the manufacturers do with the retired boxes?

Alfredo Gutierrez—It varies. Some get refurbished, some get sent out of state, and others get scrapped.

Doug Mahone—I think this measure presents us with an opportunity to learn about the difference between service providers.

Annette Beitel—So it seems like the recommendation is to differentiate between service providers.

- ACT: Data gathering strategy should differentiate between service providers.
  - This is contingent on verifying that the settings are truly different

Armen Saiyan—Back to the question about secondary markets, it seems like the midstream delivery gives you control over that.

Larry Tabizon—Yes, that is part of what we're hoping to do, but the service providers are refusing to describe what 'recycling' means.

Pierre Landry—You can require that the boxes be turned into the implementer.

- ACT: Considering requiring that retired boxes be turned into implementer.

George Hernandez—You can also probably get much better cost information from the independent installers.

- ACT: Consider reaching out to independent installers for cost information.

## **VIII. Circulating Block Heaters Workpaper Update**

Alfredo Gutierrez, SCE—

### **PowerPoint Presentation**

Doug Mahone—So what is the problem if the heater is undersized?



Alfredo Gutierrez—It will be constantly on to maintain the required temperature and will use more annual energy.

Ahmad Ganji—Do you know if the Bonneville Power Agency (BPA) samples had working controllers?

Alfredo Gutierrez—We don't know that information about the BPA data, but will be tracking it as we proceed to implementation.

Tom Eckhart—Did you perform a weather sensitivity analysis on the BPA data?

Alfredo Gutierrez—Yes, and the change was less than one percent.

George Hernandez—So what I understand is that you are replacing the undersized units with a different type of heater that uses even less energy.

Alfredo Gutierrez—Yes.

Ahmad Ganji—I think you will find that in some southern California ambient temperatures these won't even be needed.

This is a very good measure. It will be very interesting to see how the implementation goes.

- ACT: Alfredo to make a short presentation once Edison data is finalized
- ACT: Presentation to include statewide market size