Agenda + Meeting Notes

California Technical Forum (Cal TF) Meeting

April 22, 2021
Location: Teleconference Only
10:00 a.m. – 12:00 noon
1:00 p.m. – 3:00 p.m.

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Time	Agenda Item	Discussion Leader(s)
10:00 - 10:10	**Opening**	Ayad Al-Shaikh
10:10 – 10:40	**eTRM Update** **ACT:** • Feedback and Comments	Jennifer Holmes
10:40 – 11:00	**POU Custom Measure Plan** **ACT:** • Feedback and Comments	Ayad Al-Shaikh
11:00 – 12:00	**New Measure Process** • New Measure Tools ○ What are they and how can you get them (*so you can share them!*) • New Measure Screening Committee Update • New Measure Types Memo	Stefano Galiasso Ayad Al-Shaikh

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12:00 noon – 1:00pm   Break

Time	Agenda Item	Discussion Leader(s)

1:00 – 1:55	**First Breakout Group**
	• Targeted measures (*Stefano*)
	  ○ https://global.gotomeeting.com/join/285461045
	
	• Procedural measures (*Ayad*)
	  ○ https://global.gotomeeting.com/join/156610101
	
	ACT:
	• Feedback and Comments
		Stefano Galiasso
		Ayad Al-Shaikh

2:00 – 3:00	**Second Breakout Group**
	• Measures with savings predominantly from software (*Stefano*)
	  ○ https://global.gotomeeting.com/join/285461045
	
	• Bundled EE measures (*Ayad*)
	  ○ https://global.gotomeeting.com/join/156610101
	
	ACT:
	• Feedback and Comments
		Stefano Galiasso
		Ayad Al-Shaikh

Meeting Materials

- **Meeting Decks**
  - eTRM Update (on Website)
  - POU Custom Measure Plan (on Website)
  - New Measure Process: Update and New Measure Types (emailed)

- **For Information**
  - New Measure Type Table (emailed)

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Meeting Attendees

	In-Person	*Via Telephone*
Cal TF Staff		Annette Beitel Ayad Al-Shaikh Chau Nguyen Jennifer Holmes Stefano Galiasso Tomas Torres-Garcia
Cal TF Members		Abhijeet Pande Alfredo Gutierrez Armen Saiyan Chan Paek Charles Ehrlich Christopher Rogers Dave Hanna Eduardo Reynoso Eric Noller Gary Fernstrom George Beeler Greg Barker Jay Madden Lisa Gartland Martin Vu Mike Casey Mudit Saxena Richard Ma Sepi Shahinfard Spencer Lipp Steven Long Tom Eckhart Vrushali Mendon
Non-Cal TF Members		CPUC Amy Reardon / CPUC CPUC Consultant Bing Tso / SBW Kerri-Ann Richard / DNV Rachel V. Murray / DNV

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	In-Person	*Via Telephone*
		IOU Anders Danryd / SCG Andres Fergadiotti / SCE Andres Marquez / SCG Ryan Cho / SCE Rod Houdyshel / SDG&E POU Bernie Perez / LADWP Implementer / 3P / Consultant Bryan Boyce / Energy Solution James Hanna / Energy Solution Jay Luboff / Jay Luboff Consulting Jeremy Sasse / RMS Energy Consulting Marc Costa / Energy Coalition Paul Kuck / Energy Solution Darren Nix / Ecology Action

Meeting Notes

I. eTRM Update

Presenter: Jennifer Holmes
Materials: eTRM update slides v2.pdf

Q2 2021 Activities: Additional Functionality

- Steven Long: What are the timelines for these?
  - These features will be available as part of v2.2 (released in July). Some features will need data populated first (like PA implementation IDs and a unique code for each measure, which is needed for the CET feature to work). All features should be populated by end of September.
- Mike Casey: CET is definitely a great feature.
  - Amy Reardon: This is an incredible accomplishment. I'm really grateful to the team for their amazing hard work on all this!

  - Ayad Al-Shaikh: If you have training requests for different use cases please put them on the chat or let us know.
- Mike Casey: Do you plan to have downloadable .pdf of workpaper?
  - Jennifer Holmes: The download button for the .pdf is on the Characterization page.

Q2 2021 Activities: Training & User Support / Q&A

- Amy Reardon: I am wondering what this group thinks might be the most valuable training topics? We should develop a list.
- Mudit Saxena: The live reference links are an excellent addition!
- Akhilesh Endurthy: Is there a notification when a new measure is added?
  - Notifications do exist, but there isn't a way yet to sign up for future measures. Something similar to this has been suggested as an enhancement.
- Mike Casey: This is already an incredibly useful tool and getting better. Great job.
- Mudit Saxena: I missed this - Are there YouTube videos with walkthroughs? If not, that would be very helpful - walk through a measure from searching to using the savings estimates
  - Amy Reardon: Agreed with the YouTube video idea!
  - Jennifer Holmes: To access the YouTube videos, go to http://www.caltf.org/etrm-overview the User Guide in eTRM will be visible to all users this summer.

