DOCKETED

Docket Number:	17-IEPR-06
Project Title:	Doubling Energy Efficiency Savings
TN #:	219985
Document Title:	Transcript of 06/19/2017 IEPR Commissioner Workshop on Methodologies for SB 350 Energy Efficiency Target Setting
Description:	N/A
Filer:	Cody Goldthrite
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	6/30/2017 10:32:44 AM
Docketed Date:	6/30/2017

CALIFORNIA ENERGY COMMISSION

In the Matter of:	)	
	)	Docket No. 17-IEPR-06
IEPR Commissioner Workshop on	)	
Methodologies for SB 350 Energy	)	
Efficiency Target Setting	)	
	)	

CALIFORNIA ENERGY COMMISSION

ART ROSENFELD HEARING ROOM - FIRST FLOOR

1516 NINTH STREET

SACRAMENTO, CALIFORNIA

MONDAY, JUNE 19, 2017

10:00 A.M.

Reported by:

Gigi Lastra

APPEARANCES

ENERGY COMMISSION STAFF

Bryan Early, Advisor to Commissioner McAllister

Martha Brook, Advisor to Commissioner McAllister

PRESENTERS

Cynthia Rogers, Demand Analysis Office

Paula Gruendling, Senior Regulatory Analyst, CPUC

Mike Jaske, Energy Assesments Division

Elena Giyenko, Demand Analysis Office

David Jacot, Los Angeles Department of Water and Power

Richard Oberg, Sacramento Municipal Utility District

Brian Samuelson, Efficiency Division

AGENDA

P R O C E E D I N G S

10:03 A.M.

SACRAMENTO, CALIFORNIA, MONDAY, JUNE 19, 2017

MR. EARLY: Okay. I think we can probably get started if it's okay with everyone. My name is Bryan Early. I work as an advisor to Commissioner McAllister. Thank you for coming to this staff workshop to discuss methodology and the foundation of the SB 350, 2030 Energy Efficiency Saving Doubling Targets.

Just to go over quick logistical matters briefly. The restrooms are in the atrium, out the door and to your left. If there's an emergency and we need to evacuate, please follow staff to Roosevelt Park, which is across the street diagonal to the building.

As a reminder, this workshop is being broadcast through our WebEx Conferencing System. So parties should be aware that we are being recorded, and we'll post the audio recording of the -- of this workshop on our website after the transcript is available in about a month.

So, for those in the room who would like to make comments, I'd ask that you fill out blue cards and then bring them to Christine over here. Participants on WebEx will also be given the opportunity to comment. We would prefer, given the tight schedule for this morning, that we

take all public comment at the end of the workshop. That's our preference.

So materials for this meeting are available on the website, and written comments on today's topics are due June 5th -- sorry -- June 30th, obviously, at 5:00 p.m. The notice for this workshop explains the process for submitting written comments. So just briefly in terms of background, you know, as to what we're doing here today, obviously SB 350 directed the Energy Commission to establish targets that achieve accumulative doubling of energy efficiency savings based on the 2015 AAEE updated forecast and doing so is cost effective, feasible, and does not affect reliability.

In terms of workshops we've had so far, in July we had a workshop, 2016, talking about the data and analytical needs associated with establishing these targets. In January staff published a paper and had a workshop discussing the policy and timely framework that staff intended to follow in the implementation of these targets. In that workshop and paper, staff stated that they intended to adopt a 2030 energy efficiency savings doubling goal based on the doubling of AAEE and the 2015 forecast, which would not need to be change between now and 2030, but that staff would adopt sectoral savings targets in 2017 and every two years thereafter, which would be based on cost effective feasibility and reliability evaluations.

So, additional things that have happened, on May 9th, staff adopted a draft 2030 energy efficiency doubling goal, that 2030 line, with the source data attached. Thank you to those who commented on that document.

So the purpose of today's workshop is to discuss the methodology behind those sectoral targets, and staff will be publishing papers, two papers, based on the methodologies discussed today and July. So I think we can hand it over to Martha Brook from -- also from Commissioner McAllister's office, with the first presentation.

MS. BROOK: Good morning. Martha Brook here.

So I wanted to just clarify that we do want this to be a participatory workshop. So if you have any clarifying questions as we go, please come up to one of the mics at the table, and let's get those questions addressed as we go and then those more lengthy comments, as Bryan said, we can hopefully have a good amount of time at the end to hear those and talk with you about them.

How do I get to my slide deck? Okay. And then just another process, direction is if you're online and participating in our WebEx and you have a clarifying question as we go, please raise your hand in the WebEx forum, and Christine will meet you, and we'll get those questions addressed.

Okay. So I'm just here to clarify three parts of

our framework for the target setting that have been discussed here at the Energy Commission after that January 23rd, workshop that we had, and this will go into our -- the next version of a paper that you guys will have a chance to review shortly.

So, three things, and they're all about kind of what we mean by doubling the statewide energy efficiency in SB 350. One is that the legislation says by January 1, 2030, and so we're going to clarify what that means in our parlance, and then the second thing is how we're going to extrapolate the expected savings to 2030 since both the 2015 AAEE and the 2014, the earlier versions of the utility goals did not go all the way to 2030. So we're going to clarify how we're going to do that extrapolation, and then in this framework paper in January 23rd, we mentioned that we would be correcting 2014 AAEE, and we no longer intend to do that, and I'll explain why.

So since we're doing all this in terms of additional achievable energy efficiency that's included in our long-term demand forecast, we're using a demand forecasting framework, and in that framework, a year is a year's worth of energy consumption in the long-term demand forecast or, in this case, a year's worth of savings, and so a year's worth of savings in 2029 is -- is actually by January 1, 2030. And so, instead of going to 2030 in our

charts and tables, we're going to go to 2029, and we're explaining here and in the next version of the framework that we expect this to meet the intent of the legislation to set -- to accomplish the deadline by January 1, 2030.

The second clarification of the framework is in the January 23rd paper, we had this -- what we've been internally calling kind of a kinked line where we were adopting a three percent growth rate from 2025 to 2030 or 2023 or 4. For the POUs that ended earlier, it's a 2030. And we were questioning that ourselves internally because the -- the legislation asked us to use an annual growth rate for that extrapolation, and, you know, so the first version of our staff framework was, well, let's figure out what we've accomplished historically, and that was -- that was consistent with a three percent growth rate. That was our original set of assumptions, but then we challenged ourselves to think of the average annual growth rate as really just the average growth rate represented by the historical line of the 20 -- of the AAEE and the POU goals, and so now we're proposing that instead of adopting a three percent growth rate for that extrapolation, we're just going to do a linear trend of the data that we -- that was pointed out in the legislation for the doubling. And, as you can see in this -- in this slide, it results in all cases in a slightly or significantly higher set of goals by the end of

that planning period.

So the -- the lower lines is -- represents the three percent growth rate. The higher line's for natural gas, electricity, and BTUs in this case represents that linear trend of the -- of the historical savings.

And then, finally, in the framework paper we explained that we intended to do some corrections based on better information that had already been included in our long-term demand forecast where we -- you know, on purpose for our forecast, we review AAEE as it comes to us and we understand it, and we make changes as appropriate, and if there's a problem or an error, we correct it, and that's what we were intending to explain in an update to the framework. But then, again, internally we had discussions about the intent of the legislation, and so legally that the -- that SB 350 specifies the use of 2014 AAEE and that it -- the legislation did not direct us to correct it based on better information, and so what we're -- what we're saying now is that published 2014 AAEE and 2013 period goals times two is that statewide annual efficiency goal that we're drawing as the top line in all of the savings charts that we intend to publish and that all work now -- that was the -- that was the legislative direction, take those numbers, times it by two. That's what you're trying to achieve, but our goal and our work is actually to establish savings

targets that are cost effective, feasible, and protect healthy and safety, and that will -- we'll all be looking at that together to figure out if we've actually met that top line. We may exceed it in some -- in some areas. We may fall short, but our work is not figuring out what the times two math is, but our work is actually to establish cost effective and feasible savings targets.

And then, of course, we'll be comparing those targets to that statewide doubling goal, track progress, and provide recommendations over time. So we think this is really exactly what legislation directs us to do, and -- and we're clarifying our framework in the -- in this area.

I think that's all I have, but I did want to mention that the rest of today is really, as you can see from the agenda, split between utility rate payers versus efficiency savings and -- and all other sources of efficiency savings, and we're doing this on purpose so that we can really challenge ourselves and force ourselves to identify incremental savings that are not already happening and don't duplicate or overlap utility rate payer programs, codes and standards programs, and -- and, as you will hear today from staff, to make sure that we do a great job tracking and reporting and not duplicating or identifying savings that overlap each other, we're going to be separating codes and standards out of the utility rate payer

efficiency savings programs and -- and then, as you'll see, we are explicit about how we are kind of defending our assumptions about non-overlapping savings when we get to those additional non-utility potentials for savings, and I think that's all I have to say because we're going to hear more about that from staff next.

MR. EARLY: So next up we have staff presentations related to the methodologies behind assigning the portion of the savings targets to be achieved through rate payer funded activities, and first we have Cynthia Rogers with EAD.

MS. ROGERS: Good morning. I'm Cynthia Rogers from the Demand Analysis Office, and I will be talking about the IOU target setting process. There are four specific topics I will be talking about, the Energy Commission CPUC coordination, the CPUC Potential and Goal Study, the Integrated Distributed -- Distributed Energy Resources Proceeding, and, finally, the Energy Commission's Use of the CPUC Projections.

The Energy Commission has been coordinating with the CPUC on the savings projections for the IOUs as part of the SB 350 energy efficient target setting process. We've been meeting with them in person and on the phone and discussing what we will be doing. The Energy Commission is not making any substitute changes to these savings projections.

The CPUC has been working with Navigant Consulting on updating the latest potential and goal study which is titled "Energy Efficiency Potential and Goal Study for 2018 and Beyond." This study was released on June 15th, and the CPUC will be having a workshop to discuss this study tomorrow, June 20th, in San Francisco, starting at 12:30. Paula Gruendling, who will be presenting after me, is leading this workshop along with Navigant.

The new updated study includes multiple scenarios addressing alternative cost effectiveness perspectives and also includes changes to methodology to account for new legislative mandates such as AB 802, SB 350, and some recent CPUC decisions.

Some of the AB 802 changes include consideration of existing conditions baseline, expanded measures list, including measures that present stranded potential which can now be incented due to the change in code baseline policy, and a grow -- greater focus on gross savings, behavior, retrocommissioning and operational savings.

Some SB 350 changes include the new goals are not to be constrained based on past program performance. We'll be working towards the doubling of energy efficiency savings by 2030.

One of the CPUC decisions, Decision 1608019, that had some changes. The new 2018 goals are no longer gross

but are now net of free ridership, and also the new goals will also be cumulative.

The CPUC is expected to release a proposed decision at the end of August, and the goals should be adopted in September.

Integrated Distributed Energy Resources, the IDR proceeding is assessing a uniform cost effectiveness framework for all demand side resources such as energy efficiency, demand response, and distributed generation. The CPUC has been considering including the use of a greenhouse gas adder to be incorporated into the current avoided cost. A proposed decision is expected sometime this August.

The Energy Commission's use of the CPUC projections. The Energy Commission is making two non-substantive adjustments to the final CPUC saving projections for the IOUs. Because SB 350 uses 2015 as its base year, we will be adding years 2015, 2016, and 2017 to the 2018, 29 projections for the cumulative savings. We will also be excluding savings from most codes and standards effective after 2019 to avoid double counting with independent estimates by the efficiency division for future standard impacts.

Thank you. Any questions? Up next is Paula.

MS. GRUENDLING: Okay. So I'm Paula Gruendling.

I'm a senior regulatory analyst with the CPUC, and since you already touched a bunch of things that I was going to touch, so I don't even know why I'm here. But, anyway, you did a very good job.

But I'm just going to go a little bit about -- through the background of why we're doing this. Some of the main considerations in the 2018 and beyond update, since you touched, I'm going to talk briefly about the scenarios and the results and the comparison with the 2014 study, and I'm saying I'm going to touch on it briefly because we do have our technical workshop tomorrow, and, you know, there's going to be much more time to go in depth about the results and methods, but I just want to give, you know, a flavor of what's been released and also some of the many takeaways that we have that we got from at least this -- this study.

Was there a question on the phone or -- no. Okay.

So, for the background, you know we -- we do need to identify all cost effective energy efficiency and establish targets for electric and gas corporations, and also the rolling portfolio cycle schedule tells us that we need to do a biannual update to the utility goals, and this is what we're doing right now. So for the 2018 and beyond studies goals, we developed methods and we got input via the Demand Analysis Working Group, the DAWG. There were quite a few changes to the methods that we needed to do due to the

-- to SB 350 and AB 802 that I'm going to talk in brief, but also there were very unknowns. There were many unknowns in the -- in the questions that we had to answer. So, you know, it's good that everybody -- bear in mind that, you know, there's still a lot that we -- you know, kicking off in this version of the study, and we hopefully will be able to have a little bit more data and improved methods, you know, moving forward.

So last Thursday, June 15th, the draft study was released by a ruling. The -- on July 14 is the deadline for the formal comments and reply comments. The formal comments deadline is July 7th, and for -- for parties to provide comments, they actually need to be a party of the proceedings. So if anyone wants to submit comments, they need to go through the process of becoming a party, and if you have any questions, you can come and talk to me afterwards.

We are hoping -- the schedule is that we'll have an August proposed decision and a September adoption. That could be a little bit earlier, hopefully not later, but it will all depend on how the record develops. And, you know, just the process for adoption of the goals, we did release a study with several scenarios, but ultimately the Commission will consider the study and party comments on the record, and we'll adopt one set of goals. So, you know, the

scenario is we're here to help us inform or to understand how potential changes if it varies some -- some of the attributes in the study, but the goals will be one set, and we're doing that also just to make the job more difficult for here. You know, why make it easier?

So some of the considerations for -- that we had to take into account in 2018, as Cynthia, you know, said before, we had to consider a broader application of the existing conditions baseline, which we did. Increased consideration of behavior retrocommissioning and operational savings, we also included that in the -- in this.

Also consider normalized meter energy consumption and paper performance in terms -- especially in terms of whole building, and we -- we did consider that, and we discussed that with the DAWG, and, you know, so right now we're still in the early stages of those programs, but we -- we did take that into consideration as perhaps an additional way of implementing those -- those programs.

Of course, if the goals would not be -- could not be informed by previous studies, we did change the way we calibrated the savings this time, and we also came up with the scenarios and also had to consider doubling of energy efficiency to the extent possible.

Another, you know, big area of concern is the outcome and the discussions happening in the Integrated

Distributed Energy Resources Proceeding, the IDER, which informed some of the decisions for the scenarios and the potential and goals.

The proceeding is considering the uses of the Standard Practice Manual tests, all of them, and how -- the adequate uses and how to use those tests, and also we had a few staff proposals that were added to that record. One of them is for the use of the societal cost test and some of the inputs necessary, how to calculate some of the -- the inputs to support the societal cost test and also a greenhouse gas adder to account for the cost of implementing the 2030 GHG goals.

Right. So these are -- this is the summary of the scenarios that we are -- the drafts -- we're calling them draft scenarios that we included in the draft report. Basically what we -- we consider several different ways of going about it, and we landed on -- one scenario that he just has a screen for economic potential based on the TRC using the 2016 of what it costs and just the -- what average GHG costs that are included in the avoider cost. And that does not include any forecasts for accounting for the cost of meeting the 2030 goals.

And then we have two scenarios that vary based on a GHG adder that we are using to account for the cost of meeting the 2030 goals. One of them is a staff proposal

that came out in the IDR proceeding, and the other one is a proposal that came out in the comments on the IDR proceeding. The used different methods, and, of course, they generate different results. And then two variations of the PAC. The PAC does not use any adder to account for the 2030 goals, but one of the variations of the Program Administrative Cost is to add an aggressive program -- program implementation. So, additional incentives, a little bit more of them, you know, and an aggressive take on BROS engagement.

So really briefly -- I don't know how I'm doing on time. Okay. So I can go -- so, looking at the results for here electric, for the technical, economic, and market potential, looking at the TRC reference scenario and the PAC aggressive scenario, so the lowest and the highest ones. Technical potential shouldn't change. What you do see is a -- is a -- quite a change in the economic scenario because it's sensitive to the -- to the cost effectiveness test that we use. So the more aggressive or the more -- the less stringent cost effectiveness screen would mean that more measures are going to past the test and are going to be included in the economic potential, and -- and then the market potential reflects the -- the logic that we use to account for customer participation in the programs. It takes into account payback, EUL, and some finance

assumptions as well.

The interesting thing to notice is that technical and economic potential are instantaneous and doesn't take into account soft turnover. So they're by default much bigger than market potential because market potential does take into account the soft turnover.

Gas is a little bit different. You could see that not many measures pass the screen if you're just using the TRC without a GHG adder. But it changes quite a bit if you go to the PAC scenario.

Market potential also changes a little bit, and it was the same thing with the electric results because the PAC aggressive has -- assumes a great engagement on the utility program side, and we expect to have more uptake based on that.

In any event, for the gas, the interesting thing to notice on -- especially the PAC aggressive, is that the economic potential went up quite a bit, but the market potential still remain at a small percentage of it. It didn't go up as much because the -- the economic scenario, the economic potential might allow -- with, you know, a more aggressive cost effectiveness screening might allow for more measures to pass this screen, but when you get into the consumer decision making, those measures might still be quite expensive and, therefore, not be adopted as much by

the -- by the -- participants.

So those are some of the main takeaways from the -- from the study.

Right. So this is the -- just a snapshot on incremental statewide market potential for electricity. You could see from the gray line the biggest contribution we are expecting to be from codes and standards, and then after that, commercial -- the commercial sector is the one that has a highest contribution. Let's see. Residential, you know, also continue to be not -- not as much.

Let's see. For the commercial sector, the main measures contributing -- the main measures contributing to the potential are lighting, followed by HVAC, and for gas it would be HVAC, food services, and water heating. And we also see quite a bit of participation from whole building measures, and you can see the -- the brown one is the -- is a BROS that we believe was able to bump -- to get a bump in relation to the 2015 study, because we didn't include more measures.

And on the PAC aggressive, the relationship still continues the same, but you do see that there's quite a bit of contribution from the BROS measures because we did add not only additional to what we had in 2014 but in additional to our reference scenario, some measures that are still a little bit uncertain, but we believe they might have some

potential in the future. But still the majority of the savings are expected to come from codes and standards and commercial.

And this is a comment on the incremental potential from the standard measures. Based on the data that we have, the standard potential actually to not be as significant as we were expecting perhaps it to be. It sort of reflects about seven percent in the early years, and it goes down to about one percent in 2030, and the diminishing potential takes into account the -- the turnover. It takes into account that as you get people to upgrade their two code measures, then the potential -- that potential starts diminishing. And the measures that contribute most are HVAC and lighting. But, again, this is based on the data that we have right now. It doesn't mean that as we get more understanding of this portion of the market subsequent updates might not give us a different snapshot.

So brief comparison to 2015 study. We did model more measures this time. So we added 31 technologies on the residential, 51 on commercial, and we also added 23 technologies for the existing conditions modeling and then some brief comparisons in the market cumulative for the electricity. All scenarios but the PAC are higher than 2015 if you compared it in gross terms, but the -- but that relationship changes, and only the -- the TRC is lower for

electricity, and for the gas, all scenarios are lower than 2015 for short and long-term, with only the TRC staying below the 2015.

So, finally, just some takeaways. We -- we saw that there's lower market potential than previous studies if we are just using the traditional total recourse cost test without considering any ways of accounting for the costs of meeting the 2030 GHG goals.

The other thing is that those scenarios were developed based on potential policy changes to explore the alternatives to past studies and also to comply with SB 350. Also we noticed that the potential at least for now, with what we know, potentially -- potential from adoption of the existing conditions baseline was not really that significant.

Also codes and standards are significantly higher than the 2015 potential, and perhaps they might tend to go up as time goes on. And also the economic potential, we did notice some variation depending on the type of cost effectiveness screening that you did use. It -- it's more significant in the short term than in the long term.

