Agenda

California Technical Forum (Cal TF)

Meeting #37: Technical Forum (TF)

February 22, 2018

9:30 am – 5:30 pm

Pacific Energy Center
851 Howard Street
San Francisco, California

Time	Agenda Item	Discussion Leader(s)
9:30 – 9:45	**Opening**	Jennifer Barnes, Cal TF Staff
9:45 – 10:30	**Commercial Refrigeration Measures** • Review new information since "Tier 1" presentation • Review notable issues **ACT:** Cal TF Affirmation of Consolidated Measures	Ayad Al-Shaikh Cal TF Staff
10:30 – 10:45	**Break**	
10:45 – 12:00	**Commercial Refrigeration (continued)**	Ayad Al-Shaikh
12:00 – 12:45	**Lunch**	
12:45 – 1:45	**Update: DEER Building Prototypes Update and Demo**	Larry Brackney NREL
1:45 – 2:45	**Appliance/Plug Load Measures** • Review new information since "Tier 1" presentation • Review notable issues **ACT:** Cal TF Affirmation of Consolidated Measures	Roger Baker Cal TF Staff
2:45 – 3:00	**Break**	
3:00 – 3:45	**Appliance/Plug Load (continued)**	Roger Baker

Time	Agenda Item	Discussion Leader(s)
3:45 – 4:00	**Break**	
4:00 – 5:15	**Lighting Measures** • Review new information since "Tier 1" presentation • Review notable issues **ACT:** Cal TF Affirmation of Consolidated Measures	Ayad Al-Shaikh
5:15 – 5:30	**Close**	Jennifer Barnes

Meeting Materials

- Presentation: Commercial Refrigeration Measures
- Presentation: Appliance / Plug Load Measures
- Presentation: Lighting Measures

I. Attendees

	In-Person	*Via Telephone*
Cal TF Staff	Jennifer Barnes Ayad Al-Shaikh Roger Baker	Tim Melloch
Cal TF Members	Bing Tso SBW Spencer Lipp Lockheed Martin Sepi Shahindard Cadmus Gary Fernstrom retired PG&E Doug Mahone retired HMG/TRC Steven Long Lockheed Martin Martin Vu RMS Energy Consulting George Beeler AIM Ryan Hoest EcoVox Larry Kotewa Elevate Energy Greg Barker Energy Solutions	Cathy Chappell TRC Mike Casey Onsite Energy Chris Rogers CleaRESULT

	David Springer David Energy Group Ed Reynoso SDG&E Mark Modera UC Davis Armen Saiyan LADWP Chan Paek So Cal Gas Larry Brackney NREL Lisa Gartland Proctor Engineering Mehdi Shafaghi LADWP Mary Matteson Bryan Energy Engineering	
Non-TF Attendees	Linda Wan PG&E Jay Madden SCE David Shallenberger Synergy Bob Ramirez DNV GL Amit Kanuango DNV GL Domenico Gelonese Embertec	Charlene Spoor PG&E

I. Key Decisions and Action Items

1. **Commercial Refrigeration Measures**
   - Should there be additional building types for 1.21 Ultra Low Temp Freezers? Let Ayad know if there are any your organization would like to include.
   - The commercial refrigeration measures were affirmed by a consensus of TF members present.
2. **DEER Building Prototypes Update**
   - Cal TF should seek to understand assumptions that were made in developing DEER Building Prototypes and review.
   - The analysis controller should be the technical analysis only. Any policy or other savings “deraters” should be separate from the Analysis Controller.
3. **Appliance Plug Load**

- A majority of the Cal TF members in attendance affirmed the appliance plug load measures.
    - There was one recusal from the vote and one TF member abstained from voting because of the use of site energy in developing the measures rather than source energy which would take into account production/transmission losses.

4. **Lighting Measures**
    - To consolidate climate zones across IOU territories, we agreed to move forward with a simple averaging, but investigate what a longer-term solution would look like.
    - A majority of the Cal TF members in attendance affirmed the lighting measures.
        - 3 TF members recused themselves from the vote.

II. Notes

Introduction (Ayad Al-Shaikh)

Mark Modera: (re measure list) Would be good to keep the stuff (measures) that was knocked off because everything comes back around and when it does, we wouldn't have to recreate everything.