II. POU Custom Measure Plan

Presenter: Ayad Al-Shaikh
Materials: CalTF Meeting - POU Custom Measure 4-20-2021.pdf

- Andres Fergadiotti: Is this custom approach only limited to LADWP. How is this integrated?
  - Ayad Al-Shaikh: This business plan goal is specifically for POUs. They have a specific custom process already that we can integrate to. Eventually, it could be broader, and we want other's feedbacks, including the IOUs.
  - Andres Fergadiotti: Is this IOU funded?
  - Ayad Al-Shaikh: The Cal TF is funded by 4 IOUs and 2 POUs. All business plan goals are split for different purposes. Most of the work is the eTRM and the eTRM is for statewide. This goal is initially for POUs.

- Akhilesh Endurthy: Is this custom integration approach like hybrid measures?
  - Ayad Al-Shaikh: It is not the same. A lot of the LAWPD custom measures, such as lighting, fall into the category of a blend between deemed and semi-deemed where some parameters are customizable. This is hybrid. Some other measures

are broader and specific custom measures. There are overlaps, but not the same.

Next Steps/Cal TF Input

- Eduardo Reynoso: Can we invite people outside the Cal TF or is this a closed meeting?
  - Ayad Al-Shaikh: This is open to everyone.
- Spencer Lipp: I am interested. I think to be most beneficial; we would want to have all the IOUs involved to make sure we have bought in as implementers would want to take these calculators and approaches to the PA's administering their programs

III. New Measure Process

Presenter: Ayad Al-Shaikh & Stefano Galiasso
Materials: CalTF Meeting – New Measure Intro 4-22-2021.pdf

Measure Types

- Martin Vu: Please add me to bundled and hybrid measures.
- George Beeler: Please include EV2BorG.

Framework Visual

- Gary Fernstrom: It would be useful to have a key explaining the color coding in term of importance.
  - Stefano Galiasso: It will be on the next slide.
- Martin Vu: Will new bundled measures account for non-EE direct benefits such as water savings, GHG emission reductions, flexible demand, solar generation, grid impacts, etc. into the current EE cost-effectiveness framework that generates TRC values?
  - Armen Saiyan: Agreed with Martin, more benefit streams need to be considered for non-EE measures. Of course this opens up a whole can of worms to adjust the Standard Practice Manual and CET frameworks
  - Stefano Galiasso: Not right now. That is something we could add in the future as it does pertain to the cost-effectiveness. As of now, we are not covering additional value stream as there probably be policy implications. We can capture it and recognize it, but we would need to update the policy first.
  - Annette Beitel: Martin and Armen, Cal TF Staff does not have control over value streams included in the CPUC CET TRC calculation. However, Cal TF Staff does believe there is benefit in calculating benefits you list above (GHG, water, etc.) at

the measure level in the eTRM so that if the CPUC decides to include the types of benefits you list above, we have values in the eTRM so they can be included if/when CPUC so directs
  - Armen Saiyan: Perhaps this can be ventured for POU measure considerations.
  - Martin Vu: Thanks Annette for your feedback. I think if bundled measures are being considered, that these other non-EE benefits need to be captured even though it is not claimed at this time similar to what is being done with the Water Energy Nexus tool.

Goals of Today

- Akhilesh Endurthy: Is there a list of measures that had went through or currently going through the screening committee and what are their status?
  - Ayad Al-Shaikh: We are currently developing a SharePoint site; I will send out an announcement when it is ready.

[ACTION ITEM] *Ayad Al-Shaikh to send notification to the Cal TF when SharePoint site for the new measure process is ready.*

IV. First Breakout Group

Presenter: Ayad Al-Shaikh & Stefano Galiasso
Materials: New+Measure+Types+table+04152021.xlsx

Targeted measures (*Stefano*)

Cost effectiveness issues

- Mike Casey: What do you mean by targeted?
  - Stefano Galiasso: Measures that are not cost effective, however, in certain circumstances these measures can be cost effective. We want to develop eligibility criteria so that if people want to use the measure, thee have to abide by the criteria which will allow the measure to be cost effective.

- Steven Long: Are you capturing program delivery? Sometimes net-to-gross is influenced by that.
  - Stefano Galiasso: I will make a note of that and address it.

- Spencer Lipp: Some sub-sectors may not have natural penetration, targeting these sub-sectors is what I think really needs to happen with these kinds of targeted measures. When we are talking about net savings, these two things go together.

- Charles Ehrlich: I agree with Spencer.

Data issues

- James Hanna: Program delivery mechanism is also affected; customer data might not be available.
  - Steven Long: Or the data type may not be helpful for different types of programs. Custom vs. mass market, you will get different data points for each one.

- Charles Ehrlich: It might be easy to think that because the measure exists there is already data there and the data collection requirements are the same, but if there is a new measure how would they present new data?
  - Stefano Galiasso: If it is a new measure, additional data requirements can be modified.