And, finally, I think that for SB 350 goals, one thing to consider is that there might be limits to what the utilities can contribute to the doubling of the energy efficiency goals given that we have the restrictions of cost

effective feasibility and reliability. We do need to meet those conditions. So at some point we need to be realistic about what can be expected from rate payers. But, on the other hand, this is the first time that we're taking a lot of new policies into account and calculating potential, and as we go on with the updates, both of the potential study and the SB 350 target setting, we might be able to get more data and improve those forecasts.

So I think that we need to be mindful that there might be limits, but we should not now just completely accept, you know, that the utilities are limited in how they can contribute. I think that as we move on, we're going to get more information and perhaps better forecasts.

And I think this is it.

You can speak now, Willie.

WILLIE: Thanks, Paula, for the presentation. I just had a few questions since I done that study that you mentioned. Here in your charts you had BROS as one of the contributors of energy efficiency. Can you elaborate a little bit on what BROS are?

MS. GRUENDLING: Oh, the BROS, the BROS. They're Behavior Recognition and Operational Savings measures. So from changes in the way you -- you operate your equipment, how you engage with conservation and energy management tools and practices, and also if you improve your basic

maintenance of equipment and processes in -- in -- for commercial and industrial sector, as well as in the residential.

WILLIE: So that's different than the behavioral modification programs?

MS. GRUENDLING: Well, so far, the only behavior we had was residential behavior from the home energy reports. So we added quite a few different measures to the scope of the study.

WILLIE: Thank you.

MS. GRUENDLING: But it's along the same lines. We might just be referring to different types of measures and behavior changes.

WILLIE: Also you mentioned that, you know, the existing TRCs does not take into account the cost of implementation of, you know, new policy environmental goals, but my understanding is that, you know, the avoid cost being used now, they already include, you know, avoided, you know, RTS compliance --

MS. GRUENDLING: It does.

WILLIE: Some GS adders and so forth. So what additional compliance costs were added in terms of coming up with this new measure -- or avoided cost?

MS. GRUENDLING: The -- what we call the GHG abatement cost, like the cost of reducing GHG emissions

beyond 2020, because the avoided cost reflects the cap and trade prices, but those prices do not take into account the new goal -- the new 2030 goals, and that's what the GHG adder tries to capture.

WILLIE: Oh, okay. Thank you.

MS. GRUENDLING: No problem. Other questions?

MR. CHANGUS: Jonathan Changus with the Northern California Power Agency. I was just actually curious about the workshop tomorrow, where some of us could find information on that.

MS. GRUENDLING: Oh, yeah. So I can -- I can, yeah, talk to you offline, but, you know, just for everybody else on the phone, the -- the workshop is at the CPUC, 505 Van Ness, starts at 12:30, and in the Courtyard Room, and it's open to the public. You can show up and ask questions. We're going to be presenting the results of the study and also be giving more details on the methodology. And, yeah, so this is -- this is it.

MR. CHANGUS: Will there be a -- a WebEx participation or is --

MS. GRUENDLING: There will be a WebEx, and there will be remote participation. What I can perhaps do is see if there will be any way that we can share that information with the participants here, because we -- yeah. Then you'll be able to participate in person or remote.

MR. CHANGUS: Thank you.

MS. BROOK: Go ahead.

MR. FITZPATRICK: Hello. This is Howie Fitzpatrick from PG&E. Thank you, Paula and Cynthia. I have one question, and I don't know who it's for or if it's better for tomorrow. So let me know.

And, Cynthia, at the end of your presentation, you mentioned that codes and standards after 2019 weren't included. And, Paula, I saw on your presentation that the savings from codes and standards really starts to drop off after say 2021, and I guess I'm interested in why that -- why that is, because I imagine that codes and standards will continue to develop in some capacity after 2019.

MS. GRUENDLING: Sure. So for the scope of the potential and goals, we added only the 2019 Title 24 and a few appliance measures that I believe go all the way to 2023. The reason why we did that is because information beyond that starts getting a little bit uncertain, and we just wanted to keep the study to the information that we had a little bit more certainty. But the -- the continued projection for codes and standards is not being picked up by SB 350 targeting. So the CEC team is -- is doing that. So it's just a matter of scope, but we -- I agree with you, we do anticipate that codes and standards will continue to grow over time.

MR. FITZPATRICK: Thank you.

MS. GRUENDLING: Thank you.

MS. BROOK: Paula, I have one question. Martha Brook, Energy Commission. So I was sort of surprised that industrial and AG's sector stayed -- the savings kind of started low and -- relatively low and stayed relatively low compared to the others. Can you explain that just quickly? Is part of that because of BROS or is that --

MS. GRUENDLING: This one?

MS. BROOK: Yeah.

MS. GRUENDLING: Well, this is electric. I actually did not put the gas. The industrial sector is the one that contributes most for the gas savings. I just didn't add it here.

MS. BROOK: Okay. Thank you.

MS. GRUENDLING: So you will see that tomorrow.

MS. BROOK: Okay.

UNIDENTIFIED SPEAKER: I have a question. Moheb (phonetic) in RDC. Paula, you had a sentence about the limited ability of the IOUs to extract potential. Could you just explain that a little bit more?

MS. GRUENDLING: Well, we are -- we do have the cost effectiveness feasibility and reliability constraints, and it -- at the end of the day, we do need to take those limitations into account when we are calculating economic

potential and then market potential. So -- and that could also have to do with the way we define it. So other ways to define cost effectiveness, for instance, for other buckets of energy efficiency beyond the utilities might have a different -- might have a -- you know, a more unconstrained potential. So that's the only thing to take into account.

UNIDENTIFIED SPEAKER: Right. And you're defining cost effectiveness for utilities as everything under the economic potential line?

MS. GRUENDLING: Yeah.

UNIDENTIFIED SPEAKER: Okay. Thanks.

Mr. EARLY: Well, thank you, Paula, for coming up and giving us a preview. So, I mean, we will eventually be docketing this PowerPoint, but I don't think it's going to come in time for those of you who want to click on the hyperlink and actually get details on how to show up tomorrow. So I think probably the best way, if you do have detailed questions about the workshop tomorrow in San Francisco, you should probably find Paula today.

All right. Next speaker we have Mike Jaske.

MR. JASKE: Good morning. Mike Jaske with the Energy Assistance Division of the Energy Commission Staff.

So Paula's last formal slide mentioned a couple of different things that could be different in the future and then the discussion with some of you who have come up and

asked questions have raised other questions, and what I want to emphasize here at the outset before I get into the details of my presentation are that the two studies, the Navigant study that the PUC has paid for and the Navigant study that the Public Utilities has paid for were set in motion before we really fully understood where we were going with SB 350. So those studies basically are -- although Paula has described some methodological refinements, the scope of those studies is sort of the traditional energy efficiency measures. What I'm going to talk about are other things that SB 350 authorizes as ways to satisfy targets that were not assessed in those studies and are among the reasons why the Energy Commission is going to be in the forthcoming report and you've heard it already mentioned earlier this morning, that we're going to be repeating this target setting process biannually, quadra-annually, somewhere, some cycle so that we can bring new kinds of information to bear on this whole subject.

So three specific things that I'm going to talk about this morning, conservation voltage reduction, fuel substitution, and then a little bit about the need to expand reporting requirements.

So the first of those, conservation voltage reduction, is actually mentioned explicitly in the legislation as a compliance option. CVR has been around a

long time, several decades. In its modern form, typically got a secondary descriptor, Volt/VAR optimization, and that reflects a more sophisticated understanding of how we can implement these technologies, particularly in the context of distributed automation.

As far as the Energy Commission staff knows, only one California utility is actually implementing CVR/VVO at scale for their system. There's been a number of others that have conducted pilot projects. SMUD is one of those. Some others who are trying to sort out does it make sense for their system, does it make sense for subsets of their system where certain circuits and feeders meet certain criteria and perhaps there are others for which it's not cost effective.

So just for illustration for those of you not familiar with this, old style CVR is going to be shown by this schematic of two pole-top distribution systems. On the left-hand side is a simple current voltage sensor, sends that signal down to a little controller, and the controller -- actually, it's a capacitor bank. So there's a very localized reading of voltage and that is translated into some departure from ideal. That little stand-alone controller with very primitive logic triggers the capacitor bank discharge.

The one on the right-hand side has the same kind

of sensor, same simple measurement, same simple controller, but what it does is affect the operation of the voltage regulator. So this is sort of the 20, 30 years ago version of CVR actually implemented to some degree in a utility systems. What we're talking about now in terms of modern CVR or VVO is a much more sophisticated system. On the right-hand side, we have the same capacitor banks that could be switched or line voltage regulators, but this schematic is trying to illustrate that the context in which those are actuated is completely different than it used to be in the old days.

At the bottom of this schematic, it shows that certain of these equipment may actually be deployed at the substation level as opposed to the circuit and feeder level. All of the communication is happening in the context of a SCADA system where lots of information is known about the distribution system in realtime, and there's a whole set of modeling and control logic on the left-hand side of the schematic that puts the decisions to actuate voltage regulators or capacitor banks in the context of an actual model and a prediction of how the distribution system is performing in certain line segments.

So not only is -- in the modern version of CVR/VVO the system responding to realtime conditions, it's -- it may actually be triggered on the basis of projections of how the

system may be operating. And so that is obviously a whole different context than the old system.

You can probably see just by that chart and how I explained it that CVR/VVO is much more readily part of a whole distribution automation upgrade, and trying to do it on a stand-alone basis and charging off those costs just to CVR/VVO is going to make it seem more costly. If you can do these things -- multiple things together, then the certain common costs that can be charged off to each of several improvements, and that's the sort of complicated distribution pilot that SMUD conducted four or five years ago and I think perhaps the IOU's have been exploring that as well.

As I mentioned earlier, loading patterns on some feeders and maybe even whole substations may not justify deployment of CVR/VVO. And cost effectiveness can be radically affected by who is responsible for providing energy to the customer. The -- the utility is responsible for the package of distribution services as well as energy. Then, you know, the utility and sort of its bundled customers and that kind of regulatory construct can all collectively benefit. If the utility is only providing distribution services and there's some other entity like an ESP or CCA is providing the energy, then energy benefits don't accrue financially to the distribution utility, and

there's a whole different construct of figuring out whether this thing makes sense.

So there are a number of policy questions that will be laid out in a little more detail in the staff paper forthcoming, but here's just a flavor of them.

So is there additional research that's needed to determine whether various specific CVR/VVO technologies are cost effective, and, if so, in what sort of feeder configurations? Is there any kind of statutory direction or encouragement or even subsidy to encourage CVR/VVO deployment when it appears to be cost effective? How do we deal with this issue of it might be cost effective from a societal perspective, but you get down to the -- the bookkeeping of distribution utility, and it's not cost effective. How do we deal with that issue?

So we'll be highlighting these issues and I think -- essentially what is likely is that the Energy Commission's forthcoming final report is going to line up a number of follow-up issues and over the course of the next cycle, whether it's the next year or two or the next three or four, depending on how -- when we decide we're going to do a whole update, a target setting, we'll be proposing various activities, working with utilities and others to try to make progress in this area.

Okay. Second area, fuel substitution. So, just

to go back to the January framework paper, fuel substitution was defined to mean end use device shifts from natural gas to electricity and fuel switching to mean non-utility fuel shifting to electricity.

There were a lot of comment -- and, before I say about comment, staff's understanding of Public Resource Code 25310(a) excludes fuel switching. So a lot of comments in favor of transportation electrification, which is fine, but at least the way I read the legislation, transportation electrification isn't a mechanism to contribute to satisfying targets.

As we parse the language of 25310(d)(10), it requires both end user energy savings and net GHG emission reductions. So that's site energy savings and source GHG emission reductions, and this doesn't line up exactly with PUC's three-prong test, and so one of the going forward challenges is going to be working with the PUC to see if we can rationalize their traditional three-prong test and SB 350.

Now, of course, this is not a near term issue. It's something that can be studied at more length because no utility put forward a fuel substitution program because the potential studies we're working with are the traditional energy efficiency scope.

A little bit more about site energy saving. So to

have site energy savings, obviously the energy consumption of the replacement device driven by electricity has to be lower than that of the natural gas device. Everyone is talking about heat pumps, but heat pump performance is very important. How heat pumps actually operate in the duty cycles of water heating or other technologies is critical to determine whether there actually are going to be site savings and a lot of details about how to establish what the existing conditions are of the natural gas equipment that's being replaced and is existing conditions the right framework or is it code as a baseline assumption, et cetera.

On the mention of coming up with net GHG emissions reductions, staff is going to propose sort of a three-step process that we're going to be doing a within, without analysis on an hourly basis, looking at the penetration of electric fuel substitution measures. We're going to be doing that with production simulation models with the proper performance characteristics that renewable generation and a resource mix that matches up to end use customers that are going to be participating in a fuel substitution program, and we'll be laying this out in more detail in our forthcoming paper.

So this raises a lot of implementation questions at the policy level that Energy Commission and probably CPUC need to thrash through over a course of time. The first one

is should that resource mix that's being used to assess GHG savings be utility specific or statewide, should it be targeted to specific kinds of participating customers or general to a utility. What process should be used to develop minimum heat pump performance standards and the performance of displaced gas devices, of course, this question I mentioned before. What process should be used to reconcile PUC's three-prong test versus SB 350, and a complicated one that intersects with the fact that nearly all gas services buy IOUs, and there are about 20 percent of electricity consumption by POUs. So how -- whose going to get credit for the fuel substitution benefits from a GHG perspective, the gas utility losing mode or the electric utility gaining mode?

So the last part of my presentation, reporting requirements. This slide is just sort of a rundown of things as they exist. PUC Code 9505 and PRC 25310(b) establish what the POUs are expected to report to the Energy Commission. PUC Code section was refined a little bit. It talks about how the PUC goes about developing energy efficiency potential and that we're to coordinate in our 350 efforts. Clearly we are, but there's no statutory basis for any entity other than a utility to be reporting to the Energy Commission. And, as we'll get into Ryan Samuelson's presentation later today, to the extent that we foresee non-

utilities playing a role in generating energy efficiency savings and contributing to the -- the big doubling aspirational goal, how do we get information from those entities, and what kind of information is that going to be.

There are a couple very specific things that we are concerned about in the near term. As you know, 25310(e) requires the Energy Commission to biannually report to the legislature about progress, and when we do that, we're supposed to assess two particular things, impacts on disadvantaged communities and the effect of the savings by local service area on a seasonal and hourly basis. Both of these two things seem to require data that we are not now receiving from utilities. So we're going to have to pursue how we go about doing that.

Hourly impacts are important. That's not to say that utilities perhaps are not looking at this, but because the impact will be unique, at least at the aggregate level of utilities overall savings, even if some measures have profiles that are in common, we have to figure out how we get some kind of reporting from POUs that allows that unique profile for each utility to be developed to satisfy the legislation.

We aren't now getting that, and we don't -- at least the way we understand the Navigant model as it was implemented for POUs, that's not a feature of that model at

this time. So something new is going to be required.

In terms of savings for disadvantaged communities, clearly only utilities are knowledgeable about who their program participants are and are they part of how the Health and Safety Code defines disadvantaged communities. It seems to require tracking of program participants by zip code and then reporting that to the Energy Commission so that we can in turn aggregate it and report to the legislature.

We had a few discussions with selected utilities about this, and at least some seem to think that they can readily report savings segregated into, you know, certain zip codes and others that are not. So this may be something that is a slight burden on some utilities and others may have to do more work to get there.

Because the first reporting cycle of November 2019 is not all that far away, staff would like improved information from the larger of the POUs as soon as next spring, and so this is a pretty tight time frame. We're anticipating this is one of those collaborative efforts that we need to be putting into place starting this fall and not waiting perhaps even until the whole SB 350 report is completed. Eventually we may need some regulations to spell out these kind of requirements, but we can't move regulations that fast in the Energy Commission world. So we're going to have to have some kind of collaborative

effort initially.

And that's all I have. Are there any questions? Mr. Changus is back.

MR. CHANGUS: Jonathan Changus, Northern California Power Agency. I think just a logistical issue for considerations at the March 2018 report is going to be on programs that are concluding at the end of this month from many of the POUs. So getting a reporting mechanism in place to capture additional data on things that have already been completed is going to be a challenge unless they were preexisting for many POUs. So we can talk more about that and see what we can offer in the interim. 2019 is a more -- a more plausible one for a broader array of the POUs, and then just with regards to fuel substitution, I think there's a number of outstanding questions with regards to Title 24 and how it treats fuel substitution that may be inhibiting POU interests because I would say there are number of POUs that would like to move forward on that sooner rather than later. So very much would like the opportunity to work through some of those issues, agree that they can be addressed at a later time, but I do think there are folks who would like to move on that if we can address the codes and standards piece as well.

MR. JASKE: Just a quick response. I do recall you raising the building standards issue at a WebEx we had a

couple of months ago. I think it would be very helpful to receive a description of that issue or those issues, you know, as part of comments so that we can have something to share with management, Commissioner Rowe. So I encourage you to do that.

MR. CHANGUS: Yeah. I believe there were a number of POUs that actually submitted comments on that issue and some other stakeholders as well that have been in support of fuel substitution on that piece, and so we can definitely pull those together and resubmit once this -- here as well.

MS. BROOK: Yeah, if you think you've already put something in the docket, just point us to that. I do remember lots of fuel -- but if you could articulate, I mean, if there's any additional information needed, then absolutely.

MR. CHANGUS: I'm not a wizard at Office, but I cut and paste with the best of them.

MR. NIFROMENA: Hi, Luke -- Luke Nifromena (phonetic), with PG&E. Thanks for the presentation. I just had a question. You mentioned it sounded like forthcoming CVC research. Are they going to be doing research on fuel substitution? Is that part of the BS 350 goal setting process or is that a separate effort, and when would we expect to see something?

MR. JASKE: I think we're anticipating a process

that sort of lays out a number of specific issues, and one way I thought about doing that that might be very helpful is create some illustrative case studies of particular kinds of programs with specific, you know, end uses and measures so that we can, you know, grapple with the quantitative, you know, process and where analytic improvement is necessary to chase this down. So that's -- I think we're anticipating not doing research in the sense of something independent but some kind of collaborative effort with interested parties.

MS. BROOK: And this is Martha Brook. And just stay tuned, because we will also be talking about fuel substitution in the non-utility section of today's agenda, and it could be that Mike's -- Mike's suggestion is sort of applied to staff's work, right. So we are making initial estimates of the potential for fuel substitution, but they're going to be at first high level, and so ongoing we want to refine and collaborate with you, especially the -- you know, the balance between the gas and electric utility and who gets to count what and what's the right approach. We're going to be working at it for quite a while.

All right.

MR. NIFROMENA: Okay.

MS. BROOK: Does that make sense?

MR. NIFROMENA: All right. And so would this be part of the final report I guess that's submitted for the SB

350 target setting or is this --

MS. BROOK: Yeah. So today we will talk about fuel substitution. So, again -- so Mike's just kind of queuing up some initial issues that we're going to likely need your help with.

MR. NIFROMENA: Okay. Sounds good. Thanks.

MR. BARTHOLOMEW: Hi. Obadiah Bartholomew, just a quick question on the fuel switching comments you were making in allusion to transportation as being excluded, and I was curious actually about stationary applications that were non-regulated fuels or non-utility fuels. So diesel generators that could be electrified for agricultural or industrial mining type applications. Focus on your fuel switching --

MR. JASKE: I think the issue is PRC 25310(a). At least the way I understand it -- our legal staff has looked at it -- there is explicit reference to electricity replacing natural gas, and so it does not mention any other fuels, propane, transportation, you know, fuels. So that was the basis for the framework paper saying that transportation electrification or other fuel substitution outside of gas to electricity doesn't quality in the sense of satisfying targets established through this SB 350 process. It doesn't mean those might not be meritorious thing to be done, but not done in the context with

satisfying SB 350.

MR. BARTHOLOMEW: Thanks.

MR. TOTH: Good morning. My name is Phil Toth, Southern California Edison, and I have a few clarifying questions.

Mike, in a previous presentation you had -- and I want to clarify, this is an illustration chart, and it has three basic sections. It had an IOU/POU section, and then it had a doubling section, and then it had an unknown section up here, and then I hear from Paula -- good job presenting that -- about 2X -- about what 2X means, and it is strictly a doubling of 2014 AAEE. But in the chart, the illustration that you showed -- I want to be careful because that is what it was -- it had more than 2X built into that chart, and so I'd like to clarify that it is 2X of AEE 2014 numbers, not the 2015 update, and I think part of this has -- of your presentation here was that unknown part and where it's coming from.