Gary Fernstrom: I would like the group's perspective on trying to come to agreement on what the savings are. The thing that brings improved effectiveness is that all the IOUs are offering the same measure the same way. That's how we improve. Right now, some utilities offer a measure and some don't. We're missing the boat if we don't get on the same page with the offerings.

Most measures are applicable statewide with only a few valid exceptions.

Gary Fernstrom: Agree that purpose of eTRM is to get everyone on the same page and routinized. Some measures are better suited to Northern or Southern California. There maybe some climate differences or the market is more mature in terms of vendors in

one area. But do we agree that we should be on the same page and utilities should try to make offerings more consistent?

How do we make the utilities make offerings more standardized?

Pierre Landry: It should be the exception not the rule for the big players to not offer something.

Commercial Refrigeration Measures (Ayad Al-Shaikh)

- **1.01 ASH Controls**
  - Vary by climate zone
  - Low and medium temp
  - Measure application change specific to PG&E
- **1.02b Replace ASH Display Door**
  - Freezer only
  - 17% increase in cost is change from ROB to early retirement so you have to use full cost.
- **1.03a Display Case ECM retrofits**
  - Tried to do collapsing of measures to simplify. Show all information but the difference in savings due to climate zone is small.
  - Costs handled a little differently by utility. Standardized this and it changed cost effectiveness dramatically.
- **1.02b Walk ins ECM Retrofit**
  - Was ROB but is early retirement now. Have to use full measure cost which effects TRC.
  - Code associated with this now – T20 regulates motors. If we used code as the baseline there would be no savings. With early retirement there is savings but we have to use full cost.

Cal TF Comment: Therm changes?
It's probably just rounding.
The more efficient motor isn't dumping as much heat into the space. That should be the same.

- **1.04 Refrigerated Storage Auto Closer**
  - Vary by cooler/freezer
  - Vary by climate zone
  - PG&E changed from ROB to REA

- **1.05 Walk in Cooler/Freezer & Refrigerated Storage Evap Control**
  - Vary by control (fan cycling versus VFD)
  - Vary by climate zone
  - Costs aligned to WO017
- **1.06 Floating Head Pressure Controls**
  - Permutations that reflect all CZs so it's truly statewide (many thanks to Chris Rogers!)
  - Better number for cost per unit of measure (WO017).
  - Big increase in cost for PG&E.
  - Incentive varies across the state; used a consistent value for CET.
- **1.06a FHP Controls Multiplex Systems**
  - Now we have values for all CZ in CA.
  - Added measure for POUs
- **1.07 Refrigerated Night Covers**
  - WO017 changed SDG&E c/e. PG&E had updated their value already.
  - Savings is identical to what is in WPs today.

Ayad Al-Shaikh: The message for a lot of measures is cost is an important variable for us to deal with. It's affecting measures dramatically. If we have a way to accumulate cost data regularly, it will help us with cost effectiveness over time.

- **1.08 Insulate Bare Refrigeration Lines**
  - Permutations for freezer and cooler.
  - Cost for freezer insulation is a little more expensive than refrigerators.
- **1.09 Adding Doors to Walk in Coolers**
  - Varies by baseline fan (standard/efficient)
- **1.10 Compressor Retrofit**
  - Some vintage permutations
  - Originally a PG&E measure but built out significantly. Still have early retirement for 75% of the state.
- **1.14 FHP Controls for single compressor**
  - Have 16 CZ now based on DOE2 runs now.
  - Using same savings methodology as current.
- **1.17a Display Case Replacement**
  - Permutations by equipment class
  - No claims in 2016 or 2017
- **1.18 Add Medium Temp Case Doors**
  - Permutation by baseline (with and without night covers)

    - Climate zone
- **1.19 Adaptive Refrigerator & Freezer Controls**
    - New measure so no comparison to 2016/2017
    - Savings between CZ is small so possible removing that and collapsing into a single category.
- **1.21 Ultra Low Temp Freezer**
    - Permutations vary by freezer size.

Ayad Al-Shaikh: Should there be other building types? Community colleges? Hospitals? Nursing homes? Other education? Medical office buildings? Circle back soon if you want to see changes.

Ayad to send Jay Madden a note to ask if there are other building types to include and Jay will ask his folks.

Cal TF Comment: Savings don't vary by building type but applicability will. Why put a limitation on the measure? Include building types where savings are appropriate.