Market issues/Baseline Issues

- Steven Long: Targeting may be driven by other non-market issues.
  - Gary Fernstrom: Are we talking about the actual market or the market potential?
    - Gary Fernstrom: LED Chandeliers is a good example, no one was using them. Then we got involved and people began using them. With electrification, I think we will see more heat pumps in CA and there will be a need for thermal heat storage in the future. However, right now no one is using thermal heat storage.
  - Stefano Galiasso: I think it would be important to look at both, what is the market potential now and the market potential in the future.
- Mike Casey: Where would you find all the market data? We do not want to overburden the program developers.
  - Stefano Galiasso: Some of the data would be tough to get, looking at the data available and proving market potential is important.

- Gary Fernstrom: Who pays for the market study? They can be expensive, does the program developer pay?
  - Charles Ehrlich: I would encourage us to put parameters on what a market study would look like instead of trying to put a limit on time/period. We would not want to go back and spend time proving that old studies are still valid.
  - Spencer Lipp: If there is only one market study available from 2012, what is the measure proposer suppose to do if they are not expected to pay for it?
  - Gary Fernstrom: I think we need to think about the types of studies, there are a lot of different types of market studies. Market potential, market saturation, etc.

    - Stefano Galiasso: This might be an issue where we either want to drop or change the description of the issue. Maybe assessing the data is more important rather than trying to ask for certain types of market studies.

- Gary Fernstrom: Is there a guideline for what should be used? Codes and standards, ISP, etc.
    - Mike Casey: You often need a standard practice to have a new measure in place… consider separating codes and standards from standard practice.
    - Steven Long: The documentation requirements like delivery type could impact documentation needs.
    - Charles Ehrlich: Sometimes you have standard practice assessments that could influence the baseline.
    - Mike Casey: It seems to me in general that this is a bigger issue for custom measures and not deemed measures.
        - Stefano Galiasso: What about bundled measures?
    - Gary Fernstrom: I would rather have another call because it is good to hear from everyone else.

Procedural measures (*Ayad*)

- Akhilesh Endurthy: Can NMEC approach be a procedural measure?
    - Martin Vu: Modified lighting calculator too.
    - Ayad Al-Shaikh: There is value in agreeing upon a standardize process. The modified lighting calculator takes you to the hybrid world. You agree on the tools, the documentations, the imports, and even the savings. *NMEC could be procedural also; some of the larger program procedural measure use the RCT approach, which is similar.*

- Andres Fergadiotti: Are we limiting to open-source tool only?
    - Ayad Al-Shaikh: I do not think there is any restriction. However, proprietary tool/data is not preferable. The main goal is transparency, and this would be difficult with proprietary tool.
    - Annette Beitel: The eTRM software is open source. However, the information in the eTRM does not have any requirement to be open-source or proprietary. The CPUC owns all the information in the eTRM. However, if there is a proprietary tool the CPUC cannot own, then we will notify the commission beforehand to prevent any problem.

- Martin Vu: The 3 procedural measures – Home Energy Report, Universal Audit Tool, and Water Energy Nexus – have distinct nuances/challenges that migrated into this topic of procedural measures. It was very challenging to get these 3 measures off the ground and approved. NMEC is a great new one. The implementer is tasked to include this in their designed program. The CPUC did issued a NMEC procedure, but it would be helpful if the Cal TF can further provide guidance on capturing savings and other cost effectiveness parameters.

Cost Effectiveness - Impact on TRC

- Martin Vu: The WEN measure is combination of 16 different energy and water saving measures….
  - Ayad Al-Shaikh: Trying to get a sense of which TRC value you would get, mostly from the perspective of not restricting you. Most of the submitted measures so far came from experienced group, so guidance is not necessary yet. Sometimes, there is not a lot of thought that go into costs or lifecycle, which plays a big role in the final answer. Knowing where the measure may fall is good for providing feedback.

- Akhilesh Endurthy: Quick question - is 1 the highest score or is it 2?
  - Ayad Al-Shaikh: The range is 0 (not very important) to 2 (very important)

Cost Effectiveness - NTG

- Akhilesh Endurthy: NTG is part of TRC, so it is already part of the first check (if TRC is impacted)?
  - Ayad Al-Shaikh: That may the case. It would fall naturally with the first check.
- Lester Sapitula: For the Universal Audit Tool (UAT), there is a specified NTG. So it would be important to call out separately in case it is applicable in that context.

- Martin Vu: There is a DEER update on NTG or other cost effectiveness parameters. How does that impact the procedural measures for implementers to update their program design?
  - Ayad Al-Shaikh: We need to stay in the bound of what is allowable. It may be important to highlight what is going on outside if we think something is going to change. As right now, you would need to choose from the available NTG.
  - Annette Beitel: DEER resolution does annual update. The "New Measure Review Process" is another venue. If your data supports a different NTG, then you can submit a request for update form to the review committee for consideration.
  - Martin Vu: Thank you for the clarification. I know we're in a situation where we'll take the value today but is there a mechanism to allow a more updated number.
  - Armen Saiyan: Doesn't the Home Energy Report (HER) measure explain how the NTG will be derived?

