



# Agenda & Notes

## California Technical Forum (Cal TF)

### Meeting #39: Technical Forum (TF)

**April 26, 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 – 9:45	<b>Opening</b> <ul style="list-style-type: none"> <li>Update on measure consolidation schedule</li> <li>Collapsing Cal TF review of consolidated measures</li> </ul>	Annette Beitel, Ayad Al-Shaikh Cal TF Staff
9:45 – 10:30	<b>Water Heating Measures</b> <ul style="list-style-type: none"> <li>Review new information</li> <li>Review notable issues</li> </ul> <b>ACT:</b> Cal TF Affirmation of Consolidated Measures	Ayad Al-Shaikh Cal TF Staff
10:30 – 10:45	<b>Break</b>	
10:45 – 11:45	<b>Agriculture Measures</b> <ul style="list-style-type: none"> <li>Review new information</li> <li>Review notable issues</li> </ul> <b>ACT:</b> Cal TF Affirmation of Consolidated Measures	Ayad Al-Shaikh
11:45 – 12:15	<b>HVAC Subcommittee Overview</b> <ul style="list-style-type: none"> <li>Feedback on proposed approach to consolidating and documenting HVAC measures</li> </ul> <b>ACT:</b> Feedback on the approach	Ayad Al-Shaikh
12:15 – 1:00	<b>Lunch</b> Small Group Discussions (for interested members): <ul style="list-style-type: none"> <li>Utility Incentive Roadmap</li> </ul>	Martin Vu RMS Energy Consulting



	<ul style="list-style-type: none"> <li>• eTRM measure consolidation transition plan</li> <li>• Approach to HVAC measures</li> <li>• Other topics?</li> </ul>	Cal TF Staff
1:00 – 1:30	<b>Appliance/Plug Load Measure</b> <ul style="list-style-type: none"> <li>• Review new information</li> <li>• Review notable issues</li> </ul> <b>ACT:</b> Cal TF Affirmation of Consolidated Measures	Roger Baker Cal TF Staff
1:30 – 2:00	<b>Lighting Measures</b> <ul style="list-style-type: none"> <li>• Review new information</li> <li>• Review notable issues</li> </ul> <b>ACT:</b> Cal TF Affirmation of Consolidated Measures	Tim Melloch Cal TF Staff
2:00 – 2:15	<b>Break</b>	
2:15 – 2:45	<b>Home Energy Reports</b> <ul style="list-style-type: none"> <li>• Subcommittee Report-Out</li> <li>• Review notable issues</li> </ul> <b>ACT:</b> Cal TF Affirmation of Consolidated Measures	Roger Baker
2:45 – 3:00	<b>Close</b> <ul style="list-style-type: none"> <li>• Recap agreements &amp; action items</li> </ul>	Annette Beitel

## Meeting Materials

- Measure Consolidation and Review Schedule
- Presentation: Water Heating Measures
  - Water Heating Measures Affirmation Slide
- Presentation: Agriculture Measures
  - Agriculture Measures Affirmation Slide
- Presentation: HVAC Subcommittee Overview
- Presentation: Appliance/Plug Load Measures
  - Appliance/Plug Load Measures Affirmation Slide
- Presentation: Lighting Measures
  - Lighting Measures Affirmation Slide
- Presentation: Home Energy Reports Measure
  - Home Energy Reports Affirmation Slide



## I. Attendees

	<i>In-Person</i>	<i>Via Telephone</i>
<i>Cal TF Staff</i>	Annette Beitel Jennifer Barnes Ayad Al-Shaikh Roger Baker Tim Melloch	
<i>Cal TF Members</i>	Doug Mahone retired HMG/TRC Pierre Landry Landry & Associates Steven Long Lockheed Martin Martin Vu RMS Energy Consulting Larry Kotewa Elevate Energy Mehdi Shafaghi LADWP Chan Paek So Cal Gas Larry Brackney NREL Mike Casey Onsite Energy Tom Eckhart UCONS	Cathy Chappell TRC Spencer Lipp Lockheed Martin Sepi Shahindard Cadmus Gary Fernstrom retired PG&E George Beeler AIM Ryan Hoest EcoVox Greg Barker Energy Solutions Ed Reynoso SDG&E Lisa Gartland Proctor Engineering Chris Rogers CleaRESULT Yeshpal Gupta Lincus Stefano Galiasso University of Illinois Chicago Ron Ishii AESC
<i>Non-TF Attendees</i>	Linda Wan PG&E Jay Madden SCE Bob Ramirez DNV GL Shanna Dee, SDG&E	Kelvin Valenzuela SDG&E Jia Huang PG&E Henry Lui, PG&E Charlene Spoor PG&E Mananya Chansanchai, PG&E Christian Weber PG&E Joe Prijyanonda Ben Lipscomb National Comfort Institute



