Agenda & Notes

California Technical Forum (Cal TF)

Meeting #38: Technical Forum (TF)

March 22, 2018

9:30 am – 3:30 pm

La Kretz Innovation Center at
525 South Hewitt Street, Los Angeles, CA.

Time	Agenda Item	Discussion Leader(s)
9:30 – 9:40	**Opening**	Annette Beitel, Cal TF Staff
9:40 – 9:45	**Measure Consolidation Update**	Tim Melloch, Cal TF Staff
9:45 – 10:15	**TF Member Survey Findings** • Summary of findings (anonymous) • Recommended changes or action items **ACT:** Cal TF Member feedback/recommendations based on Survey Monkey	Jennifer Barnes, Cal TF Staff
10:15 – 10:45	**Miscellaneous Measures** • Review new information since "Tier 1" presentation • Review notable issues **ACT:** Cal TF Affirmation of Consolidated Measures	Roger Baker, Cal TF Staff
10:45 – 11:00	**Break**	
11:00 – 11:30	**Agricultural/Pumps** • Review new information since "Tier 1" presentation • Review notable issues **ACT:** Cal TF Affirmation of Consolidated Measures	Ayad Al-Shaikh, Cal TF Staff
11:30 – 12:15	**Lighting Measures** • **"**Tier 1" Subcommittee Report-Out	Tim Melloch

	ACT: Cal TF Questions; Identify Issues for Subcommittee to address prior to "Tier 2" Affirmation	
12:15 – 12:45	**Lunch** Small Group Discussions (for interested members): 1. Further discussion on Survey Monkey results/process recommendations 2. Measure consolidation 3. EM&V RFP vis a vi the Cal TF	Jennifer Barnes Tim Melloch Annette Beitel
12:45 – 2:00	**Water Heating Measures** • Review new information since "Tier 1" presentation • Review notable issues **ACT:** Cal TF Affirmation of Consolidated Measures	Ayad Al-Shaikh
2:00 – 2:15	**Break**	
2:15 – 3:15	**Water Heating Measures, continued**	Ayad Al-Shaikh
3:15 – 3:30	**Close** • Recap agreements & action items	Annette Beitel

Meeting Materials

- Presentation: TF Member Survey Results & Recommendations
- Presentation: Lighting Measures "Tier 1" Report-Out
- Presentation: Ag/Pump Measures
  - Ag/Pump Measures Affirmation Slide
- Presentation: Water Heating Measures
  - Water Heating Measures Affirmation Slide
- Presentation: Miscellaneous Measures
  - Miscellaneous Measures Affirmation Slide

I. Attendees

	In-Person	*Via Telephone*
Cal TF Staff	Annette Beitel Ayad Al-Shaikh Roger Baker Jennifer Barnes Tim Melloch	
Cal TF Members	Pierre Landry Landry & Associates Lawrence Kotewa Elevate Energy Greg Barker Energy Solutions Armen Saiyen LADWP Chris Rogers CleaResult Larry Brackney NREL Spencer Lipp Lockheed Martin Sepi Shahinfard Cadmus Chan Paek So Cal Gas Ed Reynoso SDG&E Mike Casey Onsite Energy Mehdi Shafaghi LADWP	Gary Fernstrom PG&E (retired) Bing Tso SBW Doug Mahone TRC Energy Services (retired) George Beeler AIM Associates Lisa Gartland Proctor Engineering Mark Modera UC Davis Mary Matteson Bryan Yeshpal Gupta Lincus Owen Howlett SMUD
Non-TF Attendees	Bob Ramirez DNV GL Jay Madden SCE Jia Huang PG&E	

I. Key Decisions and Action Items

Miscellaneous Measures

- The Cal TF affirmed the following miscellaneous measure
  - 11.02 Home Energy Checkup.

- Action Items:
  - Consider subcommittee or Cal TF meeting on opportunities for new deemed measures.

Agriculture/Irrigation Measures

- The Cal TF affirmed the following agriculture/irrigation measures:
  - 3.02 Agricultural Ventilation Fans
  - 3.05 VFD on Agricultural Well Pumps

- Action Items:
  - For 3.05 VFD on Well Pumps, Cal TF staff to confirm whether or not savings associated with the distribution system is included in the measure.