So if you could please clarify the -- you know, what 2X means and in comparison to your chart, I'd appreciate it, Mike.

MR. JASKE: So the simplest way to respond to this question is to separate the 2X statewide goal from targets. The 2X statewide goal, I'll say it this way, and policy people may choose to express it another way, is an

aspirational goal. No entity is going to be asked to double their contribution to how it is we satisfy that goal. So in the terminology I believe that was used in the framework paper and those diagrams, there was a goal at the top of that chart which was not quite doubled, and Martha has explained this morning that we are going to exactly double AAEE, and we're not going to adjust it or trend it down out years. And then there's a whole series of wedges that, you know, sort of moved up toward -- or stacked up and, as you are suggesting, there was a big chunk at the top where the sum of all those wedges didn't meet the aspirational goal and, therefore, it was unknown how it is that aspirational goal could be satisfied.

So what we're doing in this cycle is essentially starting from the analyses that have been put forward by the two traditional energy efficiency potential studies, tweaking them a little bit to avoid double counting, and then introducing a series of independent analyses that are very first generational that our energy efficiency division staff and their consultant are going to be doing over -- and Bryan will explain later today where they are in that effort. When we next draw that kind of a chart, it may well continue to show, you know, an unknown zone that we can't identify how to accomplish the aspirational goal, but many of those new wedges will be pretty conceptual with the

magnitudes not very firm and the exact delivery mechanism that would actually cause that to happen pretty rough and not yet linked to an entity that in the framework paper we refer to as a responsible entity. So, namely, some program delivery agent who is actually going to be carrying out an effort to accomplish that particular little wedge.

Now, and, therefore, all of that I think translates into what we're saying more plainly perhaps today than we did in January is this SB 350 effort is going to be repeated over and over again, every two years maybe, every four years. The top aspirational goal line will get adopted once and for all because of the way we now are interpreting the statute, but all of the savings that are the wedges that come from individual entities will be re -- reviewed and reassessed periodically as -- and some things will move from speculative conceptual into, you know, a more firm status, and eventually we may actually have new entities other than utilities who are actually thought of as responsible for delivering on some kind of projected savings.

MR. TOTH: Thank you, Mike. I think you're right. I think the utilities by 2030 need to have 60 percent third party delivery so there will be other people delivering some of these EE measures that you're talking about.

I was pleasantly surprised to hear since AAEE has both codes and standards embedded in it as well as EE

savings, that the code and standards savings were going to be separated out, pleasantly surprised. I appreciate that.

And I believe and how the EE potential study works -- and correct me, Paula, that any -- not any -- the assumed increases in codes and standards are removed from the EE potential part for above code savings, and so when they go forward, it's not we're just removing codes and standards, but they're -- the two sides of the equation are being bounced because they're also removed from the EE potential savings. Is this correct?

MS. GRUENDLING: It's -- it's not that -- I think that we are -- there's just a limitation of the scope of the potential end goals in quantifying codes and standards. So, if I understood your question correctly, so a portion of it is going to be Navigant modeled as part of the potential end goals, and then whatever goes beyond what Navigant modeled is going to be modeled by (indiscernible 11:13:35) and NORESCO, and then you just add the two of them, and that's going to be the codes and standards contribution wedged for -- for the -- with the codes and standards wedge for the SB 350 targets.

In terms of utility goals, the codes and standards goals have always been separate from the utility goals. So they are -- you know, even though they've been modeled using the same -- not even the same model, but the same

contractor, they're separate. I don't know if I answered your question. Maybe I didn't understand your question.

MR. TOTH: No. You understand just fine. It was -- there's kind of three-prong. There's going to be proposed -- or thought of adoptions of codes and standards moving forward, and then there's going to be the codes and standards advocacy work which you've referred to, and then there's going to be the program piece, correct? And so the question then is so part of it's the CEC adoption and the Code and estimating when and what's going to be adopted in the Code in the future, and then the codes and standards advocacy piece and then a program. So the question that I had was more specific, and you did a great job of defining it, and that would be is the codes and standards advocacy piece going to be still part and parcel of the goals or is -- or is it going to be the EE programs? So I guess the question is we're taking out the adopted goals from -- the CUC adopted goals, and then we have an advocacy part for codes and standards and the EE program part.

So in this doubling are we talking just the EE program part is going to be part of the doubling? I'm not sure who should get this question.

MR. JASKE: I don't think that we would link either of those program specific analyses to doubling. Doubling only applies to establishing the aspirational goal.

Nothing that is one of the wedges I referred to that you first introduced in your question is necessarily going to be doubled. We have a stacking of a whole series of separate programmatic efforts, some utility program, some standard savings, PACE financing, you know, type programs and other things that are all collectively moving us up toward that aspirational doubling goal but no -- none of those existing wedges necessarily is going to be doubled as part of this process.

MR. TOTH: Great. Thank you for the clarification.

And I want to be clear. Edison does support the 350 process and doing what we can to doubling under the existing process. So my questions I don't want to be construed in any other kind of way. It's more -- my questions are more clarifying in my mind's eye what's going on.

My last question -- thank you for putting up with me -- had to do with stranded efficiency and in my mind's eye, it could be one of a couple of things. It could be the below code stuff. It could be the difference between economic potential and -- and achievable potential. So it could be many different things. I was wondering if somebody could clarify what is meant by stranded potential?

MS. GRUENDLING: The way we define stranded

potential in the potential end goals is any savings that were not -- savings from equipment that was not turning over because our policies for existing divisions baseline was a little bit more restrictive than now with AB 802. So we are looking at potential savings from equipment or buildings that now can be incented to code that perhaps were not as broadly incented before.

MR. TOTH: That's 802 related?

MS. GRUENDLING: Yeah.

MR. TOTH: Perfect.

MS. GRUENDLING: That's 802.

MR. TOTH: Thank you for clarifying. I appreciate that. Sorry for rambling on. Thank you.

MR. KELLY: This is Steven Kelly with the Independent Energy Producers Association, and, Mike, you might have just answered this. I'm not really certain, but I understand by statute the need to set what are kind of identified as aggressive goals in energy efficiency, and that's fine. The question I've always had is what's the relationship between this target setting and, for example, your demand forecasts which drive procurement in a lot of other different spheres? You might have just answered this, but could you walk me through how what you're doing here is going to affect the demand forecast?

MR. JASKE: Well, just to put things in context

maybe for other folks -- I think you understand this -- we have a two-part process at the Energy Commission. We have -- we're dealing with the forecast. We have a baseline forecast that has a somewhat conservative criteria for energy efficiency savings that are included in that forecast. Then we have an adjustment to that that we have called AAEE over a number of IEPR cycles, and that AAEE analysis is intended to reflect additional savings that should be taken into account in resource planning processes, transmission reliability studies, you know, whatever, and in -- initially in the context of responding to a legislative inquiry about coordination among the Energy Commission, PUC, and ISO, we established this terminology of a single forecast, and the -- all of the Energy -- all of the agencies were going to use that for planning purposes, and we have since refined that to clarify that there are specific combinations of Energy Commission forecasts and AAEE that are to be used in PUC resource planning and in ISO reliability studies. Now we have a single forecast set.

So the idea of AAEE is still there. It's related to but different than this discussion we've been having about aspirational goals and wedges. What will presumably happen over time is as we become more comfortable with additional wedges and their sort of conversion or -- no, evolution might be a better word -- evolution from a concept and an

initial quantification to an actual program delivery agent and a real programmatic effort and some more rigorous estimate of the savings, those things may eventually become part of AAEE used in -- to effect resource planning, but that's not where we are yet, and we haven't really even begun to have that discussion with PUC and the ISO.

MR. KELLY: Okay. So just to follow up, so the aspirational targets or the targets, the SB 350 EE targets, do not become the targets per se in any one of the scenarios that you're going to be doing in like IRP planning or the demand forecast, the achievable?

MR. JASKE: I think we're going to try to shift terminology here so that the top line, the doubling we're going to call a goal, and then targets are the estimated savings from the specific programmatic efforts of -- and maybe we'll keep using this terminology of responsible entities that surfaced in the framework paper, and only those things are -- or even some subset of those things will we consider part of AAEE and, therefore, be used in resource planning and reliability studies.

MR. KELLY: Thanks.

MR. D'ANG: Hi, Mike. Paul D'Ang (phonetic), Southern California Gas Company. I had a question on -- I guess more on fuel substitution. In the framework it indicated fuel substitution as substitution between the

regulated fuels. Is the CEC considering the case for the substitution between -- from electricity to natural gas in the analysis for fuel substitution? I guess that would be where I guess if the overall GHG -- if there's overall GHG reductions, would that -- would that case --

MR. JASKE: I don't -- I think that that's -- such a thing could satisfy the statutory language if it had both site energy savings and source GHG emission reduction.

MR. D'ANG: I think that may answer my second question, but if -- so if there is and you realized energy savings reductions from that other case, then that would count toward goals or efforts towards SB 350?

MR. JASKE: Well, I don't want to say --

MR. D'ANG: Or was --

MR. JASKE: -- yes or no today because what we're proposing is, you know, an effort to study this issue going forward. So that's a -- what you're bringing up is an expansion of the set of things that we would need to look into on a going forward basis, before the Energy Commission makes any kind of a final "determination" about what set of things actually satisfies SB 350 requirements, which I don't -- will not happen in this cycle. It would be, you know, over the course of the next couple of years or so.

MR. D'ANG: Thank you.

MS. BROOK: This is Martha Brook, Energy

Commission. I would say, though, this is a staff workshop on the methodology for the SB 350, and if you -- if you see that there's technologies or sectors or approaches that we're missing, like then please, please, please put it in the docket because likely we don't know. It's not that we -- it's not in the scope. It's that we don't know what these technologies are that save GHG and site energy and move from electricity to gas. So we would like your help with that.

MR. D'ANG: Thank you. Well, anything that we do come up with or anything that we have, we'll put that in written comments.

MS. BROOK: Great. Thank you.

MR. D'ANG: Thank you.

MR. JASKE: Right. And just to reiterate what Martha is saying, we do anticipate that the final Commission -- well, the draft Commission report will come out at the end of August, and the final Commission report will give some direction to staff to look into CVR and fuel substitution and so forth. So to the extent that we want that direction to be broad enough to encompass everything that, you know, is a real contender, you should give us comments along those lines now so that we can fold that into the draft and final report.

Anything else? Thank you.

MS. GRUENDLING: This is Paula Gruendling. Just one thing. For people who want to participate on the meeting tomorrow, I think that I forgot before. Sorry about that. The best way to get information is to go to the CPUC website and check the daily calendar. It's on the home page on the right-hand side. You just click on that link, and it's going to have the list of all the meetings, and then you have, you know, remote participation and address and all the details there as well.

MR. EARLY: Thank you, Paula, and than you, Mike. And I think we have one question on -- on WebEx. George, go ahead and speak.

MR. NESBIT: Hello?

MR. EARLY: Yes. You're on.

MR. NESBIT: I was hearing lots of beeping. George Nesbit (phonetic) hertz rater as well as building contractor.

On the issue of fuel switching, you mentioned having to have both site energy savings as well as source greenhouse gas emission savings. Now, in site energy, does that mean you're considering essentially that one them of gas is like 29 something kilowatt hours, in that sense, and what or where are values for source greenhouse gas emissions? Now, natural gas, obviously it has an emissions, but the electric grid varies depending on the source of the

electricity, and we have goals that are increasing in the renewable content, and then I probably have some follow-up questions based on what you say -- or in any case anyway.

MR. JASKE: Just to clarify, I believe you're talking about recall fuel substitution, not fuel switching. I'll try to use the right -- the terminology that we are so that we are communicating.

Yes, on a BTU basis, whatever is being substituted for has to be lower than -- or the -- the replacement technology has to be less BTU energy at site than that being replaced, and we do not have a specific GHG shorthand to offer to you at this point. What we have is that shorthand description of the process that was on one of my slides, and we think that that probably will take a considerable effort if we want to try to reduce it to a more simplistic thing that -- hertz rating or any other kind of program delivery agent can actually use, you know, in the field. So we're not anywhere near yet having a specific citation to give to you.

MR. NESBIT: Okay. So it would seem to me that even if a fuel swapping -- is that -- is that what you wanted me to say, fuel swapping?

MR. JASKE: Fuel substitution, fuel substitution.

MR. NESBIT: Fuel substitution. So if I'm switching from a natural gas furnace to a heat pump, while

it's -- it would be possible there is an increase in site energy, depending on what the value of the source energy greenhouse gas is for electricity, I've certainly seen information already and it's quite likely with where we're headed that we would have a reduced source of energy greenhouse gases, and that's what we're ultimately concerned about. You know, I mean, I've seen some figures from Cal ISO year to year, month to month, but what we really do need, one of the things we need for our Energy Code would be an hourly source energy greenhouse gas table like we have the time dependent value which we used for the Energy Code. It also seems that switching from propane to electricity has to be considered. It certainly -- in the Energy Code, propane, natural gas, and electricity are really the only recognized fuel resources, and for most -- for a lot of people, going from a propane say furnace or appliance to especially a heat pump or a water heater is going to have cost savings. So -- and then I guess in the Energy Code, because we use time dependent value, which I will call essentially an hourly time reduced rate, switching from natural gas to electricity tends to be a penalty, yet from a greenhouse gas, it might actually be -- it's actually probably a better route for us to go.

So it seems like we need an hourly greenhouse gas metric to look at things and reevaluate, and that's what

we're ultimately after.

MR. JASKE: I believe the method that the staff is proposing at the conceptual level will clearly involve AB 760 analysis. How it will be packaged into some or simplified to implementation remains to be seen. I don't think that we believe that propane counts. No matter how desirable you might think that is, it's not explicitly in the legislation. So if you're desirous of propane to electricity fuel substitution, the statutory change will be necessary.

MR. EARLY: Okay. Christine Tam, we're unmuting your line if you have a question.

MS. TAM: Hello. Can you hear me?

MR. EARLY: Yes, we can. Go ahead.

MS. TAM: Thank you. Hi. This is Christine Tam with City of Palo Alto Facilities. Thank you so much for this presentation. I have a question to Mike regarding that slide with a number of questions regarding further studies related to fuel substitution. This is the question regarding whether there will be such energy savings that depends on the actual heat pump performance and what baseline should be used to determine the savings.

I think if we're talking about water heating in particular, switching from gas water heater to a heat pump water heater, currently the CEC already has a prescriptive

pass for replacing gas water heater to heat pump water heater, and that's based on the Title 24 TDB methodology which actually -- actually is more bias towards gas appliances because of the way that it's restructured, and even with that bias to or favoring natural gas appliances, is still -- is still -- they're still saving from a cost basis for heat pump water heaters, assuming that there is some minimum energy factor that the heat pump water heater is -- is met.

So I -- I think the heat pump performance issue shouldn't be that big of a question. Clearly, depending on the climate zone, there are energy savings already demonstrated in the Title 24 proceeding, and if we're looking at just the site energy savings, we don't need to go with the very esoteric TB methodology.

And my follow-up question is because there are still so many questions that was raised in Mike Jaske's slide, I would like to find out what -- what the study -- what the steps -- next steps are and what the time line would be. In the case of Palo Alto, we are very keen on moving forward with electrification pilots and hopefully expanding the pilots to full programs, but we also want to know if we can cap those gas savings in our report -- energy efficient target report.

MS. TAM: Ms. Tam, I think the best way for you to

move this ball forward is to provide some comments on June 30th along these lines. We will try to see how those comments match up with the draft of our staff papers that are going to be released maybe about two weeks after that date, so middle of July or so. So if it's possible there's something that you can react to in yours or other folks comments at that very last tail end of the approval of these forthcoming papers, if it's not then sufficiently spelled out for you, you should be commenting on those papers, which I think is sometime in early August. I don't know that specific date, but it will be announced, and then further clarification could be spelled out in the draft Commission report which is supposed to come out at the end of August.

So that's probably the best way or this -- the specifics of how to go about this fuel substitution effort to get spelled out over the course of the next couple of months.

MS. TAM: Okay. Thank you.

MR. JASKE: You're welcome.

MR. EARLY: And did George Nesbit raise his hand again? Can we unmute George's line and see if there's another question? George, do you have a follow-up question? No. All right.

MR. NESBIT: Not -- I tried to put it down, but I don't think it let me.

MR. EARLY: Okay. All right. Your hand is down. Thank everyone.

So I think up next we have Elena Giyenko with EAD.

MS. GIYENKO: Good afternoon, everyone. I'm Elena Giyenko, Energy Commission specialist in the Assessments Division Demand Analysis Office. And, again, as you mentioned, as many previous presenters mentioned, please submit your comments in IEPR -- 17 IEPR 06 on the POU target setting process.

There are three main objectives of POU target setting discussion, and they are listed on the slide. The first one is providing an overview of how legislative direction has changed over time. I'm also going to be summarizing the results of the simulated Navigant potential study that was submitted in March. And, finally, I'm going to be discussing the adjustments to POU electricity savings projections for SB 350 purposes.

As many of you are aware, this is the third workshop on the subject matter, and according to the -- the framework paper that was released as a result of January 23rd workshop, I believe there are going to be at least one more workshop before the adoption of the targets at the business meeting in November.

As a result of previous workshops, the Energy Commission received many stakeholder comments that

identified two main concerns related to the interpretation of the legislative direction applicable to POU savings targets and the approach to doubling.

On one hand there is a concern that it would be unreasonable to require POUs to double their board approved targets because the approval lies on the shoulders of their boards, and on the second hand, the paper concluded that all utilities do more to achieve the statewide goal of doubling, and there's going to be, you know, businesses -- the legislative direction would not be accomplished.

So the issue of POU targets is very complicated, and, as many of you know, there is a legislative history on that. Basically there are two bills that -- previous bills that established the state board -- statewide targets. The first one, AB 2021, which was enacted into law in 2006 I believe by Schwarzenegger, and the bill states that all load serving entities will need to procure cost effective energy efficiency measures so the state can achieve the goal of total forecast electrical consumption by 10 percent over the next 10 years.

The second law, which is only applied to POUs, was enacted into law in 2013. It was AB 2027, amended POU target cycle to align more closely with the IEPR time line and consolidated the reporting requirements into a single section of the Public Utility Codes, making compliance

easier for the POUs.

I would also like to mention that AB 2021 actually established the previously mentioned Public Utilities Code to 5310 that we discussed extensively today. So SB 350 changed the -- you know, added additional requirements for the -- all entities, including the implementation mechanism that Mike Jaske mentioned in Section (d) of Public Utilities Code 25310.

So this Section (d) nonrestrictively identified 11 implementation mechanisms to achieve statewide doubling. Mike mentioned the CVR and fuel substitution. There's IOU programs, and, of course, there are programs for the POUs contribution that is listed here, and it says that programs of local publically owned utilities -- electrical utilities that will need to provide -- that are providing financial incentives, rebates, technical assistance and support to their customers to increase energy efficiency pursuant to Section 385.

So Section 385 is also known as public benefit charge in the POU world. There's similar section in -- for the IOU, and if you're -- it originated in 1996 and can be found in the Public Utility Code Article 8 for the POUs and it was Article 7 for the IOUs.

There are four buckets on how public benefit charge is distributed in POU programs, one of them being

cost effective demand site management services to promote energy efficiency and energy conservation. Another one is investments in renewable energy resources. The third one is research development and demonstration projects, and, finally, rate assistance for services provided for local low income electricity customers.

Unlike CPUC and IOU requirements, there's -- there was no updates to the POU public benefit program. There is no, you know, funding calculations, lower amounts or time lines. It's basically the POU prerogative to how they distribute their -- rate their collective money among those four buckets.

POU electricity savings programs are very similar to the IOUs incentives. POU customers receive cash rebates for efficient products, home building energy operates, loans and financing incentives and also educational and awareness advice.

POU programs are also similar to IOU programs, can aim at individual customers in power purchase transactions, but in case of larger POUs like SMUD and LADWP, they can be directed further upstream in larger customer market supply chains and encourage manufacturers, retailers, and contractors, builders, of course, to influence how customers choose building designs, operating methods and buy home appliances.