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

### Water Heating Measures

- The Cal TF affirmed the following water heating measures:
  - 6.24 Low-Flow Showerheads, Commercial
  - 6.25 Recirculation Pump Time Clocks
- Action Items:
  - For 6.24 Commercial Low Flow Shower Head Replacement:
    - Cal TF Staff to find out if showerheads are collected during audits.
    - Martin Vu to send out the study on low flow shower head replacements at the California correctional facility.
  - For 6.25 Recirculation Pump Timer:
    - Cal TF Staff to:
      - Confirm NTG ratios, why different from IOUs/POUs; and
      - Develop translation tables between implementation types.
  - For 6.26 Residential Smart Pump:
    - Cal TF Staff to review PG&E disposition on this measure.
  - For 6.18b: DHW Pump Demand Control (VFD):
    - Cal TF Staff to:
      - Determine if pipe insulation should be required as part of the measure if pipes accessible; and
      - To follow-up with Larry Brackney and PG&E building prototypes for VFDs.
- Stage II Items:
  - For 6.24 Commercial Low Flow Shower Head Replacement:
    - Collect baseline size, water usage (hours of operation), building type; and
    - Consider whether commercial should be a building type – review data collected to see variation across building types and review associated baseline, water usage.
    - Determine whether shower heads are being collected as part of audits.
  - For 6.26 Residential Smart Pump:



- Harmonize IOU and POU NTG values

#### Agriculture Measures

- The Cal TF affirmed the following agriculture measures:
  - 3.14 Greenhouse - Heat Curtain
  - 3.15 Greenhouse - Infrared Film
  - 3.16 New Water Pump Upgrade
  - 3.17 Enhanced VFD on Ag Pump
- Action Items:
  - Ayad Al-Shaikh to provide Larry Brackney with prototype details for 3.14 Greenhouse Heat Curtains; and
  - Ayad Al-Shaikh to circle back with the RTF to check on vertical shaft and submersible.
- Stage II issue:
  - Consider savings by crop type

#### Appliance Plug Load Measures

- The Cal TF affirmed the following plug load measures:
  - 7.16 Smart Strips (including Tier 2 connected)
- Stage II issue:
  - For 7.16 Smart Strips: SCE pre/post model, which is what EAR team requested. Will this study address the gap identified in the disposition?

#### Lighting Measures

- The Cal TF affirmed the following lighting measures:
  - 4.19 LED, Troffer (2x4, 1x4, 2x2)
  - 4.22 LED, Landscape
  - 4.51 LED, Pool
- Action Items:
  - Cal TF Staff to add definitions of luminaire and fixture to glossary
- Stage II Issues:
  - For measure 4.19 LED Troffers: There was a lot of discussion around what values to use in multi-family common areas



- For measure 4.22 LED Landscape: Consider the impact of reduced line losses when lamp wattage is reduced
- For 4.51 LED Pool & Spa: Investigate viability of adding spa offering for non-res (hotel/motel). This should be the same opportunity as exists for hotel/motel pool lights.
- Investigate incremental opportunities to save energy.

#### Miscellaneous Measure

- The Cal TF affirmed the following miscellaneous measures:
  - 11.01 Home Energy Reports

## II. Meeting Notes

### eTRM SCHEDULE FOR 2018

Presenter: Ayad Al-Shaikh

Ayad Al-Shaikh reviewed status & schedule

- Q1 goals: 15 measures to be reviewed today
- Q2: 25 measures
- Q3: Remaining measures HVAC
- Total number of consolidated measures < 150

Will use a different process for the rest of the consolidated measures:

- Measure presented to TF only one time
- Eliminate 1<sup>st</sup> presentation of measures

Plan to finish non-HVAC measures by end of Q2.

Plan does not include new measures.

Exit of lighting measures significantly impacted new measure development and set of deemed measures in EE portfolio.

Gary Fernstrom – Codes and standards effort recognizes control to increase lighting efficacy. Deemed program managers could advocate for controls; would be valuable addition to lighting portfolio.

Will begin subcommittee meetings next week for Q2 measures.

Linda Wan: What does it mean when the Cal TF affirms a measure?