Lighting Measures

- Action Items:
  - Cal TF staff to check to see if the recent disposition missed one of the measures.
  - Consider Cal TF subcommittee to assess new opportunities for deemed measures.

Water Heating Measure

- The Cal TF affirmed the following water heating measures:
  - 6.02 Faucet Aerators, Residential
  - 6.03 Low-Flow Showerheads, Residential
  - 6.04 TSV with and without an Integrated Low-Flow Showerhead
  - 6.05 Laminar Flow Restrictor
  - 6.07 Boiler, Commercial
  - 6.08 Tankless, Commercial
  - 6.09 Storage Water Heater, Commercial
  - 6.10 Boiler, Process
  - 6.11 Direct Contact Water Heater, Process
  - 6.12 Boiler, Multi-Family
  - 6.13 Central Storage Water Heater, MF
  - 6.14 Storage Water Heater, Residential

- 6.15 Tankless, Residential
- 6.16 Heat Pump Water Heater
- 6.18 Demand Control for Centralized Water Heater Recirculation Pump
- 6.19 DHW Boiler Reset Controller, MF
- 6.21 Hot Water Line Insulation
- 6.22 Tank Insulation
- 6.23 Faucet Aerators, Commercial

- Action Items:
  - For 6.18 MF DHW Pump Control, Cal TF staff to see if there's anything that takes it above code.

II. Notes

Regulatory Update
Presenter: Annette Beitel

EM&V RFP
We have reviewed the CPUC's EM&V RFP and it is what we expected it to be.

There is some encouraging language in it:
1. They aren't going to prefer DOE2.2/MAS Control. The RFP doesn't put the finger on the scale for DOE2.2/MAS Control but rather it says that it will let the evaluation contractor select what they want to use.
2. The RFP is being used to select new ex ante contractor for deemed measures.

Regulatory Strategy
Most critical items for regulatory requests in 2018:
1. Regulatory approval of eTRM as the database of record. It's clear that the only entity that can make that decision is the Commission, not staff or an ALJ.

2. Secure regulatory approval of streamlined data spec.

3. Regulatory approval of the consolidated measures.

These are our core regulatory goals for 2018. What's the approach for doing this?

Motion to the ALJ seeking to approval to consider these issues in Phase 3.

Phase 1 is the eTRM database with the measures uploaded, but it won't have any work flow features.
File the eTRM with measures on January 15th and conduct the training for users.
We want to have a joint CPUC/CEC workshop comparing the features/opportunities/challenges of continuing with DEER versus switching to eTRM.

Larry Brackney: What's missing is engagement with the new EM&V contractor and engagement with folks developing proposals.

Annette Beitel: We'll engage with whoever is selected.

Consolidated Measures
A lot of discussion with the IOUs on how to get them approved. Would like to not start the process until September.

Steven Long: Isn't September a CPUC bus stop?

Annette Beitel: These are phase 2 not phase 1 measures. There is written guidance from the CPUC and it looks like these qualify as phase 2 to us so they could be submitted on a rolling basis.

Transition Plan
We'll need your help developing a transition plan. What are the downstream effects and how do we make it happen. We'll sketch out a framework but we don't have visibility into your organizations. That's a piece that needs to be filled in.

Pierre Landry: Who is going to represent DEER if the current ex ante team isn't on the new EM&V team?

Annette Beitel: I don't know. Maybe CPUC staff? We envision that the workshop is not going to be about building simulation results, it will be about usability and look and feel. We are preserving, not changing, underlying building simulation.

Pierre Landry: What if the new EM&V contractor develops a DEER alternative?

Annette Beitel: Only the Commission can approve a new database of record. It will also be cheaper for a firm to approve measures in the eTRM than in DEER since they are clearer and better documented. All measures have to have a work paper – you can't pull from DEER directly and you have to go through the work paper process. We'll have all of the consolidated measures in the eTRM so you can pull directly from there.

Larry Brackney: There has to be a plan for a trajectory through the 3-year cycle.

Annette Beitel: The EM&V contractor can use any building simulation software.

Measure Consolidation Update
Presenter: Tim Melloch

Armen Saiyan: Do those numbers include the consolidation that we already did?

Tim Melloch: It does. We're still unclear on the number of HVAC measures too.

Jay Madden: We were asked if a lot of lighting measures have disappeared. Are there other measures we want to consider? Haven't had time to think about it, but we need to talk to see if we can come up with 7 or 8.

