DOCKETED

Docket Number:	17-AAER-05
Project Title:	Phase II Pre-Rulemaking
TN #:	220587
Document Title:	Transcript of 7212017 Invitation to Participate Workshop
Description:	INVITATION TO PARTICIPATE WORKSHOP FOR LOW POWER MODE AND POWER FACTOR, SOLAR INVERTERS, SET-TOP BOXES,AND GENERAL SERVICE LAMPS
Filer:	Cody Goldthrite
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	8/7/2017 2:12:18 PM
Docketed Date:	8/7/2017

BEFORE THE

CALIFORNIA ENERGY COMMISSION

In the matter of,	)	
	)	Docket No. 17-AAER-05
	)	
Phase II Appliance	)	
Pre-Rulemaking	)	

ITP WORKSHOP FOR LOW POWER MODE

AND POWER FACTOR, SOLAR INVERTERS, SET-TOP BOXES,

AND GENERAL SERVICE LAMPS

CALIFORNIA ENERGY COMMISSION

FIRST FLOOR, ART ROSENFELD HEARING ROOM

1516 NINTH STREET

SACRAMENTO, CALIFORNIA

FRIDAY, JULY 21, 2017

10:00 A.M.

Reported By:
Gigi Lastra

APPEARANCES

CEC Staff Present

Ryan Nelson

Sean Steffensen

Kristen Driskell

Patrick Saxton

Carlos Baez

Public Present

Chad Worth, EIT, Energy Solutions

Charles T. Kim, P.E., Southern California Edison

Bijit Kundu, Energy Solutions

Pierre Delforge, NRDC

Anthony Serres, Philips Lighting

Katherine Dayem, Xergy Consulting, (WebEx)

Eric Rubin, Energy Solutions

Chris Granda, Appliance Standard Awareness Project (WebEx)

Peter May-Ostendorp, Xergy Consulting (WebEx)

Mary Anderson, PG&E

Alex Boesenberg, NEMA (WebEx)

Noah Horowitz, NRDC, (WebEx)

Debbie Fitzgerald, CableLabs(WebEx)

Richard Greenburg, Southern California Edison (WebEx)

INDEX

P R O C E E D I N G S

JULY 21, 2017 10:00 A.M.

MR. NELSON: Good morning. My name is Ryan Nelson. I'm a Mechanical Engineer with the Appliances Unit, here at the Energy Commission.

Thank you for coming to the Invitation to Participate Workshops. Today's topics we'll be covering are low power mode and power factor, solar inverters, set-top boxes, and general service lamps.

Before we get started just a few items we need to cover. When exiting the building, please use the front entrance, exit that you probably used when you came in this morning. The one out here, to your left, is alarmed. If you exit that way, the alarm will sound, so just a warning.

However, in case of an emergency please feel free to use either exit to exit the building and we will gather at the park directly diagonal across the street, across the intersection, and do a head count out there with the rest of the Energy Commission.

The restrooms are located directly outside of the meeting room, kind of to your left across the lobby. And there's a snack bar up the stairs, in the center of the lobby, just at the top, in the left back corner if you need something to drink, or a snack, or something to

eat throughout the day.

So, here's today's schedule. The schedule is tentative depending on the interest of each topic. Just note, if this morning's session does move along rather quickly, we may move solar inverters to the morning session. We'll make that decision depending on how long the first topic takes.

Then, we'll break for lunch and depending on how the morning goes we will return and cover, hopefully, solar inverters, set-top boxes, and general service lamps. And then, at the end of the day, we will end with a general comment period.

Throughout today's presentations we'll stop and open the floor for comments and questions. Please limit an individual comment to five minutes so that everybody can be heard and all comments can be made.

For those in the room, sitting at a mic -- if you're going to make a comment in the room, please come up to the table and use a microphone. Make sure that the green light is lit up on the microphone. That means that it's on. Some of them don't turn off, so if it's on feel free to speak.

Please state your name and the organization you're with for the court report, so that we can get all of the comments documented properly.

We'll take comments from the room, first, and then we'll go online to the phone, or to the phone, and then online to the chat box, in that order. Sometimes they pop up differently, after we've moved from the room and we'll come back to get your comment, if need be.

If you have information that you consider confidential, and we'll cover this real quick, the Commission does have a confidentiality procedure. So, contact one of the staff directly and we'll start that procedure, and we'll work with you to get your information submitted. But please be aware that any information submitted as confidential cannot be used directly in the rulemaking process. We'll have to aggregate data or the information in some fashion, so that we can make it public to the -- we can make it accessible by the public.