  - Lester Sapitula: The RCT-default is the NTG for the HER measure. For UAT measure, I don't recall how the NTG was derived.
  - Martin Vu: DNVGL did a study for the UAT measure and selected that NTG.
  - Armen Saiyan: The placeholder was selected and the workpaper provides a method on how to deal with it.
  - Martin Vu: Hypothetically, the number was less than 1. From what Annette says, the "New Measure Review Process" would be a venue to propose a more relevant number.
  - Annette Beitel: If the CPUC did not mandate that the NTG has to be RCT, then it's fair game to propose an alternate value or even methodology. It's based on the cost and the time to do a Randomized Control Trial (RCT), which is high and high
  - Ayad Al-Shaikh: RCT is not required. It is what we see for the 2 measures, but it depends on scale.

Data Issues – Custom Program

- Martin Vu: Are the UAT and HER measure incentivized through custom?
  - Lester Sapitula: It is not claimed to custom. It is our residential program.
  - Martin Vu: It is a deemed measure. I think it was custom at one point and got transition to custom.
  - Ayad Al-Shaikh: The measure impact type is "cust-gen" for UAT and "cust-RCT" for HER. Officially, they are custom, but are handled through the deemed approach. The ExAnte Review team reviewed and approved this workpaper.

Data Issues – If continuous data collection

- Armen Saiyan: Are you asking what kind of data would be required when you submit a procedural measure? A procedural measure is a mean to get a measure through without the data requirement and the data can be filled out during the implementation.
  - Annette Beitel: That is a good perspective.
  - Ayad Al-Shaikh: Procedural measure is one that we would want to agree on as much as possible. Maybe we do not have to agree on how the data is collected, but if we leave too many things open, there is a danger of things being wrong.
  - Armen Saiyan: I mean we agree on how data is collected, but not necessarily require the data upfront like with a deemed paper. This would pave the way to get some implementation without having the data on hand.
  - Ayad Al-Shaikh: Yes. I think this is the power of procedural measure. It sounds like custom.
  - Armen Saiyan: I see procedural as locking down to a particular method versus custom looks at multiple allowable methods. Maybe you can agree on multiple

allowable methods, but that would complicate the paper. The effort would be providing the ideal methodology.
    - Ayad: I agree.

- Martin Vu: As implementer roll out programs and getting new measures adopted, what continuous data should they be getting. It would be helpful to have guidance regarding this in the measure screening process.
    - Annette Beitel: I would suggest, based on what Martin is implying, the importance of weighting costs and disturbance (to the customer, implementers, etc.) against the data quality. Part of the question needs to be is it worth it.
    - Martin Vu: Yes, that is what I mean. Here is a tangible example. An implementer in a mobile home area, capturing data to inform the workpaper because the current savings and/or NTG is lower than desirable. What information would be needed by this implementer, weighting the cost against the benefit?
    - Ayad Al-Shaikh: It would be valuable to have the saving methodology and key parameters guidance. It’s difficult to have too much more than the cost benefit analysis.
    - Annette Beitel: Your consideration on whether the data has a large impact on costs and savings. Another thing to consider is the customer and trade allies’ reaction because there is a lot of confidentiality and/or evasiveness issues. Customers may feel discourage from participating and trade allies may feel too burdened.

Market Issues

- Martin Vu: It is helpful to get the data upfront. In the “High Performance Conveyor Toaster” measure, the market data to capture quick service restaurant was very helpful to provide the market size and portfolio impact. The Emerging Technology (ET) does a decent job to screen out which activities they like to research on to help inform workpaper.
    - Armen Saiyan: Do you think getting the data upfront would be difficult and potentially a barrier?
    - Martin Vu: If you have access to decent secondary literature and/or connection with industry, then the information is easy to access. Some other venues may be harder to access due to proprietary data, especially on newer technology.
    - Armen Saiyan: Another source would be saturation service.
    - Ayad Al-Shaikh: Is this clear what type of information is acceptable? In term of the market size, measures that require ex-post data have lower penetration sometimes because of the frictions Annette mentioned earlier.
    - Armen Saiyan: I think we just need indicator of credible source. We did not discuss what is acceptable or not acceptable.

- Ayad Al-Shaikh: What about customer documenting the opportunities
- Armen Saiyan: That is probably a lot of work.