ACT: Consider subcommittee or Cal TF meeting on opportunities for new deemed measures.

Tim Melloch: In my presentation, you'll see how much savings comes from lighting so not sure how that's going to be made up.

Pierre Landry: We've been talking about what we're going to do after lighting for years. Do we need to get these savings from lighting? What's the next CFL? Is there recognition that there isn't a new technology on the horizon?

Gary Fernstrom: LED efficacy is running 100 lumens per watt but it could be 160 lumens per watt. Control technologies (variable speed lighting) have good potential. These two things could allow us to have lighting technologies but the regulatory climate doesn't support it.

Greg Barker: There is recognition that you don't get the same benefit from efficacy changes. The control opportunity includes scaling the system down and not just controlling it.

Larry Brackney: T24 requirements around daylighting is also squeezing out savings.

Member Survey Summary
Presenter: Jennifer Barnes

Pierre Landry:

- [Regarding feedback to have more engagement with the CPUC] Once the new EM&V contract is out, we would like more engagement from the new EM&V contractor.
- The dashboard is a great idea.
- Create a boiler plate page with acronyms and put it in the back of all presentations.

Miscellaneous Measures
Presenter: Roger Baker

Armen Saiyan: Is this the measure that's the behavior program?
Roger Baker: No that's the Home Energy Report. This is the Home Energy Audit/Checkup.

Chan Paek: We haven't started the work paper development work but are hoping to include the mail-in survey as part of the measure.

11.02 Home Energy Checkup Affirmation
Roger Baker: Does the Cal TF affirm the subcommittee recommendations regarding Stage 1 issues for miscellaneous measure 11.02, Home Energy Checkup?

- No one in the room or on the phone objected.

Agriculture Measures Ayad Al-Shaikh

3.02 Agricultural Ventilation Fans

Pierre Landry: Is this a midstream or downstream measure?

Ayad Al-Shaikh: Today it's downstream. The intent is for PG&E in the future is to include midstream.

Armen Saiyen: What is the reasoning for the larger option?
Ayad Al-Shaikh: The test only covers 48" and below. You want to include fan width in the VFD so you can include more savings.

Ed Reynoso: Not a governing body that sets standard.

Armen Saiyen: Is there a standard minimum efficiency covered by T24?

Ayad Al-Shaikh: No standard. Industry standard practice is to be above the average of the population that's been tested.

Ed Reynoso: Is there a standard temperature for these things?
Ayad Al-Shaikh: If they get too hot, milk production goes down. You need to keep your cows comfortable. You could look at this measure from a milk production standpoint as well.

Mark Modera: We have been running a project for the CEC to look at cooling cows efficiently. Can get you that information.

Ed Reynoso: Is it air only?

Mark Modera: Typically have the fans and sprayers that spray on the livestock so they are effectively an evaporative cooler. There were some mats but those were too expensive. Spraying evaporatively cooled air over the cows is a lot less water but maybe more energy.

Pierre Landry: Mark is talking about changing the measure not changing the savings for this measure.

Annette Beitel: We definitely want to capture the ways to change the measure.

Armen Saiyen: Is this like fuel switching since you are using more water but less energy?

3.05 VFD on Well Pumps

Ayad Al-Shaikh: Any savings differences are from rounding; we're using what's in the work papers.

Ayad Al-Shaikh: We have data from pump tests going back to 1995. Will try to understand what the host equipment is and what the EUL is.

Greg Barker: It could be the life of the well. Like lighting where the 1/3 rule doesn't make sense.

Annette Beitel: What is the EUL? When you look at the data, what will the EUL likely be?

Ayad Al-Shaikh: Limit is 20 years.

Gary Fernstrom: Variable speed benefit depends on the system being served not on the water being out of the ground. It's worth looking into this a little deeper. If it's pumping into a pressurized system, then the VFD benefit is less valuable. You get better benefit pumping into a pressurized system than into an open system. But you should look at the water distribution system not just the well.
The measure should have some criteria in it addressing the type of water distribution system that the VFD is serving and capture the savings associated with the distribution system and not just form drawing the water out of the ground. You'd get more savings.

Annette Beitel: This is a good stage 2 issue.

Ayad Al-Shaikh: Think it may be captured already but it's worth checking.

Greg Barker: Does the enhanced offering include DR controls?

Ayad Shaikh: Don't know what the DR application is.