So, if you have any questions on confidentiality, please contact staff directly, and you'll see those staff contacts throughout the day.

Now, I'm going to hand it over to Sean Steffensen to cover this flow chart. Thank you, Sean.

MR. STEFFENSEN: Good morning, Sean Steffensen with the Energy Commission.

The flow chart addresses why we request the information and how we plan to use it. We need the

information to define the problem; in this case an inefficiency. The information provided helps, then, to define the solution.

The scope and definitions provide the what of what will be included in the standard. How do we know what will and will not be subject to the regulation? The efficiency metric provides the measure by which we can rank the performance of individual products. There can be more than one efficiency metric to consider. One or more may be chosen to develop the standard.

The test method defines the conditions under which the appliance is tested. Test data identifies the relative performance of products and allows consideration of a standard.

Once these items are selected, scope, definition, test method, test data and standard, an analysis must be performed to understand the effect of the proposed standard. Does the standard achieve the goals of significant water and energy savings, while being cost effective and technically feasible? If so, then it is a good standard. If not, we should reconsider the data and modify the standard to meet the criteria.

Thank you.

MR. NELSON: Thank you, Sean. Next up on the

screen is a diagram of the rulemaking process. Currently, the blue arrow indicates where we are in that process. We're in a public workshop to vet information that was submitted during the invitation to participate.

The next step in the process will be we will invite you to submit proposals. That notice has already been posted and we will cover that further on in the day, but that's the next step.

You can see we're early on in the process. If you have information, either today or in the future, please feel free to submit it to the Energy Commission. The dockets are still open.

And that concludes my introduction. I'll hand it over to Kristin DRISKELL, for low power mode and power factor.

MS. DRISKELL: Thank you, Ryan. Good morning, everyone. My name's Kristin Driskell. I'm the Manager of the Appliances and Outreach and Education Office. I am not Soheila Pasha. Soheila's out sick today so I am presenting her presentation, in her place.

She is on the WebEx, so if I say something incorrectly or if there is a technical question I can't answer, I'm going to invite Soheila to chime in by phone.

MS. DRISKELL: So, this session we'll cover low

power modes and power factor. I'll start with the purpose of this proceeding, then we'll do low power modes and take your responses as I go through the slides. We'll cover power factor, then, and take responses. And then we'll have a time for general comments on low power mode or power factor, or both. And then we'll cover next steps.

So, this process really began in March 2012, when we adopted an order instituting rulemaking for standards, test procedures, and labeling requirements for three phases of appliances. This Phase I is still wrapping up. This is Phase II.

The last step we had, we had an invitation to participate workshop, which was held on May 11th, and the stakeholders were asked to provide data and analyses to support the Energy Commission's Phase II appliance standards.

In this workshop I will present the results of those comments received and provide areas for discussion on those comments, whether we missed anything or if you want to clarify any of the information that you submitted.

This is a list of the appliances that were identified in the invitation to participate. I'll be covering low power mode and power factor, starting with

low power modes.

The respondents to the invitation to participate, specifically on the low power modes, were the California Investor-Owned Utilities, ITI, or sorry, Information Technology Industry Council, Natural Resources Defense Council, TechNet, Consumer Technology Association, the Internet and Television Association, California Cable and Telecommunications Association, ARRIS Group, and Philips Lighting.

This shows the information requested in the invitation to participate. I will review, again, the responses we received, followed by a discussion section on each response to get your feedback or if you would like to add additional comments. And if we need more time for a discussion then I have planned for here we can have time at the end, under the General Comment section to take additional comments. Or, you can submit written comments to the docket.

The first subject is the framework. Because many products could potentially be in the scope of a low power mode's rulemaking, it is essential to develop a straight forward framework that can be applied across multiple product categories.

Most of the comments that we received supported the horizontal/vertical approach. In this approach

products are divided into different clusters, in which products with similar functions are grouped together and a horizontal-based power limit is assigned to each cluster.

Products with other specific functions or capabilities can earn additional power allowances or vertical adders.

The IOUs and NRDC suggested that we also include auto power down with these power limit standards.

Philips suggested that the policy should be applied to the system as a whole and not be applied at the component level.

CTA, CCTA and NCTA suggested that if small network equipment end up with the roadmap scope, they should be included with set-top boxes, not separately with low power modes.