So this is for my first objective. This is the second objective of my presentation that -- I apologize for this chart being not as -- the font of these words are not as visible. So I will try my best to describe that.

This is a conceptual POU electricity resource assessment model. (indiscernible 11:47:04) provided the results of this model in March, and ELRAM estimates electricity savings and demand reduction projection as a function of projected electricity sales, and, as you can see, it's at the -- on the top of this -- of this chart. Then energy efficiency technology applied to that, and they -- they come up with the technical potential.

Technical potential drives this technology -- energy efficiency technology characteristics based on the DEER database or in case of POUs, TRM, also known as -- the words escape my mind -- Technical Resource Manual. Technical potential is the highest potential, and I believe Paula also covered the consumption part of it. So then it is considered to be all measures of efficiencies that can be applied to the base line end use consumption.

Economic potential is a smaller potential because it -- based on the cost effectiveness screening, and there are a number of tests that utilities perform. In California there is a Standard Practice Manual that many utilities use to assess economic potential.

The next step would be maximum market potential where all the market feasibility and customer choices are counted. So that's why the maximum potential is the smallest potential. Market potential also can be divided on the gross and net potential, and the differences are there, and I will be discussing them later.

I would like to also mention that, as you know, Navigant assisted CPUC to do the IU potential. Navigant also assisted CMUA and NCPA SCAPA members with POU potential study.

This slide shows the results of the 2018 2027 POU cumulative savings. I apologize again for the small font, but I -- I will try my best to explain it. As you can see, the cumulative projected savings in 2027 is right there, above 30,000 gigawatt hours. Economic potential is smaller. It's slightly above 25,000 gigawatt hours, and the market potential is -- is two lines of gross and net. They are slightly close to 6,000 gigawatts savings.

So historically, technical potential is, you know, the highest potential. Economic potential is roughly about 80 percent. This time around, for POUs economic potential was 84 percent of technical potential, and market potential is slightly -- less than a quarter of economic potential.

So this slide informs the targets for the POUs and, you know, POUs boards to adopt. What this slide

doesn't show is codes and standards projections. Navigant did come up with the codes and standards projections for individual POUs. However, the methodology was different, and even though the numbers are provided, they were not part of deciding is it going to be a part of the market potential or not.

Also there is -- I'm not sure if POUs run -- or at least they are not reporting on the results of codes and standards advocacy programs. But that does not mean that POUs do not use the projections from codes and standards. And, as you -- as I'm going to show later, some POUs decided to combine their codes and standards potential with their either gross market or net market to come up with higher targets. So this slide shows POU 10-year cumulative targets, and the three lines -- this chart shows POU cumulative targets grouped by POU size. The green line, this combined SMUD and LADWP targets which are the highest. The red line is midsize POUs, and this almost -- really hard to see it -- blue line, the smallest POUs, but the number of smallest POUs who did the potential study is about 25 of them. So that gives us a perspective of how much smaller POUs can achieve in regards to the targets.

Again, in 2027, the projection of POUs targets are very close to 8,000 gigawatt hours. It is bigger than their market -- gross market potential because of some POUs

decided to combine their market potential with codes and standards projections.

So this is my third objective of this presentation. Staff proposes basically three adjustments to POU targets. First of all, the framework paper stated that codes and standards should be non-utility target. Also there are some POUs who decided to use gross savings, not net savings, as the basis for their targets. And, finally, there is sort of a lifespan of targets per SB 350 projections. So the savings years are 2015 through 2029. The POU study was covering only 2018 through 2027.

Again, these are staff sort of recommendation and potential for the adjustments. Any comments on how these adjustments should be improved, please submit your comments in the docket by June 30th.

So the first adjustment, the codes and standards savings adjustment, as I mentioned, there are some POUs, there are 10 of them who decided to use codes and standards projections. Both the largest POUs, the LADWP and SMUD, use codes and standards as part of their targets. That's why their targets are higher. As I also mentioned, that the -- the attributable savings from POUs codes and standards advocacy work is not reported directly to the Energy Commission. However that, you know, can be improved in the future. And also staff proposes to count codes and

standards savings as non-utility targets. So that's the element of eliminating double counting.

Second adjustment is this net savings versus gross savings, and this is a -- also has a really interesting context historically. So POUs customers and, frankly, all final end users can, you know, be participant or non-participant of the program, energy efficiency savings program, and in the past and still to some day some POUs decide to use attribution theory to account for non-participants in energy efficiency programs. The two main concepts of this attribution theory is the concepts of free ridership and spillover.

In summary, net program impacts include adjustments for free ridership and spillover. It has relevance in cost effectiveness assessments because financial incentives paid to free riders cost if cost effectiveness test exclude participant impacts, and there is no benefit from free riders because they are not paying or -- you know, to participate.

The concept of spillover means that participants didn't participate directly. There is no cost, but there are many benefits in all five standard practice manual tests.

Individual POU decision to use gross or net savings are mismatched. Navigant potential model provided

savings as -- on a gross and net basis. However, LADWP Anaheim and City of Burbank gross and net savings are the same. So we would need to -- we would need to have a gross factor from these three entities to adjust for net savings. I mean, there's other alternatives to use previous sort of assessments of net to gross, and we can apply that too.

The final adjustment is this lifespan of targets. POUs provided savings projections starting in 2018 and ending in 2027. SB 350 uses 2015 as a start year for doubling. POU actually report annually energy savings in 2015 and 2016 data is available. As far as estimates for 2017, they're not reported yet, but -- in the same format as historic savings, but there are options on how to calculate them. There are basically three options. One would be assume the same performance as the past year or use goals that were established in 2013 and just use the 2017 years as approximate for savings that can occur in 2017 or the third option can be a combination of both, sort of look at the historic savings and the goal and come up with a number which is reasonable to be included.

Again, this is a proposal. If there is a better way to account for 2017 savings, I would like to hear your comments and recommendations in the docket.

SB 350 requires doubling to occur by January 1st, 2030, and staff proposes a one-year extension of these last

two years, 2025 through 2027, to commute savings out through the end of 2029. If savings are slowing later than the last additional cumulative savings, it will be added in the final years.

So this is -- this table is a snap of top 16 POUs and which one needs to get their projections from the Navigant study to be adjusted. So, as you can see, the -- the targets, for example, for LADWP was based on the market gross potential and codes and standards projection.

This is a graphic showing what staff did to adjust POU targets. This -- the blue line here that starts in 2018 and ends in 2027 shows POU proposed targets. I would like to mention that some POUs boards have already adopted their targets. Some are still waiting for adoption. The red line that -- you know, that drops from the blue line shows the adjustments for codes and standards, basically those 10 POUs that I mentioned before who are not counting codes and standards in those 10 POUs. And, finally, the green line here -- not finally, but this is the third -- second step. Gross adjustment, net adjustment from the gross potential. The purple line over here is a final line that shows -- that starts in 2015 and ends in 2030, shows all three adjustments taking place. And, as you can see, there's, you know, slightly drop from the POU targets, and the majority of this drop comes from the largest -- two largest POUs, SMUD and

LADWP.

So this chart is showing incremental electricity targets, also grouped by three, the largest, the medium size, and the small ones. There's the -- dark red is -- are the targets for the 25 smallest POUs in the state. This -- the pinkish color is the annual savings targets for the 14 midsize POUs who are part of the integrated resource group, and the -- the majority of savings are in SMUD and LADWP area.

Again, these targets, some POUs have adopted the targets. Some POUs are in the process of adopting these targets.

So this chart shows the -- what's going to happen if staff decides to use these three adjustments. So the years are 15 years starting in 2015, ending in 2030. There is a drop roughly about 2,000 gigawatt hours, and, again, it's because of the LADWP and SMUD, excluding those codes and standards savings and adjusting for net.

So POUs will be revising their savings targets in four years. Basically the Energy Commission expects the new potential study in 2021. There's still discussion to be held on -- you know, they're to use the existing baseline or to code baseline as the benchmark for POUs programs, also how to account for savings from POU advocacy in Title 24 building standards and how to quantify the impacts of local

(indiscernible 12:04:59) because there are some POUs that are very progressive, and they actually have local codes that are above the state or the federal level.

So I'd like to conclude that the Energy Commission staff will continue collaborating with POUs to find projections for using SB 350 energy efficiency contacts, and I would like to answer any of your questions.

MR. GOETZ: Thank you, Elena. Brian Goetz, Southern California Public Power Authority. A couple of things. Your recommendation there at the end is inconsistent or a little different than what was in Martha's presentation when the first proposal was to use the 2013 forecast, and now we're -- I'm correct in assuming that you are looking to use the 2017 forecast that we just did this year. Is that correct?

MS. GIYENKO: So I --

MS. BROOK: Do you want me to start and then --

MS. GIYENKO: So I would like to restate again that the framework paper was issued before the -- before March '15. So there was no projections for beyond, you know, 2017 or, you know, the -- what the Navigant results were. So -- and, again, we are looking for POUs as a (indiscernible `12:06:38). So we're not necessarily, you know, contradicting what the board's going to be adopting for individual POUs. We're just looking how, you know, we

can achieve, you know, sort of the -- the number, the hard line of the doubling of AAEE in 2014, you know, demand forecast.

MR. GOETZ: Understood. So I just wanted to confirm that in addition for the AAEE for the IOUs, now instead of the 2013 forecasts, you're going to be moving to the 2017 forecasts?

MS. BROOK: Right. So the difference is that that top line, like Mike said earlier, we're establishing that in our adoption of the SB 350, you know, targets as a non-changing line, as the top goal. But absolutely when we're building up the targets, the wedges that stack up to that line, latest and greatest information, that's what we're trying to -- trying to include there. There would be no reason for us to go back and use a historical version of what you've already updated in 2017.

MR. GOETZ: Understood. Thank you.

MS. BROOK: Okay.

MR. GOETZ: Regarding the net to gross issue, this is probably going to be a theoretical or analytical difference of opinion, but the utilities that are claiming net and gross equally are of the -- basically of the consideration that impacts on the grid from energy efficiency, it doesn't matter if it was a free rider or if it was spillover, ultimately, if there's energy efficiency

savings from a measure or a program, then that should be attributed and accounted for. It doesn't matter why it's happening. So you are correct that, you know, the use of rate payer funds is an important consideration, but ultimately the energy savings impact the grid, and they benefit the utility. And so this is going to be a consideration that we're going to have probably some pretty big discussions because the two largest utilities in the POU world are both taking that approach, and many of the mid sized are also.

So we're going to need to consider this in the long term very -- very closely I think.

MS. GIYENKO: Right. So just I would like to note thank you for your comment, and, again, this is just, you know, a proposal for the adjustment, and the reason for the adjustment was that POUs targets are mismatched. So it was decided that the IOUs will use net savings, as Paula mentioned before.

So, again, POUs can do doubling or tripling of their targets. That's fine. But for the statewide purposes, we need to consider this cost effective, feasible, and beneficial to the public health and safety sort of screening, and that's why, you know, we're considering to having all utility savings to be on a net basis.

MR. GOETZ: Understood. Thank you. And I don't

want to speak on -- go ahead.

MS. GIYENKO: And also Navigant actually calculated net savings for pretty much all but three POUs, and that's why we're -- you know, we were not coming up with our own numbers for that. We used the Navigant study.

MR. GOETZ: Those three could be problematic to come up with a number.

MS. GIYENKO: LADWP is the largest, and I do hope that David Jacot will, you know, help us to figure this out.

MR. GOETZ: I'm not going to speak on David's behalf thank you.

Last question or last comment that I would like to bring up is codes and standards, and you need to recognize that I understand why you're pointing out the codes and standards, because that will be consistent across the POUs, and that makes fully -- you know, good sense. I have got no problem with that. However, the is a consideration that a lot of people aren't considering with codes and standards is that most of the POUs are enforcing codes and standards at the local building level and, you know, code enforcement. So even if not all the IOUs -- you know, you talked about how you're going to attribute the -- or the crediting of codes and standards for POUs, that is a strong consideration that a lot of people don't take into effect, that the small cities like the Biggs or the Bannings of the world, they

might not have a couple of extra hundred thousand dollars to throw at paying for codes and standards studies. But, in fact, they've got people on staff who are enforcing those codes and standards every day of the year. So -- and that has never been accounted for or attributed. And so that's just another consideration that, you know, we'll include in our comments going forward.

MS. GIYENKO: Yeah. That is fine. I would like to mention that in CMUA March 15 reports, the codes and standards savings were not part prior to 2013. So if there are any -- if there are any specific programs or savings that are actually occurring from codes and standards in POU territory, it should be reported to the Energy Commission.

MR. GOETZ: Understood. Thank you.

MR. CHANGUS: Jonathan Changus, NCPA, recognizing we're now eating into our own public power with the time, just another explanation I guess on some of the codes and standards, but is that unlike the IOUs that do fully fund and invest in the codes and standards process, that's not historically been the case for POUs. There's no obligation on them to do so. LADWP and SMUD have spent some time. There are additional utilities that are looking to engage because codes and standards are going to be such a central part of where savings are going to be derived from going forward, and so that's part of the reason you haven't seen

as much in previous reports. That's changing. We have started to call out in the annual report codes and standards investments. We did not for the first time this year. We're going to adjust that going forward so that it's just not a single line item because there is a variety of activities associated with codes and standards, including I'd say the most common one is the reach codes and local building codes that go beyond Title 24, and that is an area where there have been a number of POUs over the years. So we will continue to look forward to clarifying what that role looks like because it is, as Brian noted, quite a bit different in some instances than the IOUs.

MS. GIYENKO: Thank you.

Any more comments? All right.

MR. EARLY: Okay. Thank you. So next up we have David Jacot from L.A.

MR. JACOT: Good morning everyone. I have also brought Arman Sion (phonetic) of my engineering team who will be adding some technical information as we get to some of the slides.

So thank everyone. Thanks to the CEC for graciously inviting us to share our perspective on what we're doing with energy efficiency. Pretty wide ranging presentation I've got. We had a great call, coordinating call with Elena a couple of weeks ago to do some brain

storming on what she thought it would be beneficial for this group to hear. So it might be a little bit scattershot, but it covers a lot. So let's go ahead and get into it.

Very briefly, I'm going to put the perspective around DWP's aggressive investment in energy efficiency, been going on for about five years now. We have a lot going on, a lot of -- we're getting off coal. It's still too much of our power supply. Transportation electrification is coming and potentially driving up load significantly, and there's other things that are driving load and increased consumption. With -- in the middle of that, trying to get off of coal, obviously we're cutting out what's about a third of our power supply. So we're going to make that up, but natural gas is a bridge fuel. Renewables, of course, 50 percent by 2030. Senator Deleon's pushing for 100 percent by 2045. And so energy efficiency takes on heightened importance in this -- in this type of environment because there's a lot coming together at once in terms of driving load, losing supply, and how we actually balance that system.

We've been at it pretty much in earnest since about 2012, 2013. We've had energy efficiency programs since the '90s but with fluctuating levels of commitment, but we really got serious back in around 2012, and we got a 10-year plan out through 2020 to achieve accumulative 15

percent in energy savings. That's about 3800 gigawatt hours, approximately 37, 38 hundred gigawatt hours of load that won't be present on the grid in 2020 that would have been if it weren't for the energy efficiency programs, because our annual retail is about 24,000 gigawatt hours. So this just lays out -- we're trending now towards about 400 gigawatt hours a year in first year savings, and we've got plenty of money budgeted. We haven't been spending all of it. But as we increase the targets and we get away from the low hanging fruit, we expect that the costs of obtaining the savings, those incremental savings will go up.

Very quickly, non-energy benefits, so LA's making this 100, 120, 150 million dollar a year investment in energy efficiency, wants to see more than just reduced KWH You know, KWH reductions and greenhouse gas reductions from that investment. It's a local investment. So there's a lot of local things, you know, public goods that aren't energy benefits per se that come about from this as well. And so we actually adopted guiding principles in 2012 along eight dimensions, but basically they're having equitable customer access. Everybody has something for them. They can do energy efficiency, whether it's low income or high income, residential, commercial, industrial, institutional, non-profits, et cetera.

We also want to see this 120, 130 million dollar

local annual spend create skilled job opportunities for the local workforce. Energy efficiency is labor intensive, more so than capital intensive. So those dollars feed about 16 job years per million dollars that we invest, and we've done a study on that. UCLA gave us that number back in 2014. We're in the process of reengaging UCLA's Luskin School of Public Policy to redo that study for 2017 using the actuals of the last three years as well as new programs that we've subsequently launched.

Transparency, always good in the public sector to be transparent. We have -- and I'll talk more about this in the subsequent slide. I'll probably let Arman talk about it, but we have rate payer advocate. There's an Office of Public Accountability. Within that, there's a rate payer advocate who oversees everything the department does, one of which is energy efficiency, and so we work very closely with them on programs, the portfolio in general. We'll show you a snapshot we do to report out the portfolio cost effectiveness on an annual basis. So that's -- we're committed to that process. And, finally, community capacity building. We do a number of grants by council district and at the city wide level as well to build a grass roots not just support but knowledge and capacity to bring energy and water efficiency into our customers' homes.

Okay. So this will be a little bit different than

what Elena was talking about. This is our take on gross versus net and free ridership. It's phrased to be a bit provocative. So you'll have to just expect that. But the way we look at it, energy efficiency is a coequal resource and integrated resource plan. There's a pie chart I don't have on here that shows coal, natural gas, hydro, geothermal, nuclear and energy efficiency, and energy efficiency is a slice in that pie chart.

So from an integrated resource plan, you don't really care if the customer would have done it anyway. You don't really care about that whole free ridership attribution. You do care, however, that you've looked at the project and influenced it. Maybe you didn't influence it through your rebate, you influenced it through your QC process, and by putting it through the QC process, then you can take those savings to the bank when it comes to an IRP -- from an IRP standpoint. What matters to us most on the whole gross versus net is that we can count on those expected grid realized savings. That's gross, you know, what we expect to realize on the grid.

Now, the one caveat is we also certainly want to do the EMMV, which we do, to make sure those savings as expected, grid realized savings are actually happening. So we care very much about realization rate. We may not care about net to gross, but we -- but we sure care about

realization rate, if we're really going to bank on energy efficiency as a supply side resource.

So when it comes to free ridership and when you look at it through that lens, we really don't care if the customer would have done the project anyway. We do care that the -- that the project is sufficiently likely to achieve the expected energy savings such that we can count it as a supply side resource, and the way we develop that level of confidence is bringing those -- those projects through our review. You know, it was a very intensive review process that everybody who runs energy efficiency programs does an upfront verification, what's the baseline, what's being done, what are the expected savings, are they reasonable, and then did the project get done as it was presented, a very standard process for -- for that.

Now, you know, some programs you do 100 percent field verification. Other programs you do a statistical sample because the volume's too high, but regardless, you've got a methodology that is put in place to assure that you're getting what you're paying for and the customer is getting what they're paying for and expecting in their energy efficiency projects.

So in that scheme, I think of the rebate less as a carrot to get the customer to do the project. So it's nice, and that certainly happens, but that's less important, and

the rebate is more to get the customer to go through our QC process. The rebate buys down the transaction costs of participating in the program. The program's a pain in the butt to participate in because we ask a bunch of questions, and we need forms filled out and everything. The incentive is to buy down that cost of participation, and then what we get out of it is now we can bank on those savings in the IRP.

MR. SION: Just a quick clarification on the net aspect. For our evaluations, we still -- we still study what the net savings would be as far as free ridership and figuring out that free ridership ratio, but we use it for mainly on purposes of improving the program, finding, you know, better ways to market our programs, finding those hard to reach customers and such and not focus on the participants who would have done it anyway. So that's primarily the reason why we have it, although we apply it differently than -- rather than discounting the achievements that we have, we would rather use it as a factor to figure out where we could market our programs and improve them.

MR. JACOT: Yeah, there's the whole thing with free ridership is obviously we don't want to continue to pay for a transformed market. In our experience, we've seen estimates of -- or estimations of transformed markets are often wildly premature, and in the absence of programs or

codes and standards, things revert fairly quickly to the non-optimal scenario. So it takes a long time to actually truly transform a market, and it's usually through hard codes and standards. Phasing out incandescents is a good example.

