



Agenda

California Technical Forum (Cal TF) Meeting

July 23, 2020

Location: Teleconference Only

10:00 a.m. – 1:00 p.m.

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Time	Agenda Item	Discussion Leader(s)
10:00 - 10:15	Opening	Ayad Al-Shaikh
10:15 - 10:30	Draft Resolution E-5082 (DEER 2022) ACT: <ul style="list-style-type: none"> Informational only 	Ayad Al-Shaikh
10:30 - 11:15	GHG Memo Update ACT: <ul style="list-style-type: none"> Informational only 	Roger Baker

11:15 am – 11:30 am Break

Time	Agenda Item	Discussion Leader(s)
11:30 - 12:15	Draft: Cost Methodology Guidance White Paper ACT: <ul style="list-style-type: none"> Feedback requested 	Jennifer Holmes
12:15 - 12:55	Draft: Savings Methodology Guidance White Paper ACT: <ul style="list-style-type: none"> Feedback requested 	Ayad Al-Shaikh
12:55 - 1:00	Closing	Ayad Al-Shaikh



Meeting Materials

- **Meeting Decks**
 - Draft Resolution E-5082 Summary
 - GHG Memo
 - Cost Methodology Guidance
 - Savings Methodology Guidance

- **To Review / For Information**
 - Draft Savings Methodology Guidance Document (*draft in review by subcommittee, but available on Cal TF website*)
 - Draft Cost Methodology Guidance Document (*draft in review by subcommittee, but available on Cal TF website*)

Meeting Attendees

	<i>In-Person</i>	<i>Via Telephone</i>
<i>Cal TF Staff</i>		Ayad Al-Shaikh Cameron Assadian Chau Nguyen Jennifer Holmes Roger Baker Tomas Torres - Garcia
<i>Cal TF Members</i>		Abhijeet Pande Akhilesh Reddy Endurthy Alfredo Gutierrez Armen Saiyan Charles Ehrlich Chan Paek Christopher Rogers Dave Hanna Eduardo Reynoso Eric Noller George Beeler Greg Barker Jay Madden Jeff Seto Jonathan Pera Lacey Tan Lisa Gartland Marc Costa Martin Vu Mike Casey Randy Kwok Richard Ma Sepi Shahinfard



	<i>In-Person</i>	<i>Via Telephone</i>
		Spencer Lipp Steven Long Vrushali Mendon
<i>Non-Cal TF Members</i>		CPUC Amy Reardon / CPUC Peter Biermayer / CPUC CPUC Consultant Bing Tso / SBW Bob Ramirez / DNVGL Jonathan Taffel / DNVGL Rachel Murray / DNVGL IOU Adan Rosillo / PG&E Andres Fergadiotti / SCE Anders Danryd / SCG Gary Barsley / SCE Henry Liu / PG&E Implementer / 3P / Consultant James Hanna / Energy Solutions Jay Luboff / Jay Luboff Consulting Jeremy Sasse / RMS Consulting

Meeting Notes

I. Opening

Presenter: Ayad Al-Shaikh

II. Draft Resolution E-5082 (DEER 2022)

Presenter: Ayad Al-Shaikh

Materials: Cal TF Summary of E-5802 r2.pdf

III. GHG Memo Update

Presenter: Roger Baker

Materials: GHG slides_v5.0.pdf



George Beeler: (via chat) What about methane from fracking, well head, underground storage, etc.?

- Roger Baker: The report outlines what is included. They are not addressing leakage from out-of-state. I can send the last report that I have that was available through the 2020 calculator.
- George Beeler: It is important to consider from source to use.
- Roger Baker: Our goal is how to incorporate what the commission has approved; the opportunity to address where the data comes from belongs to another proceeding and needs to approach from another path. What is defined is addressed in proceeding.
- George Beeler: The GHG effect of methane is often looked at over the 100-year period, which is incorrect since it is in the atmosphere for about 20 years. Since the next 20 years are critical for climate change, I request that we ask for it to be the life of the gas and show the much higher effect that it is having.
- Roger Baker: This is outside of our scope, but it is certainly a topic we can discuss if this is an option.
- George Beeler: If we have opportunity to list the concerns that we have, it will carry more weight if Cal TF has a list of these topics we feel should be addressed.
- Abhijeet Pande: (via chat) I agree with George that we should have a say in this when feasible.
- Roger Baker: I can talk to Ayad on how to move that forward.