Agricultural Measure Affirmation
Ayad Al-Shaikh: Does the Cal TF affirm the agriculture subcommittee recommendations regarding Stage 1 issues for agricultural/irrigation measures?

- No one on the phone or in the room opposed the affirmation.

<u>Lighting</u>
Presenter: Tim Melloch

Ed Reynoso: I think the recent lighting disposition missed one of the measures.
Tim Melloch: We'll look into it.

EAR team changes the baseline to 25% CFL and 75% LED

Cal TF member: Is this an early replacement measure?

Tim Melloch: No, ROB.

Mike Casey: Which is more favorable baseline?

Tim Melloch: Old one. Had a higher % of CFLs so it benefited you.

Mike Casey: Is that restricting what is sold or manufactured?

Greg Barker: What is sold but in respect to their manufacture date.

Armen Saiyen: Is the assumption that there are a bunch of junk LEDs out there?

Annette Beitel: What is their evidence that that is the baseline? Where are they getting that? Manufacturer data?

Tim Melloch: It talks about trends in market but there is no analysis to support it.

Larry Brackney: Those show up in the prototype.

Greg Barker: The response from EAR is that they seem to be looking at trends in NEMA shipment data and projecting it out. They've ignored what we'd one in the analysis which showed a huge stock of CFLs.

Gary Fernstrom: We keep bumping up against policy. Lamps have to meet the standard if they are manufactured after the compliance date, but lamps manufactured before that date can be sold until stocks are exhausted. EAR team tends to apply the rules as they become effective even though there is stock left to be sold. We wouldn't see this in effect in terms of existing stock.

Tim Melloch: They say that after stock is exhausted this is what you'll see.

Gary Fernstrom: There is a huge inventory of existing stock.

Spencer Lipp: When there was a similar regulation around T12s, the utilities eliminated them from their programs. PG&E did a study that found that there are still T12s out there and available. There is a real delay.

Armen Saiyen: Can we make the case to say that the utility programs are accelerating the replacement?

Greg Barker: T20 wouldn't make any distinction between CFL and LED so where do they come up with this split?

Tim Melloch: In the disposition, if you look at price of LEDs that are competitive with CFL they argue that no customer would buy one. But not based on a thorough analysis.

Armen Saiyen: Would there be a case for de-lamping coupled with the replacement since you get more output?

Annette Beitel: De-lamping isn't equivalent service.

Larry Brackney: Not de-lamping but daylight. You're not reducing lumens in the space and you aren't using any energy.

Gary Fernstrom: Trying to focus on what we're able to do about it. Observation that what you are doing is a lot less on an absolute basis. That's unavoidable across all measures.

Small diameter direction lamps were part of the disposition.

No MR16s through programs.

Greg Barker: It's a stock issue.

Gary Fernstrom: It's anybody's guess.

Greg Barker: The real unknown is how manufacturers prepare for this. If they are paying attention, they could be bringing in truckloads to sell in California.

Armen Saiyen: This was an eventuality. We're seeing an end of an era because the opportunity for lighting is being squeezed.

Annette Beitel: June PAC meeting will be a summary on measure consolidation. IOUs know this but it might be nice in May meeting to have break outs on what are the ways to resuscitate deemed measures. Or how to find new savings.

ACT: As above, consider Cal TF subcommittee to assess new opportunities for deemed measures.

Armen Saiyen: Maybe strategy might change that not everything has to go to deemed. Maybe Cal TF is a clearing house for methodologies in general.

Gary Fernstrom: Believe compliance with CEC regulation is going to be low because of compatibility issues. Will be a lot of customers looking outside the state to buy halogens to keep their systems running well. CEC thinks standard is 100% effective.

Steven Long: DOE is backing off on enforcement of many things as a formal policy. Has there been any discussion on how this impacts baselines?

Annette Beitel: That's an excellent stage 2 issue.

Steven Long: Maybe the CEC is enforcing them if the Feds are?

Armen Saiyen: No, they rely on the local governments to enforce.

Steven Long: There is HVAC and T20 compliance. Think they do little stings on the T20.

Armen Saiyen: T20 is requirement for manufacturers. But you'd have turnover in stock and you wouldn't trash old stock.

Tim Melloch: Major impact on claimable savings

Ed Reynoso: Those are net changes.