This one's busy. I apologize, but we'll break it down. We're very invested in codes and standards. We've been on the codes and standards statewide team at the IOUs for five years now. We get significant savings that we report from codes and standards. I'm frankly surprised and don't really understand why the CEC wants to take codes and standards out of the reporting. So that's a conversation we can have, especially since the IOUs continue to count the codes and standards towards their goals. The CPUC -- CPUC did a proceeding last year, and were an intervener through -- through CMUA, but it was mostly our comments.

The early drafts, the proposed decision on the IOUs wanted to take away codes and standards from counting towards their goals, and the justification was, well, under AB 802 you've got an existing equipment baseline now. So codes and standards is all double dipping. We took a much deeper dive into it. Arman's the guru on this one as well as many other things, and we found the methodology to back out the double counting that was occurring in incentive programs so that we weren't double counting that, but we

were also able to show why conclusively that what was coming through the incentive programs is only a small chunk of what was actually being impacted by codes and standards. So we were able to net out the program participation. And, of course, we report the savings in the programs and back that out of the codes and standards, which this is --

MR. SION: Right. So -- so the chart we have over here is kind of demonstrating the portion that we had estimated for codes and standards out of the potential models, and essentially the methodology behind it was to figure out what is that double counting program participant side, you know, two-code savings. And essentially when we go through that effort, we found out that for the years that we started using existing condition baselines for our programs, it only accounted for about seven percent of the codes savings as far as that double counted part and that's projected to double count up to 20 percent or so in the coming years, and then we have a -- we have a gradual fall off. So that blue line is actually demonstrating what the gross savings are. The red line is the double counted part from program participation, and the adjustment is the green line basically showing what that adjustment looks like.

MR. JACOT: Yeah. So that's what we're actually reporting for codes and standards is the green line.

MR. SION: And it's important to also mention that

the program participant volume is far less than what gets impacted by code. So our participation size compared to the overall market that gets impacted by code is extremely small, and that's what this is kind of demonstrating already.

MR. JACOT: Yeah. I mean, if we -- if our programs are so wildly effective that every project that was getting done was coming through our programs, then the red line would be a lot bigger. You know, it might be half. It might be so much we wouldn't even do the codes and standards, but the truth of the matter is we don't do 20,000 projects a year, you know, or 50,000 projects a year. We do 5,000 projects.

MR. SION: And one other thing. This method was actually applied to the last submittal we had for the potential goals. So we did remove any potential double count from program participation.

MR. JACOT: And our position -- I don't know if it carried today, but apparently, you know, on the balance of all the information that was provided in comments, the CPUC reversed that element of the proposed decision to not let the utilities count codes and standards savings. So we won that one.

This one's going to be a little bit odds and ends, but let's start with cost effectiveness screening. In

talking with Elena, she had some various things she wanted us to cover. So we're going to do that.

For cost effectiveness screening at the portfolio level, very important to note we -- we do our -- our cost effectiveness portfolio level such that we have whole programs that are not cost effective. They serve other purposes. For example, those guiding principles in some cases. We have a snapshot methodology we use here to track the overall portfolio, where the dollars are getting spent relative to the TRC. So, one -- you know, everything above one is cost effective. Between one and .75 on the TRC is marginally non-cost effective, and then everything below .75 is, you know, more cost -- more cost ineffective I should say. And so on the right side is the budget and the spend, and these are actuals, and it gets a little confusing. It's a waterfall chart basically, but you can see that, you know, we're spending half the portfolio here. So by the time we get here, we've already spent half the portfolio above 1.0. This actually goes all the way up to 10.

MR. SION: And important to mention that the red and purple lines are actually projections and broken down to the measure level basis of cost effectiveness, whereas the green line is the actual based on programs and the mix of measures.

MR. JACOT: Yeah. Yeah, and so let's look at the

actual then. You can see that, you know, we spent -- so when you look at the actual line there, then you see that $66,000,000 is where we crossed. We spent the first $66,000,000 of the portfolio in totally cost effective territory. We spent another $3,000,000 in the marginally cost ineffective, and then the last 11 -- or $9,000,000 is in the cost ineffective programs, and it's things like our low income direct installs, weatherization program, and some other programs that serve more of a non-energy benefic, social -- social benefit than just aggressive cheap KWH.

We worked with our RPA, the Rate Payer Advocate, to develop this and actually suggested this format. We ran with it. We love it. It's a nice snapshot. Every year we do this, and they're happy. They just want to see that increment of growth in -- out in, you know, the pink is not swamping the portfolio.

MR. SION: And it's a means of controlling, you know, investment in the non-cost effective area, and their main concern is in future projections it showed that there was a lot of investment being made in that area, and they want to mitigate that as much as possible. So it's a good screenshot to take -- take a look at every year to see how much are we investing in that end and make adjustments if we need to.

MR. JACOT: Yeah. I mean, frankly, you know, the

city's political environment, a number of the programs that are in the pink area have -- have strong advocacy from certain constituencies, and so those programs aren't going away, and every advocate gets that. I mean, we see this even on the IOU side with some programs, but at the same time we don't want them to grow unchecked and consume the budget. So this is a tool to monitor that.

MR. SION: One thing we haven't shown over here actually is for future actual years that were actually looked at. What happened is we've actually leveled out quite a bit on the non-cost effective side. A lot of programs have moved to more cost effective metric. So we're actually doing quite well with respect to that, regardless of the mix of non-cost effective measures we have in our programs.

MR. JACOT: And as part of our potential study, we didn't -- we'll get to it, but we don't have necessarily a measure level cost effectiveness screen. We want to get everything we can get savings for. But you then have to manage the investment so you don't overspend, which is a good segue to the budget. You saw I laid out the budget through 2020. We will, as soon as targets are developed through this, whether it's the 2027 targets or all the way up to 2030, we'll do a deep dive into what that -- what those quadrants look like they need to be depending on what

the targets are in order to make that. We saw some fairly large numbers in there, $180,000,000. This year is probably the first year actually breaking $100,000,000. I think it would be about 120 or 130. So I think we've got some -- some head room, but depending on what these targets wind up being for SB 350 and if it's no codes and standards and if there's, you know, no net so we got to get more gross to get to that number, then the budget, you know, is going to need to be increased commensurately. So we don't have any sense of the magnitude of that, but obviously we'll have to look at that when those targets get a little bit firmer.

There was a question on rate design to support goals. At the broadest sense we have tiered rates, but beyond that, have they specifically been designed to achieve certain levels of energy savings by -- by conservation, by economic messaging? No. No, they haven't, beyond the fact that we just have tiered rates. So that was -- the rate design is inherently a political process as well. We just went through that process the last two years to get a five-year power rate action in place and the same on water. So we're not touching that until 2021 time frame.

And then a question on the differences between the 2014 and 2017 EE potential study. A lot of it -- a lot of the methodology stayed the same. We'll talk a little bit more on the next slide about that, but --

MR. SION: Yeah, so one of the main things that had changed from the previous study to this one was the mix of measures that were considered. So there's obviously a different set of measures that were considered last time. And the values for their savings, the unit savings have been updated since then. So that was one of the major changes.

Fundamental methodology, though, has been fairly the same and hasn't really changed. So kind of leading into this -- this slide here, we're just kind of showing the technical, economic, and achievable layers. We've gone through this before, but one thing to note, which is the standard practice, the economic screening for the economic potential usually gets applied to -- on a measure level basis. So their screen for TRC tests and basically taken out of the mix of measures considered for the next achievable potential.

So one major difference in our approach, we basically bypassed that, and we allowed for all measures to go into the mix, and the way we look at cost effectiveness screening is on the back end, to see how it -- how it represents the overall portfolio and the different programs that we had.

One other thing that we did differently was looking at the achievable programs potential. We tried to go through an optimization process, and instead of applying

a flat rate incentives covering cost of measures, which is typically what I've seen done in potential studies, what we're doing is applying incentive rates to different measure categories and a capping mechanism, which is kind of how we do our program designs. We -- we apply incentive rates to different measure categories, HVAC, envelope, sliding and so on. And then we cap based on some percentage of the cost, and that gets applied to the overall -- I'll show that slide later on and how that optimization is done. But that gets applied to the overall mix, and then we get some results out of it to see how well we've done, and this is just a quick snapshot of what's been submitted, our draft targets that were submitted for the SB 1037 report, kind of showing the mix of non-res, residential, and codes and standards.

MR. JACOT: And the caveat here is we knew when we were doing this that this is just a -- a straw because this process was unfurling and continues to unfurl at the same time, but, you know, most of the work being done subsequent to the March 15th deadline it's like this every year. So we put this through. We haven't taken these targets to board yet. We really didn't see what the point was since they're going to change significantly through this process. No need to get in front of them twice. So -- but for now this is what we got.

MR. SION: But, yeah. So the main things that

were adopted here were the double counting of codes and participating programs and the optimization process for the programs themselves.

MR. JACOT: And you can eyeball it, but basically the intent here was to keep us on a rolling 10-year trajectory for 15 percent energy savings, cumulative across a 10-year period. That's what the mayor had asked for for 2010 to 2020 and in loose conversations with the mayor's office about this, they, you know, presented that they would like to see that pace continue. So that's -- that's what we got here.

MR. SION: And I think there was a question if we had EE goals by programs, and so here's a chart that breaks it all down.

MR. JACOT: It's not terribly useful, but we've got all the backup. You know, if you guys want to follow up and get more -- more of the information, we -- this is just to show that, yes, those -- the buildup on this slide, which is what you saw in the SB 1037 report, does have a lot more granular data behind it at the program level.

MR. SION: Now, this would need -- you basically need to have a mapping of measures to programs essentially to get this, and we opted to go through that exercise. It was quite extensive, but we got through it. I don't know if any of the publically owned utilities went through that

effort, but we certainly did, and this actually helps us. It informs us on the goals and our program business plans that we have every year to associate, you know, savings with different programs and set goals for them as well.

MR. JACOT: And one of the reasons for us this is so important to do it this way instead of just having a measure list and 10,000 measures or 100,000 measures is that once you have programs and you bundle the measures into programs, you can get customers doing multi-measure projects of varying cost effectiveness of the various measures, but they're more comprehensive than if they were just doing a single measure in a vacuum. So you might have -- that's why we include measures that have a point one TRC. You know, if the customer wants to spend the money, why not? But the other thing is that they can also bundle measures together. HVAC sometimes doesn't stand on its own, but if you can get the customer to do a lighting project at the same time, then -- then it does. Then you've got an overall cost effective project with an overall acceptable ROI. You know, you might have a six-month ROI on the lighting portion and a seven-year ROI on the HVAC portion, but combined two-year, three-year, and it's within their comfort zone for that type of investment.

MR. SION: And that effort was essentially for matching up how we run our programs to setting up our

potentials. If a customer wants to pay for something in addition to what's considered cost effective, we let them have it. It's not going to preclude us from incentivizing.

MR. JACOT: Or reporting a savings. This is the optimization.

MR. SION: So, yeah, this is -- this is the optimization process that we went through, and I apologize for the busy chart. It's quite a bit, but essentially we basically have a list of measure categories that are broken down, and we apply incentive rates to them. What this chart kind of shows is basically we have this incentive multiplier and we want -- we run through iterations to figure out what the most optimal point would be, and then we have a revised incentive rate.

Then we also apply an incentive cap to the total measured cost. Because we've been using existing condition baseline, we want to include total measures as the capping mechanism.

So essentially what we would have is an effective incentive rate that uses both of those, both the incentive rates and the caps. So in certain cases we might be having a very high rate where the effective rate becomes a capped value instead. So you see in some cases, for example, it might show two dollars for one thing and then with the cap it's one dollar as an effective rate. But needless --

without going through the numbers, the last column is actually demonstrating the weighted TRC down to the measure level, and essentially anything that's greater than -- we're kind of using the same coloring scheme as what we had in the cost effectiveness chart earlier. Anything in green is basically greater than one. So essentially we have two measure categories, residential show and residential comprehensive that were below that 1.0 TRC.

MR. JACOT: Yeah. And we still do those, but we limit it. We limit our exposure to those.

MR. SION: Right. And over here this is broken down to a program level TRC, and we also have administrative costs multiply. So this is to figure out how much of the budget would be inclusive in administrative costs for marketing outreach, education and administering the programs, processing the incentives. And essentially what we have is the second to the last column is the weighted TRC over the portfolio of all the programs, and we see a couple of programs that are below that 1.0, but effectively when you have it all mixed, the entire portfolio is still cost effective.

MR. JACOT: Okay. We're just about wrapped here. A couple of other odds and ends. We wanted to talk about some of the new things that are coming and how we address reach codes. So far in reach codes we don't have a whole

lot per se. We've got cool roof ordinance which mandates cool roofs, and we still offer our incentive. And that's another thing I need to put out there just for this group and how you think about, you know, when something's required, you know, does the utilities still get the savings, and a lot of times, you know, with us POUs, we map one to one to our city. It's not like the IOUs that have -- you know, like Edison's got 77 cities in its territory and the cities all do different things. We have the one city, and so when the city wants to do something like require cool roofs, part of the way they can get it done is because DWP offers an incentive. So, yes, it's mandatory, and, yes, we offer an incentive because that's how we overcome the political hurdle of making it mandatory. Same thing on new construction. We've got an I think almost completely unenforced, but we have an ordinance around new construction should be 15 percent better than code when it's above like 7500 square feet.

MR. SION: Never got enforced.

MR. JACOT: Yeah, never got enforced. But, again, the reasoning for them even putting that through council is because DWP has new constructive incentives. So that's the reality of how -- the environment in which we operate. And, you know, you can't discount that in terms of the effects of some of the stuff we're talking about.

The EBEWE, that's our benchmarking and disclosure ordinance. I can never remember what it stands for. I can barely pronounce it, but that's our mandatory benchmarking disclosure. It's likely going to get rolled off July 1st because LADBS isn't quite ready yet. We don't know when it's going to role to, but it's coming, and year one will be 100,000 square foot commercial buildings and above, year two 50,000, year three I think 10,000. So that's -- that's kind of --

MR. SION: It stands for Existing Building Energy and Water Efficiency.

MR. JACOT: And then some new program areas where we're going after these accelerated goals, especially if -- especially if this process is going to set targets for us that -- that codes and targets don't count towards, obviously we need to backfill that with direct customer programs, whether they're upstream, midstream, or -- or downstream. So, one, we're -- we've already done this once, the door-to-door LED distribution, we're getting ready to do it again. Two 75 watt equivalent LEDs to every household in L.A., single and multifamily, all income levels, 1.4 million households, 2.8 million bulbs. Took us about three months to deliver those door to door with door hangers or bags that we hung on doorknobs and then spent a good amount of time cleaning up customers that didn't get theirs, got stolen,

whatever. We have some of that. The program and the scope -- but we're going to do it again, and we see the opportunity potentially to do it, make this an evergreen offering for at least five years and through sheer force of will just convert the residential housing stock to mostly LED lit. At some point you get to where you're done. We're a long ways from that.

We're developing a room -- a room AC, a window and room AC exchange or placements program, similar to what's been done with refrigerators. We're still doing low income refrigerator exchange, but it's really getting down to not a whole lot of potential left. It's getting saturated. I believe the IOUs have stopped. I don't think Edison does it anymore. We're getting not too far away from that, but the same company that does that is perfectly equipped to do this as well. There's a GHG capture element to it, and there's a lot of crummy old window ACs and room ACs throughout our territory. You know, we want to pick up. We want to have people turn in their working but ancient ones and give them a $50 gift card, but the bigger effort will be working with multifamily and their property managers to drop off, you know, the survey, drop off a crate or a pallet of higher efficiency, let their property management staff or whoever they have do it install them all, collect the old ACs, and we'll take those away and recycle them.

Behavioral EE, we -- we've got Opower onboard. We haven't launched yet, but we're planning to do anywhere between a third and all of our customers would be Opower effort at least for a year or two and see how it goes. We're excited about that.

And then this is -- this is off a ways, but once we're talking about transportation -- once transportation electrification, especially with light duty passenger vehicles becomes more and more of our load and with 100 percent conversion of the passenger vehicle fleet in L.A. to electrification, it doubles our load -- we go from 24,000 gigawatt hours to 48,000 gigawatt hours, tremendous -- then, you know, traditional energy efficiency doesn't really address driving, but there is a whole -- there's a whole lot of measures in the urban planning transportation area around reducing VMT, vehicle miles traveled. And so, you know, if you look down the road five, ten years and maybe 10 percent, 10, 15 percent of the vehicle fleet has been electrified, now you got a pretty substantial chunk of our load is going into that segment, and it's not something we can address through traditional energy efficiency. That's the point at which we might, you know, start working with the Planning Department or the Transportation Department and come up with some, you know, VMT reduction measures. Rideshare would work, Bikeshare, Carshare, things like that.

And, finally, I'm going to turn it back over to Arman to talk about this other thing we're looking at, which is a conceptual market transformation framework for evaluation.

MR. SION: So, before I go back to that, for the reach codes we actually do have -- the cool roofs, we are actually attempting to quantify non-participant savings through the case study reports and correlating that to permitted roofing contracts.

But the market transformation framework right now it -- basically it became in existence when we went through an evaluation process, and this existing building ordinance was coming about. It's not just a benchmarking ordinance, but it's also a call to action within five years to actually do something, either save 15 percent in overall energy savings within five years or become Energy Star certified or whatever the case might be. And with that -- with that being the primer to move the market forward, this ordinance actually wouldn't have existed if LADWP didn't have any programs to support the financial burden on the market.

So we had to come up with a way to address this, because essentially, if everybody had complied, everybody would be a free rider, and we couldn't really, you know, get ahold of figuring out how we're going to address and figure out how we're going to quantify it properly.

So we were approached with this market transformation framework to our programs. Essentially we have a logic model to basically push and pull the market. So the push is basically the mandatory ordinance and the pull is the incentives, and we're working side by side. They can't -- they can't exist without each other. They're fully dependent on each other, but what these graphs demonstrate are basically -- the green line you see over there is the Bass Diffusion Model if you guys are familiar with it. It basically demonstrates market -- market acceptance over time, and what you would have on the bottom line is -- on the dashed lines are basically the baseline where it's naturally occurring market adoption, and the lines -- or the boxes that you see here, the purple box on the left side, it's demonstrating a gross savings for the programs, and you see that they're cutting across the naturally occurring market adoption and above it, and that portion is actually demonstrated as the free ridership.

Now, there's a significant chunk in addition to that that's basically overall market adoption of these measures that are attributable to the programs but not necessarily quantified by direct participants. It's basically non-participants that we're talking about. So those are called the market effect.

And overall, if you look at the graph on the far

right bottom corner, the savings attributed to the program would be what's in red. Free riders' portion would be on the bottom part. Those are basically participants who would have done it anyway. And then you have the additional spillover on top.

In this particular setup, free ridership would be a bit more important in that sense that we want to make sure that we're quantifying it properly, but for the lack of not having any quantification for naturally occurring market adoption, we've -- we've adopted the gross approach to basically be able to quantify whatever we have or whatever we've touched. But in this particular setup, free ridership would be of importance but if you look at the overall impact, it's of much smaller importance than what the overall programs would achieve, and if the CUC is looking for that unknown portion, this might be a method to look into and see how to quantify non-participants into the mix.

MR. JACOT: Yeah, and we present this just as a thought starter. We're not running our program portfolio this way currently, but we're looking at it. It's something interesting. You know, non-participant spillover, if there is quantifiable impact there, you know, that might be a fair trade for the free ridership piece.

MR. SION: Yeah, the overall methodology to quantify this was through potential models, but they're

informed by market indicators from different market actors and observers basically. So through those factors, those indicators, we make adjustments to the potential models and see what the overall impacts are. That's the gist of it, but we have a framework kind of set up, and we have a report. It hasn't been published, but we could certainly share it for conceptual purposes.

MR. JACOT: Yeah, we'd be happy to share it. And that's it. So questions?

MS. GRUENDLING: Can I -- before we go into questions, I just want to clarify one thing regarding the goals and codes and standards. This is Paula Gruendling from the CPUC. So the -- the Commission adopts separate goals for codes and standards and utility programs. So what was in question last year was whether we should set goals for codes and standards, and the Commission decided that we'll continue setting goals for codes and standards. So the codes and standards savings count towards the codes and standards goals, not the overall utility goal. So they're sort of accounted separately. I just wanted to clarify that.