Market Issues: column I

- Martin Vu: There are companies, such as IBSI world, that do primary and secondary searches on national level. We can try to pair down to regional level. For food service, there are companies that target and have specialized reports on commercial food service technologies. They are fee-based. IOU has customer information, but that is confidential.
    - Ayad Al-Shaikh: Do you think these sources are also good for future market data?
    - Martin Vu: Kraft Analytics Group (KAGR) provides projections for future growth and accounts for world events, such as this pandemic. It is not perfect, but it's better than what we have right now.
    - Akhilesh Endurthy: Potential & Goals is another good source for this
    - Armen Saiyan: The LADWP is working on a tool that would give market potential value. It currently covers LA area, but can potentially expand to CA.
    - Armen Saiyan: FYI, Comstock is the NREL tool I was referring to. https://comstock.nrel.gov/ It has values for CA but I think the source of that data is based on CBECS which is a nationwide study (so CA specifics may not be good enough).

Market Issue – column J

- Martin Vu: One thing that we are having trouble within California is having CA-specific data. I am wondering how other jurisdictions handle non-regional data.
    - Annette Beitel: It is common in Illinois and other jurisdiction to use some other jurisdictions data and calibrate, if necessary, to validate parameters. I think it is appropriate as studies are expensive, so it's worth it establish a reasonable practice going forward.
    - Martin Vu: When I did secondary research and found studies that are relevant to that workpaper, but the feedback is always "well, it's not CA, so we have to do another study". That would be expensive and time consuming.
    - Annette Beitel: You should put in a follow up for the Cal TF to work on. When are non-jurisdiction studies are appropriate?
    - Andres Fergadiotti: What would constitute non-CA data to be applicable for CA and to follows EM&V protocols?
    - Annette Beitel: Many approved workpapers in the eTRM are based on small sample, non-CA EM&V procedures, so CA-data is not a criterion. Second, it

would be case-by-case when non-CA data is appropriate. For a weather sensitive measures, there is a case to pull studies from regions with similar climate (possibly normalizing the data for CA). It is not an absolute bar.
    - Andres Fergadiotti: There must be an agreement on what these cases are.
    - Annette Beitel: Absolutely. This can be a subcommittee. The East coast has done eTRM and the East coast constantly recycled non-jurisdiction study data.

[ACTION ITEM] *Market issues, CA data vs. non-CA data is a good topic for Subcommittee.*

V. Second Breakout Group

Presenter: Ayad Al-Shaikh & Stefano Galiasso
Materials: New+Measure+Types+table+04152021.xlsx

Measures with savings predominantly from software (Stefano)

Cost effectiveness issues

- Armen Saiyan: Can you clarify what this means?
    - Stefano Galiasso: Measures that are generating savings because of the software and not the hardware, AI or predictive analytics. That is the type of software measures that we will discuss.
    - Akhilesh Endurthy: The only measure that I can think of is smart thermostats, but why should the score be 0? I think a score of 1 would be more reasonable.
    - Stefano Galiasso: the reason why it is 0 is because it is not covered in every measure, only software-based measures.

- Charles Ehrlich: Some energy management software measures may be really expensive.
    - Armen Saiyan: Some of the ones that I have seen are subscription based and the up-front cost may not be expensive.
    - Stefano Galiasso: It is expensive today but, in the future, I think the cost effectiveness will be better.
    - Armen Saiyan: I think we need to separate the two. Software vs. hardware.
    - Stefano Galiasso: The hardware needs the software.

- Akhilesh Endurthy: These measures tend to have a low NTG and maybe energy alone might not be a motivating factor.

- Charles Ehrlich: Sometimes the names of the features are confusing, you do not realize they are part of code requirements than can make for low savings.

- Steven Long: I wonder if software has to be multi-functional or AI instead of standalone. I think it would be great to fully define it instead of leaving it up for interpretation.
    - Akhilesh Endurthy: I agree with Steven, we might need to move it to a score of 2 because the NTG is critical for these measures.
    - Steven Long: I am thinking of measures that are tough to categorize. Like integrated controls, might be similar to VFDs and I do not think those fall into this category.
    - Stefano Galiasso: I would have to think about it, I was thinking more purely software.

Data issues/Market issues

- Charles Ehrlich: Software measures are the type of measures that will allow you to collect data that has not been collected before, I think that there is a lot of opportunity here.
    - Steven Long: How do you define the software? You can say an automation system is software, but you can configure it certain ways where the savings will change. I agree that you should be able to get the data in an ideal case and it is an advantage, but it is not always easy to use.
    - Stefano Galiasso: The key to me, is the software making an intervention or is the human interacting with the software and making an intervention. Maybe we need to change the name to “Smart Software.”
    - Charles Ehrlich: Persistence can be an issue as well because software can be turned on and off.
    - Steven Long: Take into consideration frequent software changes, algorithms may change frequently.
- Mudit Saxena: What are you including in your definition of software and can you give some examples?
    - Stefano Galiasso: The definition now is smart software that is making decisions, for example, software that optimizes the building and generates savings.
    - Mudit Saxena: What about software like audit tools? That brings about savings by informing users about potential ways to save energy.
    - Stefano Galiasso: There might be some overlap, but the UAT, for example, is classified as a procedural measure so I do not think that it would fall into this category.