2018 Outdoor Lighting Phase 1 Disposition

Greg Barker: Some of the baselines are based on a few data points or new vendor (on Amazon) who may not be who a municipality would buy their roadway lights from. You have to ask, is Amazon a valid distribution channel?

Ed Reynoso: They mention early retirement. But you have to consider the preponderance of evidence.

Tim Melloch: True, but that always tends to be a huge challenge.

Deemed Lighting Measures after 2018

Armen Saiyen: The majority of savings for lighting were A lamps.

Tim Melloch: CFLs too.

Armen Saiyen: Where does that fall under this elimination?

Tim Melloch: LED A lamp is green because we already did it but most think it will go away after 2018.

Armen Saiyen: It might be a good measure for new peak load reduction.

Tim Melloch: We were thinking about this in terms of new opportunities: new peak.

4.19 LED Troffer

Ayad Al-Shaikh: Finding out if PreRebUp is being used, if not, we'll take it out.

Ed Reynoso: The cost ID could go away after the eTRM. Don't mind changing the data slightly so we're all in alignment.

4.48 LED in Walk-in Coolers and Freezers

Pierre Landry: The HOU sounds like a lot of hours for a walk in.

Armen Saiyen: Probably includes after hours stocking.

Tim Melloch: Not sure of the source.

Pierre Landry: There is typically a switch outside the door so it's easy to turn off.

9.02 LED Pool and Spa Lighting

Ed Reynoso: Whether its covered by the disposition is a CPUC staff issue.

Gary Fernstrom: No regulations affecting pool lighting so the market by itself isn't going to move to LEDs from regulatory pressure. So it's a good measure for the utilities to push.

Ed Reynoso: Do you need to drain the pool to change it?

Steven Long: Think there are ways around it.

Ed Reynoso: Some commercial pools have access panel.

Gary Fernstrom: Some but not all. There's what they call a cove and you turn off power and reach into pool and pull out the fixture.

Tim Melloch: Hours of use are very low. Don't people use these like landscape lighting?

Armen Saiyen: They might after you change to LED and it allows you more controls and colors.

Gary Fernstrom: Like pool heating, the lighting is used very little. While there is a significant % improvement, because of the low usage, the absolute savings is low.

Pierre Landry: Is this is potentially load building if you turn them on longer especially if you have cool colors with the LEDs?

Future of Lighting

Armen Saiyen: Accelerated replacement might be best opportunity. ET opportunities apply across all measures.

Steven Long: Oddball lighting types. Not just residential but there are a lot in residential.

Ed Reynoso: Savings from controls depends on the user settings/commissioning.

Mike Casey: On interior measures, on tier 2 issues, you have hours of operation and interactive effects, do they use coincident demand factor and is there talk of revisiting those values? In some cases, they seem to be very low.

Ayad Al-Shaikh: There was an update. Don't know the source of them. Those and hours of operation are important for us to dig into.

Mike Casey: For offices, the CDF is .5.

Armen Al-Shaikh: If peak has shifted to evenings, they will go down.

<u>Water Heating</u>
Presenter: Ayad Al-Shaikh

6.02 Flow Restrictors

Tim Melloch: This is direct install, right? Do they have to gather any information on the existing condition?

Ayad Al-Shaikh: Some of them do but we need to follow up. We need to design the measure so it' can't be gamed.

Ed Reynoso: Is it this measure where you have higher savings at private rather than public lavatories?

Ayad Al-Shaikh: That's another measure. We'll discuss it later.

Tim Melloch: You're removing the existing aerator not adding onto it. It didn't burn out since it could stay another 15 years. Add on is an existing system that you're adding something onto.

Chan Paek: You're adding an aerator. A lot of systems don't have an aerator.

Spencer Lipp: You can replace components and still have add on equipment (AOE) measure classification. If you get too literal, nothing becomes AOE. You're adding to the faucet; enhancing a component of the feature.

Chan Paek: Like early retirement. You are throwing out the old one early and putting in a new one.

Steven Long: If the baseline wasn't existing is it above or to code?

Ayad Al-Shaikh: It's above code.

Mike Casey: There is some language that addresses this: the system has to be able to operate without the add on equipment and the add on equipment can't operate by itself.

6.03 Showerheads

Pierre Landry: Are you feeding back these findings to the CPUC?

Ayad Al-Shaikh: We haven't been.