Annette Beitel: Cal TF member supports measure, taking into account the subcommittee analysis and deliberations. “I’m comfortable with this being a Cal TF affirmed measure”

Tim Melloch: Explained consolidated measure, why affirmation is needed. As per CPUC direction, not changing measures only making consistent to be available statewide.

### Water Heating Measures

Presenter: Ayad Al-Shaikh

Affirmation for 6.24 Low Flow Shower Heads, 6.25 Recirculation Pump Time Clock, 6.26 Residential Smart Pump.

Not for 6.18b Demand Control VFD for Centralized Water Heater Recirculation Pump because of overlap with 6.18.

### *6.24 Commercial Low Flow Shower Heads*

Tom Eckman: 6.25 Why only gas – why not electric? We have electric and gas savings in Pacific NW?

Ayad Al-Shaikh: Because gas is so dominant.

Chan Paek: Only certain types of buildings have this measure. This measure is targeted for specific building types. Extending to “com” b/c direct install contractors can install in any facility with shower.

This commercial showerhead measure is only targeting specific commercial building type. Most commercial may not have showers. However, when contractors do audits. The reason why we applied commercial in workpaper; we have a direct install contractors. Ex ante review team may have issue. We did not provide data that provides savings from building prototypes. We only have data from schools, and asked that we apply to all other commercial.

Tom Eckman: The rumor is that California has put a real big emphasis on heat pump water heaters replacing gas for this application.

Chan Paek: I’m not sure about this but I know there is a trend to move to all-electric homes.



Doug Mahone: Is the program going to have screening requirements to screen out weak applications in the commercial sector?

Chan Paek: The only requirement relating to programs is that existing must be 2.5 gpm or above. As long as the showerhead is 2.5 gpm or high.

Doug Mahone: Hours of operation are critical parameter in savings.

Chan Paek: Exactly, we did not have any values except schools. Schools hours of operation is  $\frac{1}{2}$  of lodging, so we just used schools because we have data.

Ayad Al-Shaikh: Previously we used homes, and this is first time.

Pierre Landry: If it goes to an evaluation, the other commercial applications will be thrown out. In my Boy Scout Council office, we have a shower and it is only used once per week.

Chan Paek: This makes us think about whether we should put much effort and resources into figuring it out.

Pierre Landry: One approach – don't claim savings but you'll see on gas grid. It is annoying that it will be a smaller number.

Chan Paek: If we don't allow, we miss the opportunity.

Steven: In the past we've gotten EM&V in future. Maybe add this to Stage II.

Chan Paek: We should probably see how many installations we are doing.

Steven Long: If we don't get many installations

Gary Fernstrom: A little off the subject. What is accelerated replacement?

Martin Vu: Federal correction institute in Hermong, California that replaced 2.5 gpm with 1.5 gpm. Are you aware of that study?

Chan Paek: No, I am not aware of that study.

ACT: Martin Vu will circulate the study.



Pierre Landry: I am struggling on commercial building type. It will be small, variation will be large. We are adding “chaff” to system. Incremental cost.

ADD: Stage II Issue:

- Collect baseline size, water usage (hours of operation), building type; and
- Consider whether commercial should be a building type – review data collected to see variation across building types and review associated baseline, water usage.

Steven Long: LEED offers this as a credit. They might have data on how often added?

ACT: Follow-Up: Pierre: Are showerheads collected during audits?

#### *6.25 Recirculation Pump Timer*

ACT: Confirm NTG ratios, why different from IOUs/POUs.

ACT: Doug Mahone: Since implementation types are being renamed. Can someone put together translation tables?

### **Water Heating Affirmation**

Ayad Al-Shaikh: Does the Cal TF affirm the subcommittee recommendations regarding the Stage 1 issues for water heating measures?

- No one on the phone or in the room opposes the affirmation for:
  - 6.24 Low-Flow Showerheads, Commercial
  - 6.25 Recirculation Pump Time Clocks

#### *6.26 Residential Smart Pump*

Gary Fernstrom: Why should NTG be any difference?

1. POU's were using .7
2. IOUs don't have a NTG for IOUs

Stage II ACT: Harmonize IOU and POU NTG values.

ACT: Review PG&E disposition on this measure.

#### *6.18b: DHW Pump Demand Control (VFD)*



Gary Fernstrom: Where you are including variable speed control, savings are dependent on control algorithm, not variable speed drive itself. I would be interested in seeing how control algorithm works.

Ayad Al-Shaikh: It is trying to be agnostic.