- Steven Long: Differentiating between software and the algorithms within the software. It is not that you only have smart thermostats but maybe the behaviors and the actions

that the software executes might be different depending on the types of thermostats/hardware.
    - Akhilesh Endurthy: Measures that are software based can be deemed.
    - Steven Long: How the software works might be different between technologies/hardware. I think that it is really tough to tell, might vary by delivery mechanism, and can be influenced by other factors.

- Stefano Galiasso: What about market studies? Do we feel like a market study on market potential would be short lived?
    - Steven Long: I do not think that the results will be good by the time that the study is completed. Software changes very frequently. The studies will be driven by price and it will probably be really hard to get the data depending on what the software is.
    - Mudit Saxena: It all depends on the amount of data that we can get and if it is accessible. If there is a lot, it can be easier to go deem, sometimes the data is not easy to interpret.
    - Akhilesh Endurthy: Compared to other measures getting the data might be easier. In some cases, could be more complex, interpreting the data can be a challenge, but in other ways you can get data that was not easily available before.
    - Stefano Galiasso: Yes, the developer might need to give you access to the data. That can be a challenge, I think it will be a measure specific issue.
    - Charles Ehrlich: I think software measures post an evaluation risk.

Bundled EE measures (Ayad)

- Gary Fernstrom: From policy point of view, we may be missing something if we just look at energy efficiency. Connectivity is another bundle where we get demand response benefit.
    - Ayad Al-Shaikh: Martin mentioned this too. We will document non-EE benefits.
    - Jay Luboff: I agree with Gary. Soon, we will have to do that even if it is in EE bucket right now.
    - Martin Vu: I think if we capture and even do not report it or claim it, I think it would be important. The collected data can support future program design. Implementers are asked to bring in innovation to the IOU 3rd party program, but they are constrained by the EE framework. The rigidity puts us at a disadvantage. We can capture it as a starting point until we can solve the policy.
    - Jay Luboff: I agree with Martin. The issue of flexible demand, peak, capacity, and ramping and part of that too.

- Ayad Al-Shaikh: It is worth pulling that one out. I do not want us to get loss. In the eTRM, we do have the non-energy impact placeholder.
- Annette Beitel: A broader question is what the parameters outside the EE framework are and how to quantify them. I agree with Martin and Jay that we want to lead policy if it is sound from a technical perspective. Cal TF can lead the charge if there is enough buy-ins. The commission signals that they want the clean energy to move away from individual approach. It aligns with the interest of the state.
- Jay Luboff: They are not non-energy benefits. They are energy benefits outside the DER framework.
- Annette Beitel: I will work with you offline on what the next step should be.

TRC: is looking at TRC important

- Abhijeet Pande: Perhaps have some 'co-benefits' added to EE measures to capture these additional energy benefits like duck curve impact etc. Separate from non-energy benefits.

- Martin Vu: As an example, there is a push to get the water energy savings. Right now, those savings are just reported. If you capture the embedded energy, it can make the measure more effective. Chaz (Charles Ehrlich) from PG&E last year mentioned that there are bundled EE and DR and if the DR portion does not capture it, then there is a way through the Cost Effectiveness Tool (CET) to capture the DR benefit for the TRC calculation. The increase TRC would appeal to an implementer when designing programs.
    - Gary Fernstrom: There are two kinds of demand response to demand impact benefit. One is inherent to energy efficiency and the other is on controllability/dispatch. In the cost effectiveness analysis, we estimate the demand reduction that is inherent in the technology (energy efficiency). If we add an additional control/dispatch, I am not sure how that can be added to the analysis other than simply being recognized.
    - Martin Vu: Chaz mentioned last year that we can, but I am also not aware.
    - Gary Fernstrom: I would also like to know how.
    - Jay Luboff: That is a problem for a lot of control related measure. We would need to come up with some averages or estimates.
    - Annette Beitel: In the utility world, a good analog would be interruptible rate. It is not just peak demand savings, but also be able to dispatch it. The utilities do have tariff for dispatchable load, and they calculate rate based on the value of dispatch. Starting with this paradigm would be a good place to start. The first question is whether it is already captured in the CET, which I highly doubt.