At this point I'll break for a discussion. Are there any comments on how products in the scope should be divided into different clusters, what each cluster of products should include, or any specific products or product categories that we can include in these clusters, or exclude?

I'll start with comments in the room. Pierre.

MR. DELFORGE: Pierre Delforge, NRDC. As indicated in our comments we support keeping the scope

as broad as possible at this stage of the proceeding. The savings potential from low power mode comes from being able to address as many products as possible, given that individually each product may have limited savings. But the majority of savings comes from being able to address them in a cross-setting manner.

There may be reasons to narrow the scope down, you know, further down the road, when we have better analysis and data. But at this time we think it's important to keep it as broad as possible.

MS. DRISKELL: Thank you, Pierre.

Anyone else in the room? Do we have any comments online?

MR. BAEZ: Online we have Katherine Dayem. Did you have a comment, Katherine?

MS. DAYEM: Yes, this is Katherine Dayem, on behalf of the California IOUs.

First, we echo Pierre's comment about first having a broad scope and considering a broad scope, and then use test data and information to narrow that scope down, as necessary.

And then another comment on the clusters and what products should be included in them. The IOUs are not ready to make recommendations on that, yet. We'd like to collect information and base those decisions on

test data and product investigation, before making some recommendations on clusters.

And just to clarify, the four clusters that are given for example, on the top of this slide, those were proposed by Bruce Nordman, when he was talking about clusters for network standby. And so, the IOUs aren't recommending those for this scope, which could include more functionalities beyond network connectivity for the low power mode roadmap.

So, we see the goal of creating these clusters as a means to group similar product categories together that provide similar functionality or service to users. And that way the adders in each cluster can be based on similar cost effective, technical pathways that each of the product categories in the cluster can use and implement.

So, that's just a little background behind the IOUs' thinking on clusters.

MS. DRISKELL: Thank you, Katherine.

Are there any other comments on framework?

Seeing none, I'll move to the next topic.

The next main topic is product definitions and scope. The IOUs and NRDC, as we actually just previously heard, recommend that we keep a broad scope, including consumer electronics. NRDC further

recommended that we include products with existing State standards, since they are not federally preempted. Both IOUs and NRDC recommended excluding federally preempted products at this time.

ITI suggested including products that have the highest potential for energy efficiency and recommended not including products that are federally or internationally regulated, mobility products that primarily operator on battery power, or network or network infrastructure equipment.

Philips recommended including connected indoor and outdoor lighting.

And CTA, CCTA, NCTA and ARRIS recommended or commented that the execution of the 2013 voluntary agreement on small network equipment resulted in ongoing improvements to those products and suggested that, therefore, small network equipment be excluded from the scope here and just covered under the voluntary agreement.

Product definitions are also very important to ensure that we all understand what products meet the intended scope and what don't.

Most of the comments didn't include definitions at this time. However, Philips provided a list of new definitions for function, modes of operation, off mode,

and standby mode.

I'm going to pause for a minute so that anyone who hasn't seen this can read through some of those definitions.

(Pause)

MS. DRISKELL: Philips also provided definitions for active mode and standby power. Some of these definitions are specific to lighting products, so we would need product definitions that are broader than just lighting products in order to do a low power roadmap.

At this point I'll pause for some discussion. Are there definitions available or references for definitions for other products that should be in the scope?

Should each product cluster have different levels and definitions for sleep and standby modes? And are there any other comments on scope?

Go ahead, Eric.

MR. RUBIN: Hi. Eric Rubin on behalf of the California IOUs. First, I'd like to make a clarification about scope.

I think on the previous slide it said that the IOUs recommend excluding all federally regulated or state regulated products. And just a small

clarification on the state regulated products. It's only state regulated products that were regulated within the last five years that we would be considering to be excluded. Otherwise, they could be revisited.

So, basically in line with NRDC.

MS. DRISKELL: Thank you for that clarification.

MR. RUBIN: Sure. Also, on the note of definitions, we don't have definitions for different modes that we're ready to suggest at this time.

I noticed that a lot of the definitions that are up here so far are more mode centric. And I'd just like to highlight that the approach that we're currently taking is more function centric. So, looking at allowances for different low power mode functions, rather than power draw limits for different low power modes.

MS. DRISKELL: Thank you, Eric.

Any other comments in the room on product definitions and scope?

Any comments online?

Okay, we will move on to the next topic. I will not move on to the next topic.