Annette Beitel: Bryan wasn't feeding the information back to Jeff. We're counting on a new vendor; working with the existing team hasn't been effective. Goal is to do these presentations with the new vendor and hand the information off to them.

6.23 Commercial Aerators

Chan Paek: Did some field data collection from hospital and hotels by measuring flow rates. 2.2 gpm average is similar to residential from these study results from 10 years ago. Their existing faucets still have very high flow rates.

Ayad Al-Shaikh: It's still important to ask that question and maybe we can pull that information in here.

Pierre Landry: If installers are collecting baseline, maybe you can wrap that information in ere.

Ed Reynoso: A lot of lavatories come with infrared sensors. Question is flow and how long its running. These are adjustable. Maybe some of data collection looks into those nuances.

6.17/6.19 DHW Loop Temp Control

Pierre Landry: The utilities said they were going to offer these?

Ayad Al-Shaikh: It's still an active measure.

Armen Saiyen: Any programs with it?

Chan Paek: SCG has multifamily offer but never had commercial offer. Found that PG&E has a work paper however it claims very little savings for commercial because the measure exception. Would reduce the temp by a few degrees. SCG multifamily claims a lot more savings using eQUEST modeling. PG&E was to adopt the SCE measure. Would like to see a Cal TF work paper update to revise PG&E saving methodology.

6.18 MF DHW Pump Control

Ed Reynoso: Is this a to code measure? No impacts for above code, only to code. Vary by water heating type.

Armen Saiyen: If it's an existing pump and you add a controller, you don't trigger code.

Ayad Al-Shaikh: We can see if there's anything that takes it above code.

6.21 Pipe Insulation

Pierre Landry: Why are they splitting out pipes and fittings? Can't imagine that fittings are a large portion of the plumbing system.

Chan Paek: The methodology is different. Heat loss through the pipe is greater. Fittings cover valves and elbows.

Pierre Landry: It's not just blown foam?

Chan Paek: No

Spencer Lipp: It's more of a custom installation and cost is substantially different.

Chan Paek: If there was not fitting claims, they may not have offered it.

Spencer Lipp: Find that they do the pipes but not the fittings. Not every company does it because they are custom. It's fit and fastened so it doesn't fall off. Have to leave the valve so you can twist it.

6.22 Tank Insulation

Tim Melloch: No electric tanks?

Ayad Al-Shaikh: Only offered for gas. Any electric?

Jay Madden: For heat pump water heaters.

Steven Long: Not that common.

Jay Madden: Just updated HPWH.

Steven Long: This is larger ones.

Jay Madden: Commercial would be bigger EEI.

Pierre Landry: So this isn't DHW, it's a tank for hot water process.

Ayad Al-Shaikh: So maybe opportunity is smaller for electric.

Pierre Landry: What is unit?

Ayad Al-Shaikh: Per square foot.

Pierre Landry: $9/square foot? Does it have gold thread in it?

Chan Paek: Update on DOE Code Change for Water Heaters. In 2012 there was a law passed requiring new efficiency rate. DOE did this. June 2017 is the effective date of UEF. Engineering services only learned about this change a few months before June 2017. For SCG, all of savings and rebates are based on energy factor. In October 2017, CEC published a guide on the new efficiency rule "CEC-400-2017-012: Water Heater Efficiency Guide." CEC has not amended Title 20 to reflect the new federal standard.

What is different UEF to EF? Four different draw patterns: very low, low, medium, high. SCG found most of the water heaters fall under high or very high. The UEF varies based on size of water heater and draw of water heater. Chan thinks the new system is too overcomplicated. Smaller water factors or EF, larger ones with 75 or greater are rates in thermal efficiency. TE is a simple ratio of energy in and amount of energy the water retains. Input over output in btus. Energy factor is developed for a smaller water heater to get a better sense of the efficiency and one big factor is standby loss.

Gary Fernstrom: The EE standard wanted to capture the standby loss for res storage product. For commercial products, the focus was on absolute efficiency.

Pierre Landry: Is the standby loss a smaller proportion for commercial and thereby can be ignored?

Gary Fernstrom: No. sometimes the commercial use is lower like a water heater in an office restroom might have a lower use than a home.

Spencer Lipp: The smaller the unit, the more likely the storage and combustion is in one unit but for larger units, they are separate.

Chan Paek: Storage where burner and tank is one, go up to 120 gallons.