Chan Paek: Workpaper analyzed savings based on assumption that VFD would maintain difference between supply and return at 20 degrees. The return line at the end of the loop would have 130 degrees.

Gary Fernstrom: That is reasonable assumption. I would just want to validate that equipment actually operates this way in the field.

Chan Paek: Yes, we put this in as a requirement. This is what we have seen in ET fields studies and technology documents.

Gary Fernstrom: OK, you've completely addressed my comment. Thank you.

Chan Paek: Other items that could be troublesome. Ex ante thinks this is replacement measure. This requires replacement of pump.

Steven Long: Do you have to replace pump as part of this measure?

Chan Paek: Yes.

Gary Fernstrom: Well then replacement scenario is different from variable speed than on/off. If this measure includes different technologies, if VFD, need to replace pump motor. If on/off only, then you don't need to replace pump.

Chan Paek: If vendor replaces on/off. Still replaces pump.

Pierre Landry: For on/off, why would you have to replace pump?

Pierre Landry: Why 80 differential low rise, high rise.

Ayad Al-Shaikh: Exclusively comes from loss in pumps and flow rate is different, low rise to high rise. These are the two parameters that are changing in these models.

Pierre Landry: No requirement that pipes be insulated. Does this trigger code? Analysis assumes that % of pipes have some insulation.



Larry Brackney: MF high rise pipes typically not insulated

Gary Fernstrom: cost prohibitive to insulate pipes, not trigger code

ACT: Should pipe insulation be required as part of the measure if pipes accessible?

Chan Paek: Data collection effort monitored boiler on-off time, with that data they compared pre and post consumption with measure. This is how they developed savings from low-rise and high rise. This workpaper had different approach. Using EQuest – has much lower savings (equivalent to high rise – lower savings). Contractor not happy. I'm concerned with utilities.

Gary Fernstrom: Variable speed has lower savings than on/off version. I would think it would be other way around. Variable speed is more expensive, so why would you do any variable speed?

Gary Fernstrom: Fundamental question: How are gas savings treated relative to electric to electric savings overall for this measure? Is this a gas-only measure?

Chan Paek: Gas – reduced gas usage at boiler. Electric: reduced usage of pump.

Gary Fernstrom: If variable speed is more expensive and has lower savings, should we even be using it.

Chan Paek: Old WP, water savings very high compared to actual MF usage, but staff approved.

Ag Consensus: Curtains retracted at night. During day, active so improves insulating. Reflective film on bottom layer of curtain. Save gas on overhead heaters.

Larry Brackney: If the interior material is reflective, is there interactive effect with lighting power density?

Ayad Al-Shaikh: I have not heard of this. I don't know I will look into whether interactive effects are applied based on LPD at night and reflective film.

Larry Brackney: What did they use as a prototype? I was not aware of this as a prototype. It is not in MASControl.



ACT: Ayad Al-Shaikh: I will follow-up with PG&E and you on this point.

#### Agriculture Measures

Presenter: Ayad Al-Shaikh

##### *3.14 Greenhouse Heat Curtain*

Larry Brackney: Is there interactive benefit w/ LPD?

Larry Brackney: What was used as prototype in model?

ACT: Ayad Al-Shaikh to provide Larry Brackney with prototype details.

##### *3.15 Greenhouse IR Film*

Application type is ROB because IR film is integral to material.

Steven Long: Does the DEER measure exceed standard practice relative to Navigant study? Is there a concern that the DEER measure has not been updated?

Gary Fernstrom: My question complements Steve's? If PG&E sunsets measure, who is the implementer proponent who wants to revive it.

Ayad Al-Shaikh: Navigant report was not conclusive of standard practice.

Ayad Al-Shaikh: SDG&E and SCE currently used.

Chan Paek: SCG using measure for a long time. DEER was last updated in 2011. SCG claiming a lot of savings. Top 5 measure.

Gary Fernstrom: OK, I just wanted to make sure there is a utility proponent.

Chan Paek: NTG is from DEER (0.46) from impact evaluation. Question regarding free ridership, industry standard practice specifies adoption curve of technology, etc. I did bring up to Commission staff that there does seem to be NTG. They always want to see evidence of NTG or program standard practice. Staff could not give clear answer. Need clarification on these topics.

Chan Paek: Ex ante consultant reported that NTG, industry standard practice and program influence all the same thing and this topic will be discussed in WG 2.



Steven Long: Even though measure old, ex ante has not “killed”. For some reason, this measure is still viable. May be disputes about what it should be but still.