MR. GRANDA: Hi, this is Chris Granda from the Appliance Standards Awareness Project. Basically, what the broad scope is as presented by NRDC and,

specifically also the inclusion of networking equipment. Thank you.

MS. DRISKELL: Thank you, Chris.

All right, I will take the next slides then.

In response to our request for existing or under-development standards for low power modes we received a number of comments. Existing low power mode standards include European Commission, Natural Resources Canada, California Standards which were adopted by some other states, such as Connecticut and Oregon, the Korean E-standby Program, Energy Star, G-20 Connective Device Alliance Voluntary Agreement, and Communication and Power Management Protocols.

The IOUs commented that IEC 62301 has instructions for how to measure standby power. However, that there's no harmonized test procedure for how to set up the test before the measurements are taken.

The IOU CASE Team is working to develop the procedures for test setup for low power modes and power measurements for auto power down.

CTA, CCTA, and NCTA listed NCCTA 2043 and 2049 as test procedures for small network equipment.

ITI provided the list here for test procedures. These include European technical specifications for routers and switches, and for network standby, IEC

measurements for standby power and household electrical appliances and for computers, and DUE test procedures for battery chargers.

Finally, Philips commented that NC and IEC are working to develop test procedures for lighting equipment and low power modes, including off, standby, and network modes.

I don't have a discussion question listed, but I will pause in case anyone has any questions or clarifications on existing test procedures or test procedures under development.

(Pause)

MS. DRISKELL: I see no comments in the room. Are there any comments online? Okay.

For baseline energy consumption we only received data for small network equipment. CTA, CCTA, and NCTA provided idle mode power of 9.38 watts for non-efficient models sold in 2015. The voluntary agreement sets the maximum allowance power at 7.92 watts.

Staff calculated average idle power for all devices according to the 2015 Voluntary Agreement Report, and found it to be 8.8 watts.

For discussion, are there estimates for baseline energy consumption for all devices in the scope, or sources where we can find those estimates? And how

should the Commission go about making duty cycle assumptions for each cluster of products?

Eric?

MR. RUBIN: Hi, Eric Rubin, on behalf of PG&E this time. I'd like to point out that PG&E is currently undergoing an in-depth data collection effort for this topic and others. It's the Codes and Standards Field Study. And the results of that will be certainly relevant to both of these questions.

One portion of the field study is a comprehensive survey of 1,000 homes in PG&E territory. So, that will be relevant to getting saturations for stock. Also, there's a metering component and sub-metering. So, from that we can get baseline energy consumption and should be able to tease out duty cycles, as well.

MS. DRISKELL: Do you have an estimate on when that data will be available for use?

MR. RUBIN: I'll defer to Mary on this.

MS. ANDERSON: This is Mary Anderson, PG&E. We're in the field on the metering study. The thousand-audit results are available right now. Please note, we have a thorough inventory, but did not go through people's drawers and closets, as it's a best practice not to.

But the metering, we should have a year's -- we should start getting the years' worth for the entire study about January 1, 2018, and we'll have a full year of data January 1st, 2019. But for many of these products that are not climate dependent, we should have data before then to be able to help inform this rulemaking.

MS. DRISKELL: Thank you, both.

Any other comments in the room on baseline?

Pierre?

MR. DELFORGE: Pierre Delforge, NRDC. I just want to mention that there's the NRDC In-home Energy Analytic Study from 2015 that's available, and referenced in our comments, where we measured -- actually, we did a detailed audit of ten homes, went through the closets and everything. And we found an average of 60 devices per home. And this data is available in our report.

MS. DRISKELL: Thank you, Pierre.

Are there any comments online?

Okay. We received the market data shown here. ITI commented that by 2020 there will be 50 billion internet-connected devices altogether. And for small network equipment there are about 2.6 million broadband modems, 20.7 million integrated access devices, and

about 5.6 million local network equipment sold in 2015.

The source of this data is the annual report from 2015, for the Small Network Equipment Voluntary Agreement.

For discussion, do these estimates seem reasonable? And is there additional data available on stock and shipments for products that are potentially included in the scope of this roadmap?

Eric?

MR. RUBIN: Just Eric Rubin, on behalf of PG&E. To echo my last comments, the Codes and Standards Field Study will be relevant to the stock, specifically the inventory, which is already complete.

MS. DRISKELL: Thank you.

Any comments online? Okay.