Ayad Al-Shaikh: There's a lot of assumptions that go along with the measure and the usage has to be consistent. Indirect savings from HVAC so that varies by building type.

- **1.22 Com Reach in Ref and Freezers**
    - Removing coincident demand factor from calculation. Originally came about b/c all food service measures had it. But for a refrigerator, but the methodology is already conservative, so the additional reduction wasn't necessary.

Commercial Refrigeration Affirmation
A consensus of the Cal TF members in attendance confirmed that they agree with the commercial refrigeration subcommittee recommendation to affirm the measures:

- Ayes: 18 in room; Chis Rogers on phone.
- Nays: None in room or on phone.

Appliance Plug Load (Roger Baker)
RPP was its own work paper but we deconstructed it into its individual measures. We also Consolidated power strips into a single measure.

- **7.01 ES Refrigerator**
    - Savings is consistent with claims data.

    - Big difference is in cost. Method is the same but change is due to direct install (DI) delivery.
- **7.03 Refrigerator Recycling**
    - Measure largely sunset but IOUs but POUs still using.
    - Probably opportunity for the measure in the future in a little diff format. Stage 2 will address market design.
    - Adjusted claims savings. Because this information is from 2016 which is pre/post disposition.
- **7.04 ES Clothes Dryer**
    - Part of retail products program (RPP) so treat appropriately within that platform.
    - LADWP incents the heat pump dryer only.
- **7.16 Smart, Advanced Power Strips**
    - Want an approach that's flexible enough to handle new technologies.
    - There is new data (phase 3 on connectivity) and an approved work paper that makes the measure cost effective for SCE again.

Domenico Gelonese of Embertec: An averaging approach was pushed by a couple people in an IOU for administrative expediency. It wasn't approved/adopted by the Cal TF. It benefits the lower performing technology. Now the IOUs are promoting the lower performing technology. It caused the players to say/believe that the process is broken. We've let the process be hijacked (detrimentally) by a couple of individuals at the IOUs.

Dave Shallenberger: Synergy is an implementer and we have been following this for several years. This process/issue has had a negative effect on this. We installed 40-50K of these before they did the averaging. After averaging the savings, because a couple of people did an end run around this group, it brought down the cost effectiveness of the measure. Last year they only installed a couple thousand of these.

Domenico Gelonese: Need companies who innovate around the table there (on the Cal TF).

The IOUs made the decision to average the savings but it was outside of this group's purview.

For these products, they are different and have different savings. We could get caught up by other vendors saying their products are different when they aren't. There has to be some kind of process/criteria.

We're recognizing the two functions, IR and blue tooth.

In stage 2 we want to look at the feature set.

A consortium might be a good idea.

Set up a rule set: maybe if the savings is greater than 10% between brands if there's solid evidence.

- **7.05 ENERGY STAR Clothes Washer**
  - The savings come from the machine, the water heater, and the dryer. Determining savings can be challenging.
  - Some of 2016 ex ante data was from 2014 but there was a code change that skewed the values when you did a comparison. This year was another code update and we're just getting the WPs from the IOUs. ENERGY STAR was also updated.
  - SCE therms – don't claim any gas savings so it looks like a large increase but it's because they don't claim gas savings.
- **7.09 Ozone Laundry**
  - No big controversy and the numbers aligned for the most part.
  - Big stage 2 issue is trying to determine ancillary savings impacts. Some hot water pumping savings that's worth looking at. O3 generator uses just a little energy.
- **7.12 ENERGY STAR Res Dishwashers**
  - Only SCG WP. Used an interpolation (between 260 and 180 kWh) to get to savings. Problem is that there isn't a 180 kWh model on the market. We would like to get from the EAR team what their basis is for including 180 kWh model in the interpolation when no models exist in market.
- **7.14a Residential Room AC**
  - Two tiers.

Gary Fernstrom: Does anyone offer a room AC program? These are window and wall units. The room AC sits in the room with a hose out the back.
LADWP had a direct install room AC program for low income; a swap. It's being offered through RPP.

- **7.14b Res Room Cleaner**
  - Savings by CZ but not by PA.
  - RPP measure list is updated in September for the following year.