Larry Brackney: We need to brainstorm around new areas. Having come from CO, I was routinely hearing horror stories where they were experiencing massive T&D issues. Suddenly feeder overloaded. Massive problems for warehouses (cannabis). Not clear to me what programs will be established. Grow houses can be established in any warehouse. In Colorado, there was big push in cannabis industry to go to grow houses so they can control lighting. There was preference for security to lighting to go to grow house vs. greenhouse. Not clear how quickly market will evolve.

Steven Long: Is this new building prototype?

Larry Brackney: We had started developing grow house prototype. But DOE said no because of optics.

Shanna Dee: SDG&E has done market studies. There have been 1- 2 workshops at Commission. Utilities did not want federal attention from federal government. Some work has been done.

Greg Barker: Design Lights Consortium starting lighting efficiency initiative.

Linda Wan: Crop type is an important consideration for stage II issues for savings determination.

ACT Stage II: Consider savings by crop type in stage II.

Larry Brackney: Growers are incredibly shrewd. They look at different wave lengths for LEDs. This is considered trade secret. Not all growers have this level of knowledge. There may be opportunities to share best practices.

Bob Ramirez: Evaluation issue. Currently evaluating ...grow houses do not want to participate in evaluation, surveys, etc.

Gary Fernstrom: questionable if EE programs can influence the market because decision making other strong drivers.

Gary Fernstrom: CPUC Staff has indicated this is not a good area for inquiry because of the political/legal ramifications. Also, growers more concerned about optimizing conditions for product growth (productivity and higher outcome).



Gary Fernstrom: For Xcel: Lowest cost production night. For CA. peak period is early afternoon to evening. We may not have same generation cost structure that CO.

Jay Madden: One change currently being offered. Infrared film is integral to measure.

Larry Brackney: A lot of gaps in market knowledge and how Excel could serve the market

### *3.16 Clean Water Pump Upgrade*

DOE – Pump Energy Index – 20/20 will have to be built to be less than 1.0 value. PG&E is trying to drive.

Gary Fernstrom: I have thought on how DOE standard will affect market. Submersible pump and vertical shaft not subject to regulation or vertical shaft. Federal regulation may not apply to submersible/vertical shaft pump. This is still very strong measure.

ACT: Ayad Al-Shaikh to circle back with RTF to check on vertical shaft and submersible.

Gary Fernstrom: This was big issue for NW as well as PG&E when this was going through. If DOE did not address, the incentive programs should.

### *3.17 Enhanced VFD on Ag Well Pumps*

Linda Wan: We haven't received any applications since beginning of year so we are thinking of adding a mid-tier. Pain point – filtered fan cooled area. We are thinking instead of x number of issues off ground.

Ayad Al-Shaikh: Linda talked about mid-tier because uptake is slow for this measure. However, this is a nice step for measure.

Gary Fernstrom: RASS shows that 8% of PG&E homes have individual well pump which is significantly higher than SoCal. Because there is sparsity of residential programs and few submersible motors this might be good opportunity for res market.

Linda Wan: Another bullet – opening it up to open vessel. Randy said one requirement is that it must pump into pressurized system or won't realize savings.



Gary Fernstrom: Savings is variable speed is totally related to dynamic head. If you have non-pressurized system, you have static head and there is little to be gained from VSDs.

Linda Wan: To clarify, not enhanced VFD, it is enhanced spec for VFD. I don't know how it saves more energy than just VFD. I think it has to do with power quality.

Pierre Landry: Any consideration if this measure is ISP?

Ayad Al-Shaikh: installation numbers in state are still low

**Agriculture Measure Affirmation:**

Ayad Al-Shaikh: Does the Cal TF affirm the subcommittee recommendations regarding Stage 1 issues for agriculture measures:

- No one on the phone or in the room opposes the affirmation for:
  - 3.14 Greenhouse - Heat Curtain
  - 3.15 Greenhouse - Infrared Film
  - 3.16 New Water Pump Upgrade
  - 3.17 Enhanced VFD on Ag Pump

HVAC Measure Consolidation Process

Presenter: Ayad Al-Shaikh

DEER measure

Partial DEER measure

Non-modeled measures

Appliance & Plug Load

Presenter: Roger Baker

*7.16 Smart Strips*

Split savings in eTRM out into IR and IR+OS from blended (based on EAR disposition)

Added Tier 2 connected power strips (per SCE work paper) with additional permutations to address

Jay Madden: SCE will be resubmitting Tier 2 workpaper, primarily eligibility requirements. Review revised qualifications submitted by SCE as a Stage II issue.