We also requested information for modes of operation, duty cycle, product lifetime, energy-consuming features, energy-saving features, tradeoffs and solutions, cost analysis, and impacts to small businesses, and market competition.

We didn’t receive any comments on these topics. This is understandable since many of these topics rely heavily on what products are included in the scope of the roadmap. So, we expect that we will receive data on these topics as we develop the roadmap and receive your

proposals.

I'm going to turn, now, to power factor. These are the organizations and individuals who submitted comments on power factor. The California Investor-Owned Utilities, Information Technology Industry Council, Natural Resources Defense Council, ARRIS Group, and Armin Hauer.

Again, this is the list that shows the information we requested in the invitation to participation. Similarly to the last bit, I will review the responses we received, followed by discussion questions to get your feedback, or if you would like to clarify anything, or add additional comments.

And if we need more time for discussion, there's still a general comment period at the end or you can submit written comments.

Power factor, like low power modes, has the potential to cover a wide range of devices. However, unlike low power modes, power factor minimums can be applied across all products without impacting their functionality.

NRDC and IOUs agree that a horizontal policy could be applied for a power factor, rather than a vertical approach of setting power factor requirements for each individual appliance.

For discussion, should products be divided based on displacement power factor and harmonic distortion or on product types, similar to low power modes?

Is there another framework that might work well for power factor?

And I think a question that's not on here, but I'm going to ask anyway, should a power factor roadmap focus only on specific modes as an example for framework, such as active mode versus low power modes?

And I'm going to pause, now.

(Pause)

MS. DRISKELL: I see no comments in the room. Are there comments online?

MR. BAEZ: Online, we have a hand raised from Peter Meaustindorp. Do you have a comment, Peter?

MR. MEAUSTINDORP: Yes, I do. Hi, Peter Meaustindorp on behalf of the California IOUs. Just a point of clarification. So, I think while it is true that in our ITP submission the California IOUs support a horizontal approach and it could be feasible for a power factor. Our ITP submission, though, also presented optional frameworks, such as a vertical approach to addressing power factor in which, you know, several, it could be 10, or a dozen, or 20 high-priority power factor products are visited as part of the roadmap.

Ultimately, you know, we think that a technical analysis should drive that decision. And so, we're conducting ongoing analysis and data gathering to assess those sorts of decisions.

I suppose, you know, another question directly related to the discussion question on the screen, should products be divided based on displacement power factor and harmonic distortion?

I think that is a possibility. We would say that those are viable ways to divide products in terms of the technical pathways that might be appropriate to achieving savings. This would be more relevant in a horizontal approach, the need for clustering. But it's too early to know what the best approach for clustering might be, you know, were the CEC to pursue a horizontal approach.

So, I think that kind of summarizes our stance on this one, so just some points of clarification. Thanks.

MS. DRISKELL: Thank you, Peter.

Pierre?

MR. DELFORGE: I do have a comment. So, we think it's important to -- I acknowledge Peter's comments on the fact that there may be some alternative ways. But at this stage we still support doing a

horizontal approach because we think that the technical pathways to pulling power factor are probably common. You know, power factor, distortion power factor comes from situational power supplies. And, therefore, the technical pathways are likely to be within power supplies. And we see it as a good candidate for a horizontal approach.

But, obviously, you know, we agree that the analysis should inform the ultimate decision about how to go about this.

In terms of the question on active versus -- and/or low power modes, we think it's important to include all modes and to include low power modes. Although power factor impacts are much lower in low power modes, they're also additive. And given the high number and the growing number of products with low power modes, with the internal things, you know, internal connectivity or ways and modes, these add up and in aggregate they can have significant impacts.

So, I think it's important not just to limit power factor, as has been done so far to set a limit, like 75 watts, but to look at opportunities even at low power levels.

MS. DRISKELL: Thank you, Pierre.

We received several comments on scope and

definitions for power factor, similar to the comments received on low power modes.

The IOUs and NRDC suggest that the Commission initially consider low power mode and power factor together. So, I assume similar products and clusters. But to be open to decoupling them if more analysis and data becomes available that indicates that separate approaches may result in more energy savings or be more cost effective.

ITI suggested including those products that have the highest potential for energy efficiency and excluding products already regulated by federal or international standards.

ARRIS suggested excluding small network equipment from the scope as it's already covered under a voluntary agreement.

Are there any other additional comments on scope and definitions?

Are there any comments online? Okay. I have some hand raises popping up.

MR. BAEZ: A hand raise from Katherine Dayem. Do you have a comment, Katherine?