MR. JACOT: That's helpful. Thank you. Are those two different proceedings?

MS. GRUENDLING: No, same proceeding.

MR. JACOT: Same proceeding.

MS. GRUENDLING: So, actually, the adoption of the goals now in August, September is going to adopt goals for the utility -- the incentive programs and codes and standards, and there'll be just two --

MR. JACOT: Okay.

MS. GRUENDLING: -- separate buckets of goals.

MR. JACOT: I see. That's helpful. Thank you. Thank you.

MR. EARLY: And, John McQue, I think your line is unmuted if you want to ask a question.

MR. MCQUE: Yeah. And I think Paula's clarification was very helpful. I know that for this year there was sort of a -- you know, the first year after SB 350 we're trying to stay the course and -- and for this proceeding it's really important in terms of planning ahead and making sure that, you know, budgets and efforts are well integrated. And, you know, I'm still a little bit concerned about having, you know, these goals that are separate because they're really -- you know, ideally the portfolio is -- is integrated, and there really is a plan to move markets so that there's more activity in the codes. I kind of look at, you know, SB 350 as sort of like, well, you're running as fast as you can. We want you to run twice as fast as you can, sort of like Alice in Wonderland. And to do that, codes and standards are kind of like you're running through

the airport and you jump on the people mover, and so you're able to run twice as fast as you can because you're able to -- to innovate and move towards, you know, future technologies, and part of -- from my point of view, part of the problem with disintegrating the portfolio is is that, you know, this whole issue of PRC and that -- you know, for codes and standards, we actually need new products to feed the pipeline, and those products, a lot of them are likely going to be not cost effective, and to have a longer term view of -- of from nuts to salad allows -- you know, allows someone to actually have a vision of how we're getting from here to 2030 and to 2050.

The other thing I'd like to point out is that elections have consequences, and, you know, if -- if people think that the efforts that we're doing in codes and standards is -- you know, it's just going to take twice as much effort to provide twice as much savings, I think they're sorely mistaken. You know, the current applied standards that we all worked on at the federal level, they're being challenged, but future standards that are supposed to be updated, there's lots of uncertainty if those are going to be updated.

Questions about, you know, is -- is the state going to sort of take up the challenge for code enforcement for federal standards, you know, they have the authority,

but, you know, there's additional effort. And ideally, the programs can help -- help with this.

You know, many of the programs rely on things that are -- are done in terms of test methods and -- and, you know, from my conversations with folks at the national labs, everyone's getting ready for the ax. And so, you know, many of those test standards aren't going to have the same scientists that are working on them. And if you look at -- besides, you know, the test standards, there's also the voluntary standards like Energy Star. All of these things have -- they're headwinds, and, you know, if we have this challenge that we're trying to double the savings and we're not looking at economies of scale, we're not looking at integration opportunities, it's going to be incredibly expensive, and so, you know, I brought this up originally during the rolling portfolio, but I really encourage the Commission, you know, they talked about earlier, you know, you saw the LADWP, you know, graph that showed that well, you know, the overlap, it's there. It can be accounted for, and that's kind of similar to what the CUC in the -- in the staff document in regards to AB 802 has identified, that, you know, these things exist. We just have to be a little bit more careful and make sure we count the overlap. But I'm really concerned about, you know, pulling these apart. You want everyone to have skin in the game. You want them

to be responsible for the savings, and so I think it's -- and you want them to build on all the integration opportunities between, like I said, nuts to salad, so we've got a vision and a path to move things into code, to enforce codes, prepare the markets for codes, to prepare new emerging technologies. All those sorts of things, to me, if you -- if you isolate the goals, I think it -- it potentially disintegrates the portfolio. Thank you.

MR. EARLY: Any additional questions for David or Arman? Okay. Well, I think you gentlemen both for coming up, enduring Sacramento to give us the presentations. Really appreciate.

And so we're deviating a little bit from the schedule at this point. It's been a good discussion, but I think we're going to break for lunch if it's okay with SMUD, and I'm sure it is. And so at 2:00 o'clock we will reconvene and begin with Richard's presentation, and then we will move to Brian Samuelson. So see you back here at 2:00 o'clock, and for those on the Web, we're keeping WebEx active, but we will reconvene at 2:00 o'clock.

Thanks everyone.

(The meeting recessed to reconvene.)

AFTERNOON SESSION

--oOo--

MR. EARLY: Hello everyone. Bryan Early again with Commissioner McAllister's office. This is the staff workshop on the methodology behind establishing the energy efficiency doubling targets under SB 350, reconvening after lunch.

So next up we have Richard Oberg from SMUD, but I wanted real quick to turn the mic over to Martha Brook, also of Commissioner McAllister's office. She had a -- a follow-up comment on LADWP's presentation.

MS. BROOK: Yeah. Martha Brook here. I just wanted to -- to clarify that the work that we're doing here for target setting for SB 350 is not intended in any way nor did we have the authority to direct you to do anything different for your -- your utility programs. Either that's regulated by the Public Utility Commission or your local boards, and we certainly don't want you to stop doing codes and standards advocacy. That benefits the Energy Commission and the whole state, but we're just going to keep our books differently here, and we just wanted to make that crystal clear. Okay.

MR. OBERG: Okay. So they put me after lunch. So if I see any eyes, you going down, I'm going to call you out.

So there was a discussion here whether I should go before lunch or after lunch because a lot of what I'm going to say is a little bit of -- just like LADWP, because we have a very similar view toward the world because we're both -- we're both POUs.

So I'm Richard Obert. I manage the DER, the Distributed Energy Resource customer programs at SMUD. So that includes energy efficiency and demand response, storage, electric vehicles, connected home and some of our carbon based rate offerings for our customers. That would include our green energy product and our community solar programs.

So SMUD's a little different than LADWP. We're a municipal. We have our own elected board. We're not connected to the city or any cities or the county. We operate on our own. We're under a state -- state charter, but the business model is very similar to LADWP in that we don't make revenue, net revenue.

All right. So what I wanted to show you and it may be a little bit -- well, we'll see how you like it, but it's taking a look back in time a little bit on how we got to where we're at right now. So this is what our utility load looked like from 2000 to 2016. The yellow is the actual sales to customers. We run energy efficiency like LADWP but even a little longer. We've been at it since the

'70s, but at the '70s, early '80s was about the time we shut down a nuke plant, and so we really went hard corps into energy conservation. That happened in the '80s, and then it kind of tailed off when we started getting into deregulation talk in the late '90s, and then you can see kind of what it looks like from 2000 to 2016.

So the yellow is the actual load. The orange is what energy efficiency load reduction we got during that time period, and then you can see about 2008 is where the green starts kicking in. That's AB 2021 where we went not with the one percent or 10 over 10 years. It was one and a half percent, and that was what our -- our board went after, and so that's what we've been doing for the past -- since 2008 up until -- you know, if we get a different set of goals here, our board's pretty good about accepting what the CEC would like, once we've negotiated that out.

So that's what it looks like on an actual utility as far as how energy efficiency impacts the load.

Now, a couple of things I'd like to point out there. So on the very -- the blue line at the very top there, that's our customer increase over time. So we've gone from in the 500 -- 500,000 customer to over 600,000 during that time period, 21 increase in customer, but over the same time period, we only had an eight percent load -- increase in our load. So that's obviously an impact on

energy efficiency plus probably a couple of economic issues that went on during that time period, but you can see that our utilities are really dedicated toward that.

I'd like to push toward the AB 2021 time frame. We actually had a four percent increase in customers during that time period and a four percent decrease in load during that time period. So you can see it really does impact how a utility operates and how our -- our load forecast looks like.

We are different than I think just about anybody else. We do not use the TRC test. We use the PAC test because we treat it as a resource. So it's a resource, just like everything else, just like LADWP said, "Hey, you know, here's our -- here's our resource mix." We do the same thing. And because of that, we don't do TRC. We do the PAC. We actually look at it. We report it out in our 1037 report, but when we make decisions in our utility, it's based on the PAC.

And also -- and I -- I don't want anybody from Navigant to shoot me, but we don't use the potential study as our law and gospel. We use it as a good guidance, and it helps us make decisions, and the reason we don't use it as the -- the end all be all is that it's at a measure level, and we're programs, and we're looking at customers, and we don't want to miss those lost opportunities of where the

customer will pay a little bit more that we'll get knocked out. So -- so we really look at it -- we -- we analyze our programs at the -- with the -- with the PAC cost effectiveness. We look at them at the program level, but really we hold ourselves accountable at the portfolio level so that the whole portfolio is cost effective.

Let's see, and so our marginal cost we use a gas fired turbine as the -- what it looks like going out into the future. That's how we determine our marginal cost, and then we add a carbon adder and an RPS adder to that.

So, just to show you -- I like my graph better than LADWP's graph, but it's showing kind of the same thing. So these are what our programs mix are, and so this is kind of a complicated chart, but let me try and explain it here. So we set thresholds for each of the programs based on when they save energy, what time of day, and so those thresholds that are on the left side for cost effectiveness -- now, it's different for each program because they have different thresholds, and then going on the -- on the X axis is -- are the programs and their -- how much they contribute to meeting our goal of 158 gigawatt hours going across. So codes and standards, as you can see there, is 20 percent, and it's very cost effective.

The next program is our retail lighting program, which is an upstream incentive program, and then it just

goes on across there. After you get past retail lighting in that kind of mauve color, the next couple of programs are all commercial based programs because commercial is usually more cost effective, and the dotted line shows where we're really at compared to our threshold. So we're at about 50 percent.

So that's what it looks like for this year, and we're on a calendar year. So it's January to December. Let me see what else I -- so I did want to say a couple of things. Once again, I'm going to agree with LADWP. We don't -- we don't do net. We do gross. It's a resource. It's -- we treat it as found, as left. So that's really the savings we're claiming. We do take some guesses, same thing where the M and D studies come in and show us what the net to gross numbers are, but we traditionally don't use them. What we do use them in these studies are is the same thing. We're trying to improve our programs, make them better, get them out to our customers better, have a better delivery channels, better marketing, go after the right customers.

So, let's see, there was a couple of questions that got asked here that I wanted to touch on. There was a question about how the rates impact our energy efficiency programs. I don't think they have a huge impact. We haven't made huge increases in rates. So it really doesn't drive our customers to be more energy efficient. Starting

in January 2019 -- it was approved last Thursday night -- we are going to time of day rates for residential customers. So as of January 1, 2019, all of our customers except those that opt out will be on some type of a time of use rate. So I don't expect that to drive a lot of energy efficiency behavior. I do expect to get a little demand response from that.

The other thing that's a little different than LADWP is we do not include low income in our portfolio, and that's because of a cost effectiveness. Basically, the money we spend on low income, we figure that's kind of a public goods thing and we just put it off to the side. It's a significant amount on the rate side, and it's an okay amount on the energy efficiency side, but we do -- we are involved in energy efficiency for low income. We just don't include it in our portfolio. It really isn't -- it isn't cost effective for us.

So since the -- the talk was, you know, what's it look like in the future, I had my -- my guys take a -- take this chart and say, okay, let's take out codes and standards because that was talked about here a little bit, and the retail lighting program, we're actually in the process of shutting down. So our retail lighting program is actually working with manufacturers. We sign contracts with manufacturers to get light bulbs bought down in a lot of our

big box and some of our smaller stores. So if you walk into a Home Depot or a Lowe's and you buy an LED light bulb, we bought it down, bought the price down. But at this point in time you walk into Home Depot and Lowe's, it's pretty hard to buy anything but a CFL or an LED. So we're in the process of transitioning out of that. So next year, if we were to -- or this year, if we were to take away energy efficiency -- I mean take away retail lighting and take away codes and standards, this is what it would look like. Cost effectiveness gets worse, and we're only at 100 gigawatt hours instead of 158 gigawatt hours. So it does take a huge impact for us.

I say this to my associates at work all the time. The pie is shrinking, and so while we're in the discussion of how do we double things, we're doubling things on a pie that's getting smaller. The low hanging fruit at least for us is gone. We -- light bulbs that -- we still have some commercial lighting programs, but it's just -- it's slipping away. It's got to go deeper, and deeper is more expensive.

Let's see what else I wanted to say about these programs here. So we are looking at -- at new programs, some that are already in existence in other areas that we can use to try and fill in some of that 50 gigawatt hours or whatever the goals get set over this next year. So we have some ideas, but there are some things that, you know,

they're -- we're still working on. This is not an easy lift for us because it's -- the energy savings I think any utility will tell you is starting to get a little more difficult.

So the other thing that we are -- some other things that we're looking at and I'll touch on in just a second here is trying to bundle our programs together. One is, you know, since I'm -- my team's responsible for all of the DER resources, we're trying to bundle some of those together. So let's get a thermostat in that actually can have some DER capability with it along with energy efficiency. So, as we've gone to now, the new Energy Star thermostats, we're adopting those pretty quickly, and then we'll be able to go back to those customers for some DER functionality hopefully.

But our first really strong foray into trying to bundle this all together has been our residential new construction program. Bless you guys, but your residential Title 24 codes have made it pretty much impossible to have a program because there's really not much left. So we're trying to bundle that up with demand response. So we pay for a smart thermostat to be put in. We put some electric vehicle money into that. So we have the conduit run for an electric vehicle. And so we're trying to package some of the stuff up into bundles. It's not just energy efficiency

anymore, and that's the way I kind of treat my team. We're carbon reduction. So energy efficiency is a piece of it, but we've got to think toward carbon reduction and how we can get all of these things to work together on that.

So one of our -- and I -- one of my associates reminded me I'd really like to hit a little bit on the difficulty of Title 24 and the structure that's built around electrification. It's built for -- to use gas. It kind of forces us to use gas in residential new construction, especially with the TDV values, more particular, climate zone. It really gets pretty hard -- hit pretty hard with that, and so it's harder for us to start thinking about heat pump water heaters. Heat pumps and induction cooking, that's really the direction we'd like to go with our resident new construction program because there's just more value to it for the customer in the long run and also for the carbon reduction aspect of it.

Let's see if there's anything else I got to try and remember about this. So we do actually have a heat pump water heater program right now. For customers that are changing on an electric water heater, we have an incentive for them to go to a heat pump water heater. We also have one for customers that have a gas water heater, to convert it over. We had some issues with several that -- a couple of the communities here in Sacramento County because they

use Title 24 as their base, and so that had a barrier that we had to overcome with those entities to say, yeah, it's still good even though it's not gas.

So I'm -- I'll flip to the chart very quickly, but, once again, LADWP did a nice job of talking about market transformation. That also is something we've got on our radar screen. We think that that's a possibility in the future. If you, you know, look at our history, CFLs, LEDs are really good examples of how we went from an incandescent bulb. We've really transformed the market. That's why we're getting out of the retail business, retail lighting businesses, because it's been transformed. There's really -- with codes and what's available in the stores -- and the customers really love LEDs. There's just no reason for us to be putting any more incentive dollars into them.

So our other issue is building electrification. So I -- I described that for just a second there on how we're doing with the res new construction. But that's an area of opportunity we think that if we can get the carbon reduction value from -- going from an electric gas home to an all electric home, we think there's a real value to that to meet carbon reduction -- carbon reduction goals for the future, and we're trying to figure out what that metric looks like. I know we've had some conversations with CEC on how to figure that out and what value we should put on it,

but that is kind of our long-term objective in trying to meet some of our carbon goals by electrifying homes.

And that's all I've got. A little more than 10 minutes. I'm sorry. Are there any questions? So you're all sleeping after lunch. I got it. This was good timing.

MR. TOTH: Phil Toth, Southern California Edison. You mentioned the size of the pie shrinking and alluding to the symbiotic relationship between codes and standards that are above -- above code programs and it's something that I've been trying to wrap my head around for a while, and in seeing what 2014 and the doubling of that, embedded in there is an assumption that the doubling part is cost effective I believe, and, Mr. Jaske, you can correct me if I'm wrong. And I'm, again, trying to think how can we support 350 at the same time under the current -- the construct of our current program, which the building part is supposed to be outside of that, but you got to start somewhere, so let's start with the mindset of our current program.

Given that the size of the pie is shrinking, what is your feeling about the cost effect? Is there going to be an issue moving forward with the cost effectiveness under the current constructs or what's your feeling on that?

MR. OBERG: So I think that as far as the gas component of our power supply, pretty cheap. It's pretty cheap going into the future, but the renewable portfolio

standard does bring into the likelihood that our marginal costs are going to go up. I think that puts more things on the table, but it seems to me -- and this is just strictly my opinion -- that we've kind of been at this level and we're trying to get to this level. The jump is so high that there just isn't a ton of technologies that fill in that small little bit. You know, the low hanging fruit's been taken, and we all know it's lighting. Lighting's easy. You know, for us -- and we were talking about this at lunch. For us in a residential home here, we had a really hot day today, right? It's hot here. It's hot. Our customers probably -- you know, this is a generalization, but they probably run their air conditioners a month or two here. It's really not that much. So we've got a lot of air conditioners out there that are 20, 25 years old, and they're still running. Well, they're not running very efficiently, but they're not running very often either. So trying to go after a -- an early retirement type program after residential air conditioners is tough. Codes and standards makes it tough because the code air conditioner is so efficient our savings on our program is really around the ductwork around the air conditioner and making it tight. The savings we get from the actual equipment of the air conditioner is just so small now.

So I don't know. I'm -- you know, I think we're

all kind of looking for that silver bullet or I've heard somebody say the silver buckshot of trying to see something that's going to actually hit that we've got some -- I'm not giving up on energy efficiency. I've been doing it for a lot of years, but it's going to get more difficult, and it's going to get more expensive.

MR. TOTH: Thank you.

MR. JASKE: Mike Jaske, Energy Commission Staff. Phil, I think I need to describe differently your initial few sentences there of your comment/question. The -- as we -- as the staff understands the SB 350 construct, the doubling is a doubling of a particular pair of studies, a certain AAEE for IOUs and a certain POU for -- potential study for POUs. And there's no statement that that doubling is cost effective. That's why we're now thinking of it as an aspirational goal. The portions of the SB 350 text that talk about the constraints of cost effectiveness, feasibility, and the public health and safety which sometimes we refer to as reliability, those are filters to -- that are traditionally -- they're not new to 350. They're traditionally imposed to assure that there's net value that emerges from these activities. So those are still there, and they are -- they are filters or constraints and as has just been described and was pretty clear from the overview of the PUC potential study. Those create pretty

large limitations on what we currently can understand to be cost effective and feasible and reliable, and it's going to take different thinking about how to get anywhere near that doubling aspirational goal.

MR. TOTH: Thank you for your clarification, Mike. I stated it incorrectly. Thank you for --

MR. OBERG: John, what you got?

MR. MCQUE: Hi. This is John McQue. Great presentation. You know, the -- your benefit cost ratios or your percent of TRC one, you know, matches kind of my preconceptions about various programs and it's sort of borne out.

I think in some cases that I think folks are banking on some -- some efficiency measures that have yet come to roost, and in particular, especially a running lighting program, you're probably looking at 2018 at this huge cliff that, you know, California has -- has the -- you know, currently has the carve-out to essentially eliminate the incandescent A lamp and replace that with something that's 45 lumens per watt, and it's not a done deal. Things can happen. Elections change things, and if there's a huge blowback from the public -- the huge savings associated with transforming the lighting market can be lost, and, yeah, there's a bunch of LEDs in the marketplace. Unfortunately, you know, a couple of years ago we were seeing long lives

lamps that typically had, you know, 25,000 hour lifetimes and -- and color rendering index above 90. They were being replaced with lamps that have, you know, shorter lifetimes and substantially lower color quality and, you know, I'm kind of wondering if we're going to end up back with a situation of blowback and that there's -- you know, this huge savings that we banked may actually go poof, and so these kind of point to things related to programs that have impacts that go well beyond just energy. Well, they go -- you know, they impact energy because they're actually providing some consumer protection, and they're providing amenity and quality in the market, and so I'm a little bit concerned that we're taking our hand off the tiller at the last moment here, and already seeing, you know, lower quality products in the market, lower longevity, lower quality for the consumer, more flicker. There's a lot of different aspects in terms of quality that, you know, we may be losing. And so I'm just a little concerned about, you know, people phasing out that and -- and kind of related to sort of non-energy effect, there's this book out right now called Drawdown. Stewart Brand is one of the authors, and they had identified that sort of the biggest measure for reducing GHGs is -- you know, has to do with all the refrigerants, you know, the direct -- direct greenhouse gas emissions associated with refrigerants. That's like one of

the largest single measures. And so, yeah, there's -- you know, there's not only so many hours a year that these air conditioners operate, but it really sort of raises the question of, you know, if we look at the -- you know, the value of greenhouse gases, what or policy issues are and then looking -- looking at that in sort of a broader scope of more than just energy, I think there's some value here that we're maybe not capturing in just the traditional, you know, TRC unless we start actually including the value of carbon reductions.