***[ACTION ITEM]** Follow up items: Types of energy elements that are not currently in DER framework.*

1. *What elements?*
2. *What approaches to quantify?*

Data issue

- Gary Fernstrom: I have a question how that work. A winery from fixed flow chiller to variable flow chiller. Simultaneously, they insulate the tank and pipe. Is that a bundled a measure? How do define bundling versus custom program?
    - Ayad Al-Shaikh: Your example could be a bundle due to the interactive effects. If the insulation reduces the cooling load, allowing the chiller to operate a higher efficiency. It is a good synergy here. There are those types of packages that have this synergy, plus additional benefits such as increase savings, decrease costs, or increase lifetime.
    - Gary Fernstrom: My recommendation is custom program ought to be integrated into bundled.
    - Ayad Al-Shaikh: We are proposing that bundle can be view through the deemed approach. The big picture is can we make it deemed.
    - Armen Saiyan: It probably can, and the combination is endless. There is a lot of work to determine the complementary measures for bundle vs just a by product of the project.
    - Ayad Al-Shaikh: Do you think it is easy to make the combination (variable chiller + tank and pipe insulation)? If we can drive a greater outtake, then it would be a good idea.
    - Gary Fernstrom: If it makes sense, then customer would likely do it all. It would add to the benefit of the program relative to the cost. On the VFD, let us add connectivity or dispatchability if it makes sense.
    - Spencer Lipp: The answer is its system specific. For example, it’s one compress air upgrade project that may include multiple measures (ex. flow control, tank storage, etc.). In the utility/incentive world, we are required to split it out the individual costs and savings
    - Ayad Al-Shaikh: There are some natural groupings, and should we target these first or target these last?
    - Spencer Lipp: Those are natural grouping, but currently, we as the EE industry requires to split them. We must have individual costs and TRC.
    - Annette Beitel: Would it be a value to the implementation if you do not have to split out costs/savings?

- Spencer Lipp: Absolutely. There used to be a compressed air system optimization as a measure where we can bundle. However, the bundling is not no longer allowed, and we have to break up the savings/costs. Retro-commissioning has bundle activities. NMEC tried to get there, but the policy required individual data and there is no way to unbundle the measure savings.
- Abhijeet Pande: Even in a simple case of a widget + control + operational measure (ex. lighting control). Right now, you cannot bundle this as each has its own internal logic (savings, costs, EUL, NTG, etc.). It would be a good to start at natural grouping of measures.

- Annette Beitel: What bundle would get residential or small business to net zero?
    - Mike Casey: How do you define net zero? Do you need to have on-site generation, or can you get credit somewhere else?
    - Annette Beitel: That is a question for the technical group. I would say you cannot get to net zero unless you have passive house design or on-site generation.
    - Abhijeet Pande: If you just focus on the energy side, and not renewable side, then may be getting an existing building to net zero. There is list of measures you will need, such as building window, insulation, and HVAC. The tricky point is that there may be several different packages. The question is do you define the approach as EE bundle or do you define a specific set of measures as a bundle.
    - Annette Beitel: What would be valuable from a customer's perspective?
    - Gary Fernstrom: The big question is what exactly is net zero. Is it just the electric load? Does it include space heating which may be gas?
    - Annette Beitel: This would be a great discussion point.
    - Abhijeet Pande: Back in 2012, there was a recommendation for a bundled C&E package.
    - Martin Vu: We have not made too much progress in that space. Right now, the mechanism to offer these programs to customer is EE. There are DR side load or self-gen side load. However, EE is still the main package even though it has low impact holistically. I think ET program has challenges to fund non-EE programs How do we move forward to a new era that would allow non-EE bundling and not constrain implementers.
    - Annette Beitel: There is the policy that procedural vehicle would be ideal proceeding. There is a value Cal TF can provide regarding this concern. If this group comes up with good strategies with good business rationale, then there is a way to change the policy. This is the approach that the CPUC wants to take.
    - Jay Luboff: If Cal TF does the analytic and makes it easy for the policy change, then we can break down the…
    - Gary Fernstrom: How does net zero address storage? I can overproduce in the day, underproduce at night, and net zero on the energy basis annually, monthly, hourly?

- Annette Beitel: On the customer's side of the meter, that would be fair game. Cal TF has power in the technical analytics as well as real world application from the customer size. The importance of socializing the different approaches across different stakeholders.
- Martin Vu: If we get field data, then there are implementers who have targeted these residential home and small businesses. They want to bundle these solutions, but there is no mechanism to do that now. Would this be the platform to socialize that?
- Annette Beitel: There would need to be a fuller discussion. I would refer to the new measure review process. It would be focal for the group to reach a strategic approach. What is the best test case to get the measure approved?
- Abhijeet Pande: I second that. If we can define the rule of the game, then the new measure process would be much better.
- Annette Beitel: This is not sandbagging the ExAnte Review team. They told us over a year ago that they are expecting a lot of new measure types. This aligned with what the commission staffs anticipated.
- Jay Luboff: We may set up a framework that look at different type of measures.
- Annette Beitel: I hear two separate exercises. One is what are the energy or non-energy benefits that are not being captured; this would be applicable to all measures. The second one is what are the best test cases are this bundle approach.
- Martin Vu: Getting the right test case would be tricky. Are the implementers ready to present their approach since we do not have an infrastructure in place now? How would the Cal TF provide the implementers a strategic direction to go about it?
- Annette Beitel: We do not want to be gate keeper. We want to give people a process that has a best chance of getting approve. However, we will not stop people from submitting their progress. We have a lot of brain power and experience in the measure review committee.
- Andres Fergadiotti: My concern with the bundle measure is that we may have to re-eval the savings and interactive effects.
- Annette Beitel: Don't measures with interactive effect have it already built into them? Do you think there would need to be new analysis?
- Andres Fergadiotti: That is what I am thinking.
- Armen Saiyan: Are you referring to the same exercise as the home energy upgrade?
- Andres Fergadiotti: Yes
- Annette Beitel: I would think to consider the cost of doing a new analysis versus taking what is already approved.