Martin Vu: Any discussion with IOUs to use higher IR value since measures separated in eTRM? SCE study may help support.



Linda Wan: Questioned the separation of the measures when the disposition included a blended value (for IR and IR+OS). Roger replied that the blended value was there along with the IR and IR+OS values based on the IOU request but he didn't believe the disposition precluded the use of the separate values.

Roger Baker: most interest is in connected device.

Stage II ACT: SCE pre/post model, which is what EAR team requested. Will this study address the gap identified in the disposition?

Roger Baker – Can address in stage II

**Appliance Plug Load Affirmation:**

Roger Baker: Does the Cal TF affirm the subcommittee recommendations regarding Stage 1 issues for appliance plug load measures?

- No one on the phone or in the room opposes the affirmation for:
  - 7.16 Smart Strips

Lighting

Presenter: Tim Melloch

*4.19 LED Troffers*

Residential or commercial values appropriate for multi-family common areas?

Hours of use – per disposition can use commercial HOU in multi-family common areas (see 2015 disposition?), but for all other values need to use residential values (NTG, GSIA, etc.)

Linda Wan: MF common used to be its own building type

Steven Long: Lots of inconsistencies, definitely address in stage II proper values to use in multi-family common areas

Stage II ACT: Address proper HOU/building type values to use in multifamily common areas.

Gary Fernstrom had a question about how this measure determines savings (based on watts/kilolumen). Greg Barker who worked with PG&E on developing this measure sent a follow-up to Gary to explain.



#### *4.22 LED Landscape*

Outdoor lighting disposition issued in March 2018 suggests that the baseline technology mix for most outdoor lighting applications is 100% LED.

Gary Fernstrom: In response to our urging members to think of incremental opportunities to save energy, Gary pointed out that there is also a considerable reduction in wiring losses (line losses, I<sup>2</sup>R) when we reduce the lamp wattage (and therefore the current). This will be added to the Stage II issues list.

Stage II ACT: Investigate incremental opportunities to save energy.

#### *4.48 LED in Walk-in Coolers & Freezers*

Presented status of the measure and outlined reasons for not seeking affirmation today. Stage 1 issues that still need to be resolved deal with differences in how indirect savings are calculated in the workpaper text linked to refrigeration efficiencies (based on DOE2.2) compared to the ex ante values (which utilize the interactive effects table). The other Stage 1 issues to resolve deals with the calculation of the EUL (16 yrs vs. 10.6).

#### *4.51 LED Pool & Spa*

Gary Fernstrom: Operating hours very low in res; high in small commercial market. Thus, I have concerns about offering to residential. They should not be lumped together. Multifamily is considered commercial.

Gary Fernstrom: Why should this measure not be applicable to spa measures?

Jay Madden: There was no distinction between pool/spa light.

Steve Long: For residential, spa and pool had different operating hours per study. However, for commercial (motel) spa and pool had same hours.

Gary Fernstrom: At the local hotel, for pool lighting, there should be no difference whether light is in spa or pool. Either is a good opportunity.

Stage II Issue: Investigate viability of adding spa offering for non-res (hotel/motel). This should be the same opportunity as exists for hotel/motel pool lights and should not be excluded (Gary). The general consensus was that in the hotel/motel application the



HOU for lighting will be the same for pools and spas. The variation in operations (HOU) would have more to do with the pumps (i.e. spas operate pumps “on-demand”).

**Lighting Measure Affirmation:**

Tim Melloch: Does the Cal TF affirm the subcommittee recommendations regarding Stage 1 issues for lighting measure affirmation?

- No one on the phone or in the room opposes the affirmation for:
  - 4.19 LED, Troffer (2x4, 1x4, 2x2)
  - 4.22 LED, Landscape
  - 4.51 LED, Pool

*4.48 Refrigerated Walk-in (not seeking affirmation)*

ACT: Pierre Landry: Add definitions of luminaire and fixture to glossary

Home Energy Reports

Presenter: Roger Baker

Discussion of double counting between universal audit tool and home energy report.

Martin Vu: Asked about differences in POU and IOU savings that used same evaluation method.

Linda Wan: This is a process workpaper, describes how claim savings ex post.

**Miscellaneous Measure Affirmation:**

Roger Baker: Does the Cal TF affirm the subcommittee recommendations regarding Stage 1 issues for miscellaneous measure?

- No one on the phone or in the room opposes the affirmation for:
  - 11.01 Home Energy Reports