Thanks.

MR. OBERG: Oh, go ahead. I was just going to make my pitch here. SMUD now has an incentive for natural refrigerants because we're trying to move along here in the carbon reduction world.

MR. EARLY: Christine, go ahead and ask your question.

MS. TAM: Thank you. I just wanted to better understand SMUD's rationale for using the PAC test and not the PRC test by evaluating the cost effectiveness of the efficiency portfolios.

MR. OBERG: So we treat our energy efficiency as a resource, and so it's really -- we're trying to compare like cost effectiveness, and that's the PAC or the old utility cost test, and so that's our reasoning behind that. It's

really what it -- you know, it's overall society good, and I understand all that, but we're a utility, and we're trying to make utility decisions, and that means that we have to compare our resources. That's how we take the approach with energy efficiency by using the -- the PAC.

MS. TAM: Thank you. I definitely agree with you. I think actually there are many instances where it's very difficult to apply the TRC because this -- especially for new construction and industrial applications, it's impossible to find what the so-called incremental measure cost would be. Thank you.

MR. OBERG: Thank you very much.

MR. EARLY: Thank you, Richard, and thank you for coming after lunch.

Okay. So next up we have Brian Samuelson with the Efficiency Division Staff.

MR. SAMUELSON: All right. Thank you. I just want to introduce myself. Brian Samuelson with the Efficiency Division here at the California Energy Commission, and we're the other division besides the Energy Assessments Division working on this information and the different -- what's rate payer, what's non-rate payer funded, and that's what -- we are talking today as the non-rate payer funding.

So we have seven different sections to the

presentation today. We're going to start off with some acknowledgments, core presentation concepts, basically some things you're going to hear a lot repeated, codes and standards, financing overview, behavioral and market transformation programs, industrial and agricultural and time line.

So, first off, we wanted to -- to say thank you to NORESCO and to their subcontractors, TRC Energy Services and the Center for Sustainable Energy. They're our contractor who has been helping us. They did the brunt of the work for the methodology that we're going to be sharing today. We also wanted to thank the California Public Utilities Commission and their contractor, Navigant, for their help. They've been a huge help, given us a lot of great information in a timely manner, and we're here today because of their help as well.

So some of the core presentation concepts I want to talk about before really going into the presentation is baseline demand forecast. When we look at this, we're looking at the baseline as reported in the Integrated Energy Policy Report, otherwise known as IEPR at the Commission, looks at the next 10 years of energy demand, and in order for the Demand Forecast Team to forecast ahead 10 years, they must calibrate their forecast to the last historic years demand.

Additional achievable energy efficiency or I will -- I'm going to shorten it and say AAEE, as defined again in the IEPR report for 2015 by the Energy Commission, AAEE is composed of energy savings not yet considered committed but reasonably expected to occur, including future updates of building codes, appliance regulations and new utility energy efficiency programs.

These energy savings are predominantly found in Navigant's potentials and goals study which is done on behalf of the CPUC. One thing I did want to clarify, as mentioned, when we're talking about AAEE in this presentation, we're drawing kind of the focus more on for Energy Assessments Divisions was more rate payer focused, and we're focusing on non-rate payer sources.

Top down approach, that was the initial estimates that was done, high level goal-based approach with initial available data. And next we have a refined top down using more informed assumptions with additional available data with a bottom up approach, being a detailed measure based energy modeling approach with additional available data.

So first off with our codes and standards, we're going to talk about the Building Energy Efficiency Standards, California Green Building Standards Code, which is otherwise known a CalGreen. It's also known as a reach standard. The Appliance Efficiency Regulations, Title 20,

the Federal Appliance Standards, and the Air Quality Management District's Program.

So starting off Title 24.6, the Building Energy Efficiency Standards, so with that, we have found -- or, excuse me, I should start off with a little description about the standards. It deals with energy efficiency standards for residential and non-residential building sectors, complies with new standards for new construction, for additions and alterations in the State of California. It has a three-year code cycle. So we estimate for future code cycles we're going to see them in 2019, 2022, 2025, and 2028. And those will be the standards that would go into effect before hitting that January 1st, 2030 time frame.

Also I wanted to pointed out that the 2019 standards are looking to be the residential zero net energy meeting the 2020 goal that has been set and mandated, and the potential 2028 standards would be for the nonresidential buildings.

I wanted to point out that energy efficiency savings for future standards will diminish over time because of the stringency of new standards each time. So there's going to be less savings attributed for -- for this program. So we're doing great by having better standards. It's just going to make it harder with using the standards to help us meet the goal.

However, future standards should be able to increase the scope and take into account things such as hospital loads, which it doesn't take into account now, as an example. There should be also a lot more opportunity for alterations in existing buildings because a lot of the focus has been new construction. We had some for additions and alterations, but I think there's going to be a lot more opportunity in the alterations for existing buildings.

For our AAEE and baseline overlap, I just want to point out the standard. So basically from the iteration, 1978 all the way through 2016, this is going to fall under the baseline or AAEE where the 2019 for new construction will fall under AAEE as well. I wanted to point out that it's strictly just the new construction for 2019.

So what we are looking at is additions and alterations for 2019 and anything past that that's going to happen for the January 1st, 2030 date.

So what we are looking at would be -- for energy savings potential would be a bottom up or a refined top down approach with the standards. So the following variables are taken into consideration. The value of maintaining consistency between the analysis of Navigant's past and ongoing analysis, availability of information regarding expected progressions of the standard over time and product scope and time line.

So I also wanted to point out that measure inputs may include but not limited to measure per unit electricity, gas and demand savings, building types effected, statewide floor space and effected buildings, naturally occurring market adoption, naturally occurring standards adoption and attribution factors.

They did do an initial top down statement, which, again, was more high level. One of the main things with that I wanted to point out is they're looking at percentage of efficiency increased from one standard to the next. So for 2019, kind of did initial approach. That would be 10 percent more efficient than 2016, with a five percent increase for 2022 and for 2025 and going back up to a 10 percent increase in 2028.

The California Green Building Standards Code, I'll just mention it as CalGreen, gives cities and counties the opportunity to participate in a voluntary program. It isn't mandated by the state. Again, these are cities and counties that want to go above and beyond what is required by our standards. They can do so by participating in what's called tiers. For residential, you have tier one, which is 15 percent above the standard baseline, or tier two, which is 30 percent above the standard baseline. For non-residential you have tier one, which is five percent with either lighting or mechanical and 10 percent if it's lighting and

mechanical, and for tier two, 10 percent with either lighting or mechanical or 15 percent if it's lighting and mechanical, and we are looking at CalGreen for 2019, 2022, 2025, and 2028, similar to the standards for building efficiency.

There would not be any overlap with AAEE and the baseline because we are looking strictly at the ones that did not fall under there and that Navigant's not looking at. So, again, with 2019, they're looking at new construction. We'll look at additions and alterations for that and the entire codes after.

From the bottom up or refined top down that they will look at doing, measure inputs may include but not limited to -- one thing, assume that jurisdictions that previously adopted local ordinances using CalGreen will do so again. Use past permit data to estimate future new construction and major renovations. Estimate the local ordinances will adopt performance level consistent with the next version of the Building Energy Efficiency Standards for building simulations. Model a package of measures that may be -- excuse me -- that may not be implemented in all projects. Local ordinances more often require whole building performance rather than the prescriptive measures, meaning that projects can use any mix of measures to meet the requirements. Therefore, a simulation using specific

measures would not be entirely representative of the savings that may be realized.

The Appliance Efficiency Regulations -- and I'll just say appliance regulations -- include minimum efficiency standards for appliances that are sold and installed in the State of California. There is no code cycle, but appliances and equipment are added and regulations are made more stringently frequently with different effective dates throughout the appliance regulations. So even though we have a 2016 appliance efficiency regulations, you will find different effective dates throughout the regulation. So it's not a set cycle like the standards, but you will have it when it comes out. You'll have different effective dates.

So we are looking at appliances from 2018 all the way through 2022. By looking at the 2018 potentials and goals study that's been mentioned here that there's a workshop for tomorrow at the CPUC, we are looking at those specifically from what Navigant presented so that we know which ones not to look at. They didn't cover every single appliance that's going to be included from now until 2029. Some things, for example, in the next few years that will not be covered in AAEE or the -- Navigant's study are industrial fans and blowers, sprinklers, spray bodies, tub spout diverters, irrigation controllers and standby mode and

power factor, whereas things like general service lamps and set-top boxes would be included in AAEE.

The other thing that they will be looking for is not just new appliances but also existing ones that could have an opportunity to be updated for energy saving potential.

With the bottom up approach, they'll develop a list of potential Title 20 measures that are viable for development and inclusion in Title 20 standards through 2029, and, as I mentioned, the ones that were identified by Navigant would not be included for that new measure. Where measure local data analysis is available, we will use this data to make detailed projections and savings potential and market penetration.

For the Federal Appliance Standards, that's going to be similar to our Title 20 Appliance Efficiency Regulations. So the Federal Appliance Standards, they basically create the minimum requirements, efficiency standards for appliances. With that, that means that the State of California does not create those minimums because it is done on a national level, and we adopt those efficiency -- minimum efficiencies.

The U.S. Department of Energy is required to review each standard at least once every six years for potential revisions and to set appliance efficiency

standards to levels that achieve the maximum improvement in energy efficiency. We'll be looking through the years 2019 through 2029, similar to our appliance efficiency regulations, to see what was not included in Navigant's report. One thing I didn't mention before, for appliances and the federal is for Navigant, they actually had appliances that were mentioned all the way through 2024. So anything after 2024 would be 100 percent non-rate payer. Where we can find some -- I will find some measures up to 2024.

For AAEE and baseline forecast overlap, there would not be an overlap because we are specifically looking at measures not listed in Navigant's study.

For the bottom up approach, we will focus on a high energy consumption appliances which have the greatest potential for energy savings and are known or prevalent in the market such as HVAC systems, domestic hot water systems, commercial washers and dryers and lighting.

For the Air Quality Management Districts Program, energy savings realized by this program is realized through CEQA, the California Environmental Quality Act, required mitigation through Air Quality Districts.

Where a project is anticipated to exceed environmental impact thresholds established by CEQA, mitigation is required. While a wide range of action can

contribute to mitigation, energy efficiency interventions factor prominently into the recommended strategies. So to date there is no information on California Air Quality Management District Programs that have energy efficiency programs. So no energy savings are expected to be captured in the baseline. AAEE also does not include these sources for energy savings expected to occur.

For the bottom up approach, one thing that we are looking at, we were looking, as this is a code and standards, in the future for doing the bottom up refined, we are looking at as probably more of a financial program from the research we've been doing. That's something we've been -- will continue to coordinate with NORESCO.

So there may be an opportunity to implement a bottom up approach that captures the anticipated efficiency impact, specific mitigation measures exceed code minimum requirements. But, again, we might be looking at it as a financial to increase savings, and then initial estimate savings were done as well.

Move on to the financing overview where we're going to cover the Property Assessed Clean Energy, local government challenge, Proposition 39, Energy Conservation Assistance Act, Low Income Weatherization Program, Water Energy Grant, and Energy Savings Program.

So the Property Assessed Clean Energy, otherwise

known as PACE, is a loan given out by private PACE providers to building owner. Loan is used for permanently -- excuse me -- permanent energy efficiency upgrades. One of the unique things about PACE is that it's adopted locally by cities and counties. It is not a statewide program. So not every area of the state has this program.

So energy savings potential with -- excuse me -- there is potential overlap with AAEE and the baseline. So because the program existed during the baseline forecast calibration year, some amount of energy savings will be incorporated into the forecast. PACE may overlap as well with AAEE if the property owner uses a utility incentive to help reduce the cost of the upgrade. One thing you're going to notice with the financing -- one thing that you'll notice is that with financing there's going to be a lot of opportunities for utilities to have some type of program. So there's going to be some potential overlap.

For the bottom up approach, to the extent that more data can be collected from individual PACE providers or from publically available databases, energy savings potential will be updated through refined calculation. There also may be an opportunity to implement a modeling analysis that captures anticipated efficiency impact of PACE finance programs.

For the Local Government Challenge, this is a

recent program that has been done through the state, it's a new grant program run by the Commission. There are two types of grants, energy innovation grant and small government leadership challenge. These are funded through the American Recovery and Reinvestment Act, otherwise known as ARRA. There is potential overlap with AAEE if the awardees do use utility programs or rebates for their -- funding these challenges.

For this program, they would be looking more for a refined top down approach, for detailed savings estimates of the individual energy innovation projects through a combination of research on each program and detailed spreadsheet calculations. So basically going through each of the different programs to see what possible savings could arrive.

For Proposition 39, that is K through 12 and community college opportunity for grant money to improve energy efficiency for their school, also for city and county buildings as well. So it started in the fiscal year of 2013 and 2014. It is coming down towards the end with the last applications supposed to be in by August 1st of this year.

One thing we are also doing is looking at potential energy savings as if a program is extended through 2029 to meet our doubling efforts. For AAEE and baseline forecast overlap, there is some potential because there are

opportunities to use different rebates from utilities to meet the -- the savings investment ratio for compliance with Prop 39.

For the bottom up approach, the Proposition 39 data sets will be analyzed at a more granular level to consider variations in savings potentials beyond the basic assumption, with the calculation approach to estimate energy savings potential for the program. Again, that would be -- even though it's ending, we're going to look at it as if it was going to continue on through 2029.

The Energy Conservation Assistance Act, also known as ECAA, is a zero or a one percent loan -- or interest loans offered to schools, cities, and counties to finance energy upgrades. Budget is limited to pay back of outstanding loans and effusions from legislation. There is potential overlap and -- well, actually, there is overlap with baseline and possibly AAEE. The ECAA program has been around for a very long time, and so with that it's already been taken into account in the baseline. And so, with that, we'd be looking at any funding that could be above what's already being given and what's being handed out, whether it's getting the money back and redistributing it to other loans or if legislation increases the amount of money being given.

For this they're going to use a refined top down

approach, confirm the overlap of savings claimed by existing targets and apply different scenarios to the ECAA program variables to inform the extent of incremental savings available.

For the Low Income Weatherization Program, it's a statewide program funded by the Greenhouse Gas Reduction Fund through California cap and trade auction proceeds and implements energy efficient measures in low income and disadvantaged communities. There is possible overlap of a baseline demand forecast because it was realized in 2015 when the forecast was done.

For the bottom up or refined top down approach, if more data could be collected from the Program Agency or from publically available databases, energy savings potential will be updated through refined calculations. If savings measures mappings are impossible to acquire, more complex analysis undertaking will be required to achieve more accurate saving predictions.

The Water Energy Grant Program is also funded by the Greenhouse Gas Reduction Fund and operated by the Department of Water Resources. It is the statewide program to promote reduction in greenhouse gas emissions primarily in the residential and non-residential sectors and particularly in disadvantaged communities. Overlap is possible with the baseline demand forecast, again, because

it was an existing program during the 2015 baseline forecast.

For a bottom up and refined top down approach, to the extent that more data can be collected from the Program Agency or from publically available databases, energy savings potential will be updated through refined calculations and will apply data analytics to evaluate technical potential of energy savings based on different scenarios and trends that may be relevant from 2015 through 2029.

The Energy Savings Program is administered by the Department of General Services, provides funding to state agencies to fund energy efficiency retrofits in their buildings through the Energy Efficiency Property Revolving Fund. There is potential saving overlap with AAEE. So in order to reduce the cost of the loan, some utility rebates may be used while participating in this program and causing the overlap.

For a refined top down approach, future impacts to the program based on the potential or likelihood of changes in funding reduce savings associated with diminishing returns in lower priority buildings and potential for improved savings associated in improved technology and codes and standards.

Move on to the behavioral and market

transformation programs, statewide benchmarking and public disclosure program. That's part of AB 802, the smart meter data analytics, behavioral recognition operations savings, energy asset rating, and fuel substitution.

So for the statewide benchmarking and public disclosure program, the Energy Commission has proposed regulations that require that owners of most building larger than 50,000 square feet to report building level energy usage to the Energy Commission annually, with commercial buildings beginning in 2018 and residential building beginning in 2019. It should be noted that the proposed regulations will make increased information available but will not require any building improvements.

For AAEE and the baseline, it is possible because the regulations are required by statute, AB 802, but not yet adopted, the savings may be attributable to the benchmarking and public disclosure program. It is possible for some overlap with AAEE if included in Navigant's 2018 potentials and goals study.

For the bottom up approach, Staff estimated the portion of the disclosable buildings for which owners will likely have audits performed and make the building improvements and multiplied this by a likely per building savings to calculate energy savings that may be attributable to this program.

This estimate excludes those savings attributable to the local benchmarking and public disclosure programs already in place, all of which are more stringent requirements than those proposed for the statewide program.

So I do want to show there was a question. We did change one of the titles of the slides to Smart Meter and Controls Program. This does have smart meter data analytics, as well as the program that I'm going to speak on next. This one is specifically typical measures for smart meter data analytics result in behavioral and operational savings and are included in the methodology for behavioral recognition and operations savings. This also includes from the 2016 action plan update the Energy Commission's efforts with the industry stakeholders to establish minimum qualification standards and evaluation protocols for eligible, low and no-touch home energy assessment tools.

The plan is to leverage the smart meters that have been installed in California to encourage reduction in energy consumption by providing consumers with realtime information on the cost associated with energy consumption at the time, saving energy consumption through more conscientious decision making. Adopted a narrow interpretation of smart metering just for this particular section because it's going to be included in the one after. That is the employment of a direct internet of things or

otherwise connected device to avoid overlap with behavioral recognition and operational savings.

Overlap with the energy savings with AAEE is possible. It's unlikely that any energy savings from this shift would be captured in the baseline forecast. However, the most recent updates to AAEE show that the utilities companies anticipate offering incentives for energy savings that come as a result of potentially similar behavior changes.

For a refined top down approach, it will be refined based on additional data and feedback from stakeholders.

Behavioral and retrocommissioning operational savings, this is a change in operating practices or technological settings. For AB 802 and Senate Bill 350 require the California Public Utility Commission and the Energy Commission to work together to include behavioral retrocommissioning and operational savings in their prospective programs. These programs target improvements that either result in accomplishing the same work more efficiently or reducing, eliminating energy use without relying on installation of new energy efficient technologies.

For behavioral, an example of that would be shifting the appliance and equipment use to off peak hours.

For retrocommissioning, it would be to have equipment checked to see if it is running at peak efficiency. And an operational example would be to train building operators on how best to run their buildings most efficiently with their appliances and equipment.

Potential programs include smart meter data analytics, as mentioned in the slide before, such as realtime feedback, online portal or in-home display. Looking at programs to 2016 to 2029 that are not included in that 2018 potentials and goals study. One of the nice things about these, many measures do not require any equipment upgrades. This makes it very cost effective.

There is overlap of energy efficiency savings with AAEE or that it's possible anything included in the 2018 potential and goals study by Navigant. For a refined top down approach, estimates will be refined based on additional data.

For the energy asset ratings for residential and non-residential, there is a residential energy asset rating that's current. However, there is not one for the non-residential. So when we talk about the non-residential, we're talking about if there was a potential non-residential energy asset rating, there are potential savings that could be attributed to that.

Both programs would be designed to determine an

asset rating of new and existing buildings that measure building performance and be decoupled from operational detail such as operating hours and building controls to help educate the building owner to understand and follow through with energy efficiency upgrades.

Energy asset ratings characterize the major energy use of the building through surveying and energy modeling. Potential -- or possible overlap with AAEE with baseline if similar programs realize savings during the time of calibration, which is 2015, and for AAEE, it's possible that similar programs are included in the next version.