Armen Saiyan: (via chat) I recall seeing a note that the new ACC is considering Batteries as the cost of new entry. I wonder if that is also reflected in the marginal emission rates. If so the GHG projections may be far more reduced than reality where thermal generation peakers would likely be used.

- Abhijeet Pande: (via chat) Are you referring to this one - <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M340/K054/340054558.PDF> .
 - Armen Saiyan: I have not seen this document, just heard through word of mouth. Just curious if that same consideration is made from cost and GHG perspective.
- Armen Saiyan: Are the same assumptions being considered in terms of avoided cost being considered in GHG reduction. That may have implications on how GHG is being considered.
- Roger Baker: They are using no new DER scenario to try to address the avoided emission issue that falls into the calculation. What happens if no EE, distributed solar, storage, etc. in the next 20 years? We still include the essential plant battery, but I have not fully digested how the impact of battery affects the cost of entry. What is the in-depth analysis?



- Armen Saiyan: It is critical to understand comparison of the baseline scenarios. You may have multiple scenarios you can compare to and find which one is the appropriate one for critical decision point.
- Roger Baker: The eTRM should align what is being done through IRP process – the avoided cost chapter. I want to make sure we have full alignment between those 2 approaches and measures coming out of the eTRM can be relied upon to satisfy the reduction goal if that's part of the IRP process. I would like to find a way to align the POUs along with the IOUs in terms of the approach. Right now, it is easier to align the IOU avoided cost calculator, but the POUs have great different approaches.
- Armen Saiyan: Each POU determines what they consider. There might be some misalignment.
- Roger Baker: Not all the POUs have to file IRPs. Over time, POUs retiring generation relying on occasional/bilateral market (except the bigger POUs LADWP and SMUD) to satisfy load.

High-GWP Refrigerants

Jay Madden: How to incorporate refrigerant to eTRM? On the refrigerant side there is a parallel thing going on, the CA Air Resources Board (CARB) discussed yesterday their requirements for 2023 (or maybe 2022). We are starting to get to new requirements; although they were talking about larger systems (> 70lb of refrigerant) where the GWP requirements are going to be well constrained. Another moving part in this discussion, what rules will be new. Fuel substitution, CARB rules will apply.

- George Beeler:
 - 1. May we request including installation leakage when installing heat pumps? On an energy center online, I watched a demonstration on the installation, and they were commenting that, even though, CA has a severe fines on refrigerant leakage, there isn't any enforcement.
 - 2. Device types listed should be examined to be sure they include systems with increased leak potential for things like the number of refrigerant line field connections, etc. Mini Splits with multiple air handlers versus central AC. You can buy mini split at the local hardware stores and install these things yourself; they claim to have a quick connector for refrigerant, but you got to wonder how much leaking there is.
- George Beeler: (via chat) Since E3 found that 30% of GHG benefit of replacing gas furnaces with HPs is lost from leaking refrigerants. Should have penalty for adding AC to buildings that previously do not have it because of impact of summer duck curve.
- Roger Baker: I had 4 zone multi-split system at my house couple years ago and the technicians did not connect the fittings of the line properly. After about 8 months, the



system leaked out all its refrigerant. You are right that there is always a greater risk of leakage, especially with multi-split system vs unitary rooftop.