  - Andres Fergadiotti: I think you are talking about lighting interactive effects, but for HVAC, envelop, and etc., those would need different evaluation.
  - Annette Beitel: Yes, they all have interactive effects built-in in CA.
  - Armen Saiyan: Those are all derived through the home energy upgrade exercises Andres mentioned.
  - Annette Beitel: To my knowledge, all those measures already account for interactive effects, so I would say to use what is already approved, unless there is a compelling reason to spend resources for a new analysis.
  - Andres Fergadiotti: I think we may have to for new bundle case.
  - Annette Beitel: This would be another discussion point for the screening committee.

- George Beeler: I support the importance of EE packages for small retrofits! For example, with the strong push electrification changing from a NG furnace to HP adds cooling to buildings that do not need it...leading to people not sailing their buildings and adding huge summer peaks for AC. Solar shading and attic insulation should be added as part of the package.

- Armen: When you make a bundle offering, it is an all or nothing scenario. You must implement all the measures. The practical aspect of being able to scope in something versus having a flexibility in implementing.
  - Annette Beitel: That is a great idea. The bundling is to nudge customers to go for the whole package, so it is an all or nothing rule. If the practical reality is customer will not do the whole thing, then the group may have to offer different packages to accommodate.
  - Gary Fernstom: I think two different types of bundling. There is bundling on the custom side, such as washer + dryer combination. There is also bundling on our side, such as bundling the EE with DR.
  - Annette Beitel: Yes, there are two separate streams of questions.

Is measure in eTRM

- Mike Casey: May be the available equipment have changed since the existing measure was approved.
  - Gary Fernstrom: What would be an example of that?
  - Mike Casey: For lighting, the efficacy of LED lamp is approving all the time.
  - Martin Vu: What is the policy around disaggregating HVAC QI measures where you condensing coil cleaning being different than evaporating coil and air filter? The interactive effects of the added measures are not necessarily added.

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- Ayad Al-Shaikh: QI measures are good example of bundling where you would want to prevent double counting of savings.
- Andres Fergadiotti: We did evaluate the multiple treatments on the QI. That was one way we bundle all treatments into one set of savings.
- Armen Saiyan: This comes down to understand why there was that need to segregate claim values.
- Andres Fergadiotti: It may be easier for us to maintain dedicate measures where some measures realize a higher savings. Some programs, such as direct install, tend to bundle measures since it is more cost effective to deploy project under the same contractor. There may be other factor why you would choose bundle versus individual measures.
- Jay Luboff: The home upgrade program used to have a feature where you must choose at least 3 from a list of measures. It is a mix and match menu. I do not know how that would fit today.
- Andres Fergadiotti: That is a good example too with the bundle process. We would require three envelop measures.

- Eric Noller: We ought to build bundle specifically for industrial pumping system upgrade or industrial facilities with accommodation of two or more measures. That was done two years ago.
  - Ayad Al-Shaikh: That is a good example. In that example, do you see a place to drive more projects with bundle?
  - Eric Noller: The customers say they did not have specific things they want to pursue, but they want to improve the system. This is a system approach that can be broken down to different subset gears. Industrial system is different than commercial system, so you would want a different offering.
  - Ayad Al-Shaikh: Some industrial applications seem difficult to replicate a common bundle, as oppose to home energy upgrade. Did you think it is worth the effort or are there enough opportunities to develop that list?
  - Eric Noller: We can do a targeted audit on a system and new measure developers can evaluate the cost effectiveness. Overall, maybe we can bundle the not too cost-effective measures together to get better feedback. It can be left open for the customers to customize to their financial and operational criteria.
  - Annette Beitel: This sounds like a great model. Do you have workpaper you could share?
  - Eric Noller: There are technical code/guidelines that I can send over.
  - Ayad Al-Shaikh: Do you think the 3Ps would come up with a bundle? It seems like a lot of work for all CA but may be easy for a smaller market.
  - Eric Noller: Agree. The 3Ps are experts in their sector and they would have the knowledge of which measures are most appropriate for bundling.

- Bob Ramirez: Weighing in as myself NOT representing CPUC at all (and I hopped on late so disregard if not relevant): For packages of measures, consider using a billing analysis to develop the deemed savings value for the package OR if you do fully deemed-estimated values then need to ground-truth with a billing analysis of participants. Could start off by using the sum of per-measure deemed values but derate them for interactions or modeling the full package(s) and/or most common package options. But ideally billing analysis would be more likely to provide "best" estimate of savings for multiple interactive measures.

[ACTION ITEMS] *Follow-up inquiries:*

1. *What are good, bundled measure types?*
2. *Any prior examples?*
3. *Should bundled measure packages include "opt-out."*
4. *Do interactive effects need to be recalculated?*