For the bottom up or refined top down approach, based on additional data, look at what could be the ideal case for potential energy savings from residential and non-residential asset rating as if both programs are in effect.

Fuel substitution captures energy savings that can be achieved at the site level by substituting one utility supply fuel for another, in particular, natural gas to electricity. Potential overlap with AAEE if new utility programs are expected to offer fuel substitution measures. A bottom up approach would be used to finalize the list of electrification measures to be included in more thorough electrification analysis. Accordingly, a bottom up energy modeling approach will likely be necessary to realistically estimate potential natural gas savings associated with

electrification.

Moving on to the next section, which is our industrial and agriculture. So at this time, we didn't have much opportunity to find or create a methodology for industrial and agriculture. There is potential untapped savings for both. One thing we've noticed for both industrial and agricultural, you'll see the percentages put together, they do use about 25 percent of the energy use in the State of California. One thing Staff and NORESCO could be looking at would be the 2018 potentials and goals studies that was mentioned and what they have done for industrial and agriculture. And there's just the numbers for agriculture. So, again, we'd be looking at the 2018 potentials and goal study done by Navigant to see what they did, the calculations and what could be additional incremental above that.

So timeline for what you can expect, in July we are looking at the Energy Assessments Division and the Efficiency Division posting our separate papers for public comments. In August they are supposed to be combined as a draft Commission report. September would be the next workshop on the draft Commission report, with an October business meeting adopting the Senate Bill 350 targets.

This is my contact information, and for any questions I was going to invite Dimitri from NORESCO, and we

have Matt on the phone to help answer any questions on the methodologies being used.

Thank you.

John?

MR. CHANGUS: Jonathan Changus, Northern California Power Agency. I have a couple of different questions, and I'll try and -- I'll follow up more in written comment, but with codes and standards, the conversation today has really touched on as variety of different programs beyond, you know, buildings, state, federal, appliance, the advocacy work that IOUs have for sure been doing for years and that POUs are looking to get into as well. And so I guess a clarifying question is in the paper we'll be seeing in July, will there be more of a discussion of the specific different types of programs and activities that get captured between all that, because there's a lot of activity there, and in all candor, it's been really difficult as POUs looking to try and get involved in the program, understanding numbers and values associated with potential savings and what's attributed, there's a lot of work that goes on I think kind of behind the scenes, and if you're in the middle of those processes, then you probably know where to find those numbers, but for a lot of other folks, it can be very very difficult. And so hopefully in the papers there's an opportunity to try and

explore just what the different options are with the different types of programs because it's not just the white papers and the case studies. They go into what gets adopted. There's then the follow up thereafter and the implementation, and I think trying to understand what the different potential is for those different activities is very helpful in guiding kind of how we compliment and how we get engaged going forward. So that's kind of the first comment.

With regards -- I didn't -- any response?

MS. BROOK: Let's stop there just for a second. So it sort of sounded like you wanted us to help you find your way through Title 24. So sorry to be like cutting to the chase. Is that -- like I'm having a hard time figuring out are you just asking us that if -- for example, if we say "Oh, we're going to go 15 percent above Title 24," that you would have a clue about what that meant? Is that what you mean, like -- or --

MR. CHANGUS: I think it's important to understand what the specific activities are because there's what, six or so advocacy tranches, right? It's talking to --

MS. BROOK: Right.

MR. CHANGUS: -- planning departments and educating those folks. It's talking to builders and architects and informing those folks, and those are

different activities that help improve compliance with codes and standards could be sources of savings.

MS. BROOK: Okay. Okay. So I think what you're saying is articulate to the best extent possible the scope of what we're assuming for the potential.

MR. CHANGUS: Yeah, what are the different -- yes.

MS. BROOK: Because just as an example, my guess is we won't be saying, "Oh, if -- if you did advocacy -- if you did code enforcement so much better, you local government, you could -- we would assume you would get 15 percent better compliance or something." I think we're more likely to look at what the projection is in terms of CalGreen, for example, for 2019 and try to estimate the potential for that from a technical perspective and not -- and you would have an opportunity then to say oh -- see, the problem is I think for Title 24 specifically is the assumptions about compliance are all over the map and we don't agree within this room even within the Energy Commission what those numbers are, right. So it's going to be really hard to say, oh, and if -- we're going to identify this wedge of local government enforcement enhancements let's just call them, and it's going to get us X percent better compliance because don't have a baseline of compliance that's rock solid in which to bump up.

Do you see what I'm saying?

MR. CHANGUS: Yeah, I think -- I think that's fine. That's fine. Just whatever it is you go forward with, whether there's a shortage of quality baseline with which to make assumptions going forward, that would be useful. I think part of it is there's like a -- there's like a -- there's a CPUC FAQ sheet. It's like two pages long, that lists six different bits and the amount of funding and investment that each of the IOUs contributed to each of these codes and standards activities. I'm assuming that somewhere someone's done some manner of energy savings associated with those level of investments for cost effectiveness purposes if nothing else. I just don't know what they are. I don't know what the energy savings with those activities is assumed to be if there is an assumption, and I don't know if that's something we're going to go over moving forward. So, if we're not, that's fine. I'm just trying to understand when we say codes and standards and we're saying that the utilities, POU and IOU, there's no C and S component attributed to those POU programs and IOU programs. It's all captured in codes and standards. Then we kind of need to know, okay, well, what does that actually mean, what are the activities associated with codes and standards --

MS. BROOK: Okay.

MR. CHANGUS: -- that are being claimed, and if

there's stuff that's not being claimed, then maybe there is room for a conversation about, well, this is a specific action, this is a specific investment. We had, you know, this amount of resources. We put this amount of money to this codes and standards activity, that it doesn't sound like maybe you felt comfortable including. Is that something we should continue to talk about going forward? If there something we can -- or if there's something that we can provide you a comfortable baseline, because I believe there's going to be more of a POU interest moving forward with codes and standards types activities. As was mentioned earlier, we're not going to be able to -- we don't have -- the smaller communities may not be funding the actual case studies themselves.

MS. BROOK: Right. Right.

MR. CHANGUS: But that would be -- that's one activity. There's a lot of other things we might be able to do --

MS. BROOK: Right.

MR. CHANGUS: -- for which we could agree there's going to be some manner of documentable or energy savings.

MS. BROOK: Okay.

MR. CHANGUS: That we're not doing today.

MS. BROOK: Okay. I think that would be great. And I think as a starting place, I would encourage you to

put comments into the docket that say what you want us to do and what you can help with because my gut says that we weren't going there. We weren't going to say if you put resources into your enforcement activities, you're going to increase compliance this much and here's the wedge. So we -- not to say that we can't. I just don't think we -- we were going for more of the engineering perspective of the statewide code and bean counting up the measures and getting -- you know, multiplying that by climate zones, blah, blah, blah. So it's completely different, and not that they're mutually exclusive at all. So I would encourage you to put those comments into the docket, and you guys can --

MR. CONTOYANNIS: I want to make a comment. This is Dimitri from NORESCO. So, just to clarify a point that you made, the savings from codes and standards are accounted for in both the utility savings as well as the non-utility savings, and the reason why that's the case is we're relying on the PG study done by Navigant for the CPUC, and in that study they only account for codes and standard savings through the 2019 code cycle. So that falls within the so-called bottom wedge, the AAEE wedge. Any additional codes and standards savings for future code cycles are not yet accounted for in the PG study, and therefore, they fall in the middle wedge, which is the incremental savings that are not currently calculated by the utilities savings. So

hopefully that clarifies at least one point.

MR. SAMUELSON: Well, I also did want to clarify for the 2019, the new construction was in the bottom wedge. That was utility rate payer funded where we were only doing the additions and alterations for 2019. So the entire standard is for anything after that, but that was -- 2019 was a unique situation.

MS. GIYENKO: Elena Giyenko, Demand Analysis Office. Again, I want to repeat again the docket is 17 IEPR 06, comments due by June 30th, and all your comments will be considered in papers because we are currently writing them. So if you want to, you know, provide input, we will definitely consider that. The two papers will be published in July, and the final paper will be published in August.

MR. CHANGUS: The second tranche of questions -- well, just question, financing. So CAFA, the state treasurer's office also has some financing programs. Chief, in particular, comes to mind. I know that's funded with IOU dollars. So I wasn't sure if that might get captured somewhere else, but it wasn't in the list, and I was just curious if there was a specific rationale for that or if it's something that we should include in our comments as potentially something to add.

MS. BROOK: Well, I guess maybe you should help us understand. I would assume that if it's financed with IOU

rate payer dollars, then it's included in the goals and -- the goals in the IOU utilities.

MR. CHANGUS: Okay.

MS. BROOK: But if that's not the case or somebody knows --

MR. SAMUELSON: In general for financing we're finding out there's a chance for potential overlap so that that is being taken into account, and I know with CAEATFA they do work with the PACE loan program. I'm not familiar with any of the other financing ones that we deal with that they would be in charge of.

MR. CHANGUS: Okay. And I guess in a similar line then two final bits would be the Energy Upgrade California Program which I know is kind of co-branded with CUC and CPUC, but also relies on IOU funding, and then there's a number of strategies from the Existing Buildings Energy Efficiency Action Plan that a lot of that is in financing, but there's a lot of other strategies that were envisioned for the sole purpose of achieving additional energy savings, and so is there a plan to capture more of the EBEE strategies not listed here today?

MS. BROOK: I guess what I would say -- this is Martha Brook -- is that what staff is proposing is our first effort. So they have definitely -- I mean, the asset rating came from the action plan. The behavioral -- you know,

smart meter data analytics came from the action plan. It's all coming from that action plan. So if -- this is definitely why we are having this workshop is if we've missed a big tranche of programmatic activity that's going to achieve additional savings, absolutely, let us know.

MR. CHANGUS: Thank you.

MS. BROOK: But -- but it would be great if you were specific and didn't say "What about that all that other stuff in the action plan?"

MR. CHANGUS: Yeah. Duly noted.

MR. CONTOYANNIS: A general comment to that as well. You know, if there are items in the action plan that are currently captured in the utility savings in the PG study, you know, if you have a list and you want to clarify whether they are included in the analysis, send them along. You know, either we can verify that, yes, they're part of the analysis that's being done right now or, yes, they've been included in the CPUC Navigant study, you know, if there are things that we're missing, we have a really good working relationship with the Navigant CPUC team right now, and we can get answers for you on that.

MR. SION: Arman Sion with LADWP. For the grand majority of the points that you mentioned, there is a potential overlap, with AAEE and rate payer funded programs and such. I was wondering if there was any considerations

made for how it's going to be quantified or how that overlap will be quantified. Maybe Dimitri might be able to answer that.

MR. CONTOYANNIS: Yeah. So it's certainly a work in progress, and we don't have all the answers quite yet. So I'll talk to you a little bit generally about our methodology. You know, our approach for each of the programs that were discussed here today is to gather all of the publications that document the programs, you know, what measures are covered, what building types are effected, and what sort of, you know, funding is available for each program and what kind of documented energy savings has been published. And, you know, as you might expect, the level of detail is kind of all over the map. But what we're trying to do is develop trends to calculate, you know, the uptake of these programs. You know, ideally what we could do is, you know, dollars in versus energy savings out, but that's not always possible in every case.

So once we have that sort of metric, you know, the next step is to try to identify the overlap between programs. And, you know, to date we're making some very broad assumptions. You know, we're still pretty early on in the process, but what we intend to do as, you know, something that we're working on right now and intend to continue to dig into, is to request that type of information

from the CPUC, you know, what is the uptake of these programs, you know, what -- from a financing program perspective, you know, what percentage of those projects also participated in a utility incentive program. There's a lot of outstanding questions but I think that the answers to those questions will help identify the percentage assignment of savings to each program.

So, again, you know, I wish I could stand up here right now and say this is the exact answer, but essentially, you know, we've developed a matrix of, you know, savings per program and then, you know, potential overlapping programs. You know, it's a pretty broad matrix with a bunch of different dimensions. So, you know, we've got some placeholders numbers in there in terms of percent overlap. We intend to refine them over the next two months prior to the next workshop.

MR. SION: Okay. So a follow-up to that was actually something that I was thinking of. If, you know, the Energy Commission will be relying on utility data to parse out, you know, whether, you know, they've been participating in other programs, financing options and so on. I think it would be pretty a pretty difficult or significant list for individual utilities to figure that out, and how would they gain that information by self-reported numbers from the customers and so on? It will be

difficult to parse out. So, you know, I'm curious to see how that all, you know, pans out.

MR. GOETZ: Brian Goetz, Southern California Public Power Authority. Obviously you've thought long and hard about this, but there's one thing I'd like to caution you about is that as you're developing your forecast, not all of the municipal utilities or even the cities in the state are going to be interested in a lot of the financing programs or opportunities. There are a number of our members that aren't allowing PACE financing in their localities. So that's a consideration.

I have a couple of members actually when I talked to them about ongoing financing opportunities for energy efficiency programs, they said "We'd love to, but our city council told us we're not a bank. We can't do that." So just a broad based application of a generic assumption that all the cities are going to be able to engage in that framework is not going to be a safe assumption. So we'll address it in comments, but I look forward to seeing how that plays out when the forecasts come out next month.

MR. CONTOYANNIS: I agree with that statement. You know, our initial estimates are based on where those financing programs are in place right now with, you know, some modest projected increases. We definitely agree that there are going to be limitations to the uptake of those

programs, but thank you for your comment.

MR. GOETZ: Fabulous. Thank you.

MR. SAMUELSON: Okay. John, you're on.

MR. MCQUE: Hi. This is John McQue. I'm looking at slide 20 of Brian's presentation. I don't know if this is a question for Brian or for Martha, but, you know, I'm looking at the statewide benchmarking and public disclosure program. It discusses proposed regulations. I assume that they're enabled by AB 802, and, you know, and this is -- and, you know, regards sort of the 800 pound gorilla which is all the existing building stock, and, you know, when I think of, you know, the areas in the country that are probably the most, you know, aggressive on energy efficiency and existing buildings, what comes to mind is New York City, and they have a series of what they call local laws, and so similar to what's here in slide 20 is Local Law 84, which is benchmarking of large buildings over 50,000 square feet.

But, in addition, they have a date certain requirement for energy audits and retrocommissioning or control systems for all those buildings greater than 50,000 square feet, and it's based on the last digit of their tax numbers. So every 10 years, you know, keep cycling around, and then there's Local Law 88 which requires all these large buildings to have performed lighting upgrades and submetering by 2025, and I assume that, you know, just, you

know, how well known this program is in New York City, you know, what's Commission staff thought about some of these other initiatives by, you know, New York City and what sort of comparable thoughts are you guys looking at for addressing the existing building stock? Thanks.

MS. BROOK: Okay. So, John, if you could put that on the docket, that would be great. We -- as you know from the staff's presentation, we haven't thought about the next steps after benchmarking disclosure, and I guess the first thing that comes to my mind is with all the different discussions about potential overlap, we might not go there in this first phase of SB 350 just because, you know, we need to do our due diligence to establish preliminary targets that have a sufficient justification that they don't immediately overlap with known and existing programs, and it might be harder to do that with -- with a future program that would just be proposed at this point, but that's all my thoughts for right now.

MR. CONTOYANNIS: John, I'll just chime in too to say that the benchmarking program is one where we did assume a fairly significant overlap with other programs. You know, benchmarking in and of itself doesn't result in saved energy, but it does alert the building owner to potential for energy savings. So we assume that there would be overlap with programs like the BROS, as well as utility

incentive programs that would directly result from participating in the benchmarking program. So it's kind of, you know, a corollary to the two local laws in New York where one requires benchmarking and then there's another program that actually does something about it. So we did take that into account in our preliminary analysis, and we'll certainly be expanding upon that for the next round of our results calculations.

MS. CLINTON: This is Jean Clinton. I'd like to make an observation on the kind of conversation that's been going on for the last hour or so, which is sort of how to dissect the analytical work on setting targets for wedges, and as I was listening to the challenge that the Efficiency Division has taken on, it's sort of a laundry list of different kinds of realities out there that could be somehow looked at in a very matrixy kind of way. And so I wanted to make this observation for whatever it's worth.

First of all, it seems as though there's been this clear division of labor up until this point, which is the Assessment Division focuses on the utility type interventions, and the Efficiency Division gets everything else, and good luck in figuring out the overlap. And, as I was listening and to -- to everything that the Efficiency Division is trying to tackle, it -- I saw four -- four dimensions of what you're tackling. One is to identify ways

of looking at opportunities by the dollar source, you know, utility dollars, federal dollars, market dollars. Another way you've identified looking at programs is what I would call by program administrator, is it a utility, is it a local government or is it a market player. The third way you're characterizing different types of interventions to look at is if there's a policy or regulatory mandate such as code and standards and ARB -- or district requirement. IOU goals could even be looked at as regulatory requirements. It's like who's holding the stick, and, therefore, who's doing the analysis behind what the stick looks like. And the fourth dimension which I think came out in the comments from -- is it Dimitri at NORESCO -- was, well, you could look at it by building stock and use measures. You could try to look at trends in what's happening sort of in the reality in the marketplace, and so what I think might be useful going forward at least by fall is if the Commission could think about what's the primary scheme that you want to use in analyzing where the opportunities are and maybe what's a secondary scheme, and I asked myself that question as I was sitting here, "What would I vote for?" And I said to myself, "Well, I would narrow it down to two, and one would be by the building stock and use and measures," because in the long run, if you're going to track progress, I think that will be the say that you are able to track

progress. So that's probably a primary consideration.

And the second could be to try to track or estimate or measure by delivery intervention method, which would come back to program administrators, what can utilities do, what can local governments do, what would the market do, and that might include financing if it's -- wherever it is.

So I'm not voting for anything in particular, but I just think it behooves you to think about how you're going to use this information now because it's going to be a herculean task to try to parse through everything that the Efficiency Division has just laid out, and if you can think about your end state and how you're going to use the information, I think it might guide some of the decisions as you go along so you can decide where to focus your time and effort.

Thanks.

MR. SAMUELSON: Thank you.

MR. EARLY: Okay. Thank you, Brian and Dimitri. So do we have additional general public comment? Now is the time to do so in the room. What about on WebEx? Any -- sure. Okay.

So folks on the Web, if you have general public comments, now is the time to do so and also on the Web. Okay. I don't think we have any hands raised. Okay.

So, as has been stated, the due date for comments on the presentations given today is June 30th, 5:00 p.m. All of the presentations given will be docketed. Most are already on the docket. And, again, that's 17 IEPR 06, and then the one or two that aren't yet will be posted shortly. And if you can go ahead and try to, as always, submit comments sooner rather than later, that's extremely helpful. The sooner that we get your written comments, the -- the earlier we can take a look at them and try to make sure that we are addressing them in the papers. And, as has been stated before, there will, of course, be additional opportunity for written comment once the papers are actually docketed in July, and then certainly again when the draft Commission report, which is going to be a combination or, rather, a summary of the two staff papers and also a discussion of the 2030 goal, when that is docketed and then discussed in the workshop in August.

So thank you everyone for your participation, and this workshop is adjourned.

Thank you.

(The meeting adjourned at 3:29 p.m.)

REPORTER'S CERTIFICATE

I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were reported by me, a certified electronic court reporter and a disinterested person, and was under my supervision thereafter transcribed into typewriting.

And I further certify that I am not of counsel or attorney for either or any of the parties to said hearing nor in any way interested in the outcome of the cause named in said caption.

IN WITNESS WHEREOF, I have hereunto set my hand this 30th day of June, 2017.

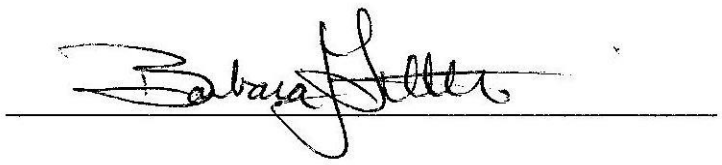
Eduwiges Lastra
CER-915

TRANSCRIBER'S CERTIFICATE

I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were transcribed by me, a certified transcriber.

And I further certify that I am not of counsel or attorney for either or any of the parties to said hearing nor in any way interested in the outcome of the cause named in said caption.

IN WITNESS WHEREOF, I have hereunto set my hand this 30th day of June, 2017.



Barbara Little
Certified Transcriber
AAERT No. CET**D-520