MS. DAYEM: Yes, thanks. Katherine Dayem, on behalf of the California IOUs.

Just kind of a response to ITI's suggestion to

exclude internationally-regulated products. There is a standby regulation in Europe and I think that's what they are referring to excluding.

But the IOUs think that the Energy Commission should also look at these products to be regulated and not exclude them.

You know, we see different products developed for different markets and just because a product is regulated in one market doesn't necessarily mean that the energy-efficient products actually make it to the U.S. market.

And then a comment on small network equipment. We support including small network equipment in the low power mode scope. We see them as having high potential for savings and shouldn't be excluded at this time. Thanks.

MS. DRISKELL: Thank you, Katherine.

Are there any other comments online? Okay, thanks.

We also requested information on energy-consuming features related to power factor. ARRIS suggested addressing poor power factor -- or, responded that addressing poor power factor in products with capacitive inputs, like consumer electronics, could result in higher energy consumption if the Commission

does not also address power factor, and high power consumption products with inductive inputs, like refrigerators.

NRDC commented that poor power factor causes energy losses in the building wiring and on the grid, which wastes energy.

IOUs suggested evaluating opportunities to improve both displacement power factor and harmonic distortion, and consider a range of technological pathways for improving power factor appropriate to each situation.

Just as different features may result in low power factor, depending on the product application, there are multiple ways to possibly correct power factor. Are there any thoughts on how a roadmap could achieve this by allowing for multiple pathways?

I don't see any comments in the room. Are there comments online?

MR. BAEZ: Yeah, I have a hand raised from Peter. Do you have another comment, Peter?

I do thanks. Peter Meaustindorp on behalf of the California IOUs.

I just wanted to return to this point. I don't know if there is a representative from ARRIS present that maybe could help explain this. But it was

suggested that power factor improvements, in their ITP response they suggested that power factor improvements wouldn't be as helpful as we might think because there is this combination of capacitive products, and they balance out the inductive products, like motors, you know, and refrigerators, and the like.

Electronics and motorized appliances exhibit sort of fundamentally different power factor problems. One, the electronics based on harmonic distortion, related to switch power supplies, as Pierre noted earlier, and the other related to displacement power factor issues. And they're somewhat different.

And to our knowledge, there's really no evidence to suggest that these loads balance each other out. We haven't seen the data on that or any research.

So, you know, we would encourage the CEC to continue -- that the Energy Commission continues examining both of these opportunities for power savings potential through power factor improvements.

MS. DRISKELL: That you, Peter. And I don't believe there is a representative for ARRIS in the room, although there may be online.

ARRIS REPRESENTATIVE: There is online. Can you hear me?

MS. DRISKELL: Yes, we can hear you.

ARRIS REPRESENTATIVE: Yeah, I would suggest the relationship is not perfect, but because one is leading and one is lagging there's an element of correction within there. And just looking at one part of the network will make a difference. It's not a whole solution, but it will make the network worse just from addressing half the problem.

As I say, it's not an entire solution, but it's certainly a step in the wrong direction.

MS. DRISKELL: We were having a little bit of difficulty hearing you in the room. If you could submit your comments to the docket, that would also be really helpful.

ARRIS REPRESENTATIVE: Okay.

MS. DRISKELL: Thank you.

Pierre?

MR. DELFORGE: Yeah, Pierre Delforge, NRDC. I also am skeptical of the claim that they somehow offset each other to some extent and I haven't seen any data. So, I would ask the representative from ARRIS to provide such evidence, so we can examine it and make sure that's the case.

MS. DRISKELL: Thank you, Pierre.

I think there are more comments online.

MR. BAEZ: Yeah, Chris Granda had his hand

raised online. Do you have a comment, Chris?

MR. GRANDA: Yes, thanks. I wanted to second the comments by Pierre Delforge and Peter Meaustindorp. But also note that the National Electrical Manufacturers Association has done some research in this area and has an updated report that came out in the last few years. Which, unfortunately, I'm not able to put my hands on right now. But I will, if you let me know where I can forward that to the appropriate person.

MS. DRISKELL: You can forward it to Soheila Pasha or to our docket. And I think Soheila's information will be presented at the end of the slides.

MR. GRANDA: Great, thanks.

MS. DRISKELL: Thank you, Chris.

MR. BAEZ: A hand raised from Peter. Do you still have a comment, Peter?