- Jay Madden: They are going to the extreme. They have units where the condenser is mounted on the wall opposite side of the indoor unit, where it is a quick connect (the thickness of the wall). The one thing I discussed offline with Roger is that the amount of leakage over and above when you would have AC anyway versus a heat pump. The reversing route of just having straight cooling with gas furnace, you still have that DX leakage.
- George Beeler: In CZ02 and CZ03 where cooling is not needed, replacing gas furnaces with heat pumps, you are actually adding cooling to buildings that didn't have nor needed one. We have that to worry about in CA. I am all for replacing natural gas, but the other issue is in the example I just gave, we are adding peak load that we did not have before.
- Jay Madden: I think Lacey Tan signed off. She is in favor of going over measures that replace heating only.
- George Beeler: There is tremendous discussion with the decarb group I am in regarding this topic.
- Abhijeet Pande: I agree with George. We worked on a number of issues around this. Another complication is that I do not think we can use existing building stock with and without AC. The primary concern with new construction and if you look at new construction trends with the changing weather, it is expecting that there is more cooling. It is more complicated than what exists now. There is a difference between replacing existing and building a new house.
- George Beeler: One thing we could do when that happens is to have people have shading on their west windows or have better window glass.

Next Step:

Abhijeet Pande: It is critical to align the data with the CZs. It is going to be hard to use central valley CO2 emission when the building is near the coast.

- Roger Baker: Avoided cost has been splitting up into these 2 zones. It may come down to where you are buying your power from rather than where you are located at. In central valley vs the coast, if your marginal power comes from Oakland, the CO2 is probably the same per hour based on generation, but your load profile is different.

Questions:

Roger Baker: Update IRP cycles.

- Armen Saiyan: I think SB350 kind of forces all utilities to do IRP cycle every year, which is reported to CEC.



- Roger Baker: Right now, there is a 2019 - 2020 cycle that is going on. It seems like they are doing every year. We may have to verify that.
- Roger Baker: Looking for feedback on what if utilities do not achieve the target for a given year.
- Armen Saiyan: That would depend on whether the metrics are being held to by certain goal. In terms of life cycle, it may not make a huge difference if we apply one year at a time.
- Steven Long: (via chat) Maybe multiple approaches will be required to ensure alignment?
- Jay Madden: (via chat) https://ww2.arb.ca.gov/our-work/programs/hfc-reduction-measures/meetings-workshops?utm_medium=email&utm_source=govdelivery
 - This is the link to California Air resources Board HFC reduction site. I cannot find the slide deck from their workshop yesterday.



Draft: Cost Methodology Guidance White Paper

Presenter: Jennifer Holmes

Materials: CalTF -Cost Methodology 07-2020 v1.pdf

Guideline 3: Data Sources and Analytical Methods

Marc Costa: (via chat) <https://www.csiresources.org/home> is where to start - they maintain the "CSI Master Format" which is how the construction industry categorizes bid information; it also aligns with some of the RSMMeans data; also <https://www.cmaanet.org/> and <https://www.agc.org/> are two common industry associations if we wanted to really get input from cost estimating experts

Guideline 7: Estimated costs should represent average of prices actually paid

Marc Costa: (via chat) Detailed projects costs are always collected in EE installation reports...is this data available to the TF?

- Jennifer Holmes: We will get to this in a later guideline. Also, Ayad mentioned that the DEER draft resolution touched on what data can be collected during implementation that can support cost analysis.

Guideline 10: Establish Trigger(s) for measure cost review

Marc Costa: (via chat) Although an unfortunate reality - project proposal costs in engineering estimates vary between installed costs based on ancillary equipment/omissions...for example a bucket truck for a street lighting project or demo/removal of obstructions to remove mechanical equipment...perhaps priorities can be looked at for measures with high confidence vs low confidence based on the delta between estimated and installed costs.

IV. Draft: Savings Methodology Guidance White Paper

Presenter: Ayad Al-Shaikh

Materials: CalTF -Savings Methodolo07-2020 v2.pdf

Materials reviewed. Comments for both savings and cost white paper were requested.