- **7.15 Network PC Power Management**
  - Specific building types (8) eligible for the measure.
  - Weighted statewide value.
- **7.18 Vending Merch Cooler Controller**
  - IOUs in CA have the most conservative estimate of savings of any in the country. Most TRMs use a higher savings value. Would like to justify higher savings in stage 2.

Appliance Plug Load Measure Affirmation
A consensus of the Cal TF members in attendance confirmed that they agree with the appliance plug load subcommittee recommendation to affirm the measures:

- Ayes: 20 in the room; 3 on the phone
- Nays: 0 in the room
- Recusal: 1 in the room
- Abstentions: 1 in the room

Gary Fernstrom: I'm abstaining because of the way certain appliances and appliance systems that use gas and electricity are treated, for instance, clothes washers and dryers. The ENERGY STAR qualification and rating are based on site BTU usage, while CA focuses on/uses a source BTU basis. Using site energy methods with measures that (like clothes washers and dishwashers) trade electric usage for gas savings can result in favoring products that actually increase source BTU consumption. It doesn't result in the right outcome for California ratepayers. I didn't vote against because there's a limit as to what we can and can't do but it's not in the best interest in of the state's rate payers.

Update: DEER Building Prototypes Update and Demo (Larry Brackney, NREL)

Cal TF should seek to understand assumptions that were made in developing DEER Building Prototypes and review. Based on NREL's work in transferring the DEER Building Prototypes from DOE 2.2 to EnergyPlus/Open Studio, NREL believes some of the assumptions do not reflect actual conditions and should be reviewed and reconsidered.

The analysis controller should be the technical analysis only. Any policy or other savings "deraters" should be separate from the Analysis Controller so that they are transparent.

Lighting (Ayad Al-Shaikh)

- LED Recessed Downlight
- Climate zone specific claims to match across the state
    - Did not include 2 commercial EULs in SDG&E work papers.
    - Stage 2: Methodology for keeping cost up to date: if they should vary by CZ, offering or delivery.
    - Cost difference between a downlight retrofit and kit. This is the fixture and 4.31 is the kit.

The goal is to have interactive effects table (building stock and climate zone) that isn't PA dependent. But we don't have supporting tables to dissect this data. Would need building stock weighing tables or HVAC. Could use 2014 building stock weighting table to do weighted average. Would be a little hard to follow. Or just average them.

Gary Fernstrom: There's a third approach: take a value that results in the least interactive effects since IE is overstated.

Cal TF Comment: This will affect appliance and water heating as well.
Probably fooling ourselves with false precision. Let's use the simplest approach now and if studies show it makes a difference, we can change it later.
Make investigating it a stage 2 issue?
Go forward with simple solution but investigate what a longer-term solution would look like.

- 4.26 LED MR-16
    - CZ specific claims need to match across the state.
    - Claims comparison based on ¾ of 2017 – there was too much going on in 2016 to use it.
- 4.27 LED PAR lamp
    - CZ specific claims need to match across the state.
- 4.28 LED Candelabra Lamp
    - DI is the culprit for cost issues.
- 4.29 LED Globe Lamp
    - 3 bins: <3W, FM, <3W, 3W to <=5W
- 4.30 LED A Lamp
    - CZ specific claims need to match across the state.
    - ½ way through 2017 the savings changed and all IOUs flipped over. Only used last part of 2017 savings.

- 4.32 LED R/BR Lamp
    - ED may not affirm unless all of the wattages are in there.
    - Want to affirm measure as it is to get into the eTRM.
    - Would additional measures be a stage 2 issue?
    - The additional measures are probably expired in DEER. What we affirm here won't take effect until 1/1/2018 so you may want to do something now.
- 4.36 LED T8 Replacement Lamp
    - SCE offering specifically.
    - CZ specific claims need to match across the state.
    - Lumen equivalency method would have made much more sense.
    - An LED tube can extend ballast life over a fluorescent tube. Lower heat in the ballast. Have also heard the opposite – being overdriven if they are not fully compatible. Good stage 2 issue.

Lighting Measure Affirmation

A majority of the Cal TF members in attendance confirmed that they agree with the lighting subcommittee recommendation to affirm the measures:

- Aye: 15 in the room 1 on the phone
- Nay: 0
- Abstain: 3 including Martin Vu who abstained because he worked on one of the measures.

Thank you for your patience and participation!