MR. MEAUSTINDORP: No, I apologize. I just need to un-raise my hand, it looks like.

MS. DRISKELL: Okay, I think that's all of the comments online.

On the cost and benefits analysis we received a few different comments. One commenter asserted that power factor correction results in a retail cost increase of about $3.00.

NRDC points out that the energy wasting costs of

poor power factor costs consumers money.

The IOU suggests considering upstream, grid-side power factor energy savings in addition to savings to the consumer. For example, there are upstream benefits from power factor improvement in reducing losses in distribution lines, and transformers, and in extending the life of system components like distribution transformers.

For discussion, should power factor correction be coupled with low power modes to improve the cost effectiveness of these efforts? Why or why not?

Eric?

MR. RUBIN: Eric Rubin on behalf of the California IOUs. The previous slide accurately captures our stance, which is that the two topics shouldn't necessarily be coupled.

One thing to particularly point out is that if the most appropriate approach for power factor is a vertical framework, then they definitely shouldn't be coupled.

MS. DRISKELL: Thank you, Eric.

Any comments online?

We requested information about test procedures for power factor. The IOUs commented that many power factor test procedures are specific to the appliance

type, such as for motors.

Two more generalized test methods would apply to power factor measurements and power supplies, both internal and external. Well, different ones for each one. But only apply to those products that have power supply, so not products with motors.

Some products already require power factor to be reported based on their specific test procedure. However, more testing guidance may be needed to develop horizontal test procedures.

Several test procedures may need to be pieced together to cover multiple products under a single power factor requirement.

Are there any additional test procedures or thoughts on test procedures that the Energy Commission should consider at this time?

I see no comments in this room. Are there any online? Okay.

For sources of test data NRDC submitted information about an EPRI report. That indicates significant energy savings, at least 240 gigawatt hours per year in California, from improvements to power factor.

That study focused on large loads, like televisions and desktop computers in active mode.

NRDC also submitted information about power factor in smaller loads, which I believe Pierre referred to earlier today. And these show those appliances in standby mode here.

The differences in the real and apparent loads for these appliances suggest significant potential energy savings from improving power factor.

Are there additional sources of test data that the Commission should consider?

I will not that the Commission's Modernized Efficiency Database system does collect some information on power factor specific to the appliances regulated.

I see no comments in the room. Are there any online? Okay, we'll move on.

We also requested information for modes of operation, duty cycle, product lifetime, market analysis, energy saving features, power factor correction techniques, specifically. Tradeoffs and solutions, impacts to small businesses, and market competition, and baseline energy consumption.

We didn't receive specific comments on these topics. However, this information may also be more readily available once we have a better sense of the scope for this roadmap. So, we look forward to receiving more information about specific power issues

here, along with the proposals and the invitation to submit proposals part of this rulemaking, and as we move through the roadmap.

I'll open it up at this time for any general comments that anyone present or online wishes to make related to either low power modes, or power factor, or both.

Mary?

MS. ANDERSON: Mary Anderson from the California IOUs. The Statewide Case Team strongly supports the Energy Commission's decision to include low power mode and standby power as a roadmap topic.

As NRDC showed, in the home idle load study, 23 percent of residential electricity used in California is by products in low power mode, and products left in active mode while not being used.

So, there is a large potential savings opportunity. And the Statewide CASE Team supports the Energy Commission's suggestion to regulate low power modes using a horizontal approach, and encourages the Energy Commission to consider auto power down opportunities as part of the low power mode roadmap. Thank you.

MS. DRISKELL: Thank you, Mary.

Are there any comments online?

MR. BAEZ: Alex Boesenberg, online, has his hand raised. Would you like to comment, Alex?

Yes, I would like to submit, for consideration, that all of these comments about power factor and the interest in it is -- while it is appropriate, no one seems to have any definitive studies of the actual dynamics, and the situation as it exists in the grid and the various places on the grid.

I hope the Commission will consider performing these studies, rather than take action based on a lot of people's well-intended but, potentially, uninformed input. Thank you.

MS. DRISKELL: Thank you, Alex.

Mary has her hand raised in the room.

MS. ANDERSON: So, this is Mary Anderson, PG&E. I appreciate Alex's comment on the lack of data. As part of our field study we will be collecting -- for specific products, we'll be collecting power factor to allow us to get a better idea of what the potential is and what the potential problems are, and submit that to the docket to allow the Commission to make appropriate and well-informed decisions on this topic.

MS. DRISKELL: Thank you, Mary.

Are there additional comments online?

MR. BAEZ: Online, Chris Granda, you have your

hand still raised. Did you have an additional comment?

MR. GRANDA: No, sorry.

MS. DRISKELL: All right, that's all the comment we see.

I'll go over some next steps. So, following these workshops the Energy Commission will be requesting proposals for efficiency standards or measures, or actually in this case for roadmaps.

Proposals may be submitted between two days ago -- three days ago and September 1st. So, they're due 5:00 p.m., September 1st.

The proposal template and guidance is available online and there will be a webinar on August 1st to go over the template, and what we're requesting through the invitation to submit proposals.

And, of course, Commission staff are available at any time to discuss questions and concerns about this proceeding.

We are very early in this process. We're at the Invitation to Participate Workshop. So, there's a lot of time to continue with public participation and input into the roadmap proceeding.

For any other discussion or comments, please don't contact me. Please contact Soheila Pasha. Her contact information is shown here. You may also submit

written comments to the docket at 17-AAER-12.

All right, thank you everyone. I'm going to invite Ryan back up here to take the next topic, potentially.

MR. NELSON: Thank you, Kristin. Let's take a 10-minute break and we'll come back at the top of the hour. Or, I guess, it's just 11 minutes. So, we'll start again at 11:00. Thank you.

(Off the record at 10:49 a.m.)

(On the record at 11:00 a.m.)

MR. NELSON: So, I'm going to hand it over to Pat for solar inverters.

MR. SAXTON: Hello, everyone. My name is Pat Saxton. I'm an engineer in the Appliances Outreach and Education Office, with the Efficiency Division. And this is the solar inverters roadmap topic.

Today we'll be covering the overall purpose, the responses to the invitation to participate, the information the Commission requested, and the responses received. We'll have a time slot for general comments and then we'll cover next steps.

So, the Commission is gathering information for Phase II products for appliance efficiency regulations. And in the case of solar inverters, an efficiency roadmap. The invitation to participate is an

opportunity for stakeholders to provide information and data that help to shape the Commission's policy regarding these appliances.

The specific items for Phase II are commercial fans and blowers, expanded scope for general service lamps, spray sprinkler bodies, tub spout diverters, irrigation controllers, set-top boxes, low power modes and power factor. And then solar inverters is cut off there.

And I don't know how to resize the screen. We'll see if we can fix that. There we go. Perfect. Thank you, Ryan.

So, during this portion of the workshop we will discussion the information and data that has been submitted for solar inverters and the corresponding roadmap.

The only response received to the invitation to participate was from the California Investor-Owned Utilities.

The categories that the information -- the categories that the Commission requested information for were product definition and scope, test procedures, market characteristics, product lifetime, and potential efficiency regulations.

So, for the first category, product definition

and scope, there seems to be -- beyond just the comments received here, I think there's broad consensus that inverter product categories should be micro, string, and central inverters.

The IOUs commented that module level power electronics, such as power optimizers, should also be considered as a product category in the roadmap. And some of the supporting reasons for that is because they have a significant market share in the U.S. residential market segment. And they can also provide distinct and unique functionality from inverters.

We'll pause for comments on product definition and scope.

Carlos, do you have anything online? Okay.

Oh, yes, Charles?

MR. KIM: Charles Kim, Southern California Edison Company, on behalf of California Investor-Owned Utilities.

Solar inverter plays a vital role for meeting California renewable energy goals. And also, it is an enabling took for achieving zero net energy homes by 2020. And this effort is led by the California Energy Commission.

And because of this high importance, statewide impacts, and et cetera, California Energy Commission and

the Public Utilities Commission, and many other stakeholders are looking into a solar inverter, and in PV system, and et cetera.

And so, I believe that scope, the roadmap concept is very appropriate and I'm very thankful for CEC for including these topics in this Phase II rulemaking.

And I want to make specific comments about the scope. Since there are so many agencies looking into this, coordination and collaboration are very important.

CPUC have integrated distributed energy resource at this moment and they have a draft action plan. And one of the milestone on that action plan is by 2020, which coincides with ZNE residential, new construction to be ZNE, they have a 2020 vision of introducing smart inverters and functionalities, et cetera.

And, therefore, CPUC, under the direction of the CPUC there are smart inverter working groups formed, and they have also specific milestones as well. And right now they have Phase I completed. It has auto functionality requirement defined. And all solar inverters, by September 8th of