With the new UEF requirements they've categorized them but no clear distinction/cut off in the rates. So there's a little overlap.

DEER water heater calc provides the savings values. An Excel sheet, macro enabled. Input storage type, etc. it will calculate the unit energy consumption for that unit. Last year, when the ratings changed, they modified the calculator to include UEF technologies. Provided modified calculator to EAR team and they finalized the calculation as v 3.1. Have savings for gas only; didn't include electric savings. SCE analyzing it to make sure it is doing what it's supposed to. They feel comfortable that its

doing what its supposed to do. If the heater has a high draw pattern, the savings go up so there may be opportunity there. It represents a capacity to heat; water heating capacity. High, medium, low, very low. A function of the bth rating and tank size and tested through the test procedure.

Armen Saiyen: Types?

Chan Paek: Small storage res, tankless for res, commercial storage, comm'l tankless,

Gary Fernstrom: How is the electric energy use accounted for for the high energy factor products, .67 products.

Chan Paek: Electric technologies have to be added to this list.

Gary Fernstrom: Isn't there an exhaust fan on the .67 products. Where is it accounted for?

Chan Paek: In the impact calculator. It will have negative electric savings.

Annette Beitel: We're going to collapse these into a single work paper?

Ayad Al-Shaikh: We are going convert them. EF ones go away and UEF ones replace them.

Armen Saiyen: It's a one for one replacement for existing measure.

Chan Paek: Not adding work papers but it will get more complicated with in the work papers.

Pierre Landry: Why just average? You are declaring that you don't have a good feel for the right number.

Ayad Al-Shaikh: Averaging is the easiest way until we can get substantiated numbers.

Pierre Landry: DEER is filled with unsubstantiated numbers.

6.10 Process Boilers

Chan Paek: 260K therms – do you know how much comes from SCG?

Ayad Al-Shaikh: All of it. That's the delta.

Chan Paek: Do you have the data on how many therms?

Ayad Shaikh: Yes

6.07 Commercial Boilers

Spencer Lipp: On process boiler, you had as a stage 2 to look at load factors, but not on the process boilers. Why?

Ayad Al-Shaikh: in general, process applications can be more variable. Potentially it could be a business case or usage but commercial application is more repeatable.

Spencer Lipp: Think they both have some variability but doesn't necessarily the variability because we have a value for it on the process side we're looking for better information but not on the commercial side. Trying to figure out the rational.

Ayad Al-Shaikh: Hours of use may be more common but the business could be different too. Do you have better data?

Spencer Lipp: The CASE study is a T24 study so they probably have a similar one for commercial. Don't know that that's better than what we might have. Seems to be based on a small set of Enovity process boilers but the CEC blessed it.

Armen Saiyen: CEC c/e testing is different than programs. Only difference is they do it on a TDD basis.

Spencer Lipp: Process tends to be very consistent because they are making the same product over and over. Would have the same capacity and load issues in commercial.

Ed Reynoso: You have to have a permit to operate this so CARB may have some data or studies.

Armen Saiyen: They go through testing as well.

Ayad Al-Shaikh: Is it that we should look at commercial boilers as well or that we can only do so well with the process boilers?

Spencer Lipp: In both, it's important to find load profile data somewhere. Better data for commercial is maybe a stage 2 issue.

6.09 Commercial Storage Water Heaters

Pierre Landry: Is there a reason that there is such a big cost difference between SCE and SDG&E?

Ed Reynoso: We adopted DEER so you took the data from an old workpaper that hadn't been updated. That's why it's a little skewed.

Roger Baker: It's also $19K.

6.14 Residential Storage Water Heaters

Annette Beitel: What's the effect going from EF to UEF on savings?

Chan Paek: The medium draw savings is going to be the same as the previous EF savings.

Annette Beitel: so the savings are going to go up in all cases?

Chan Paek: For this analysis, yes.

Armen Saiyen: Unfortunately, not a high impact measure.

Chan Paek: It is for SCG

6.16 Heat Pump Water Heaters

Jay Madden: We're meeting tomorrow on the effects of the disposition on their HP water heater work paper.

Water Heater Measure Affirmation
Ayad Al-Shaikh: Does the Cal TF affirm the subcommittee recommendations regarding Stage 1 issues for water heating measure?

- No one on the phone or in the room opposes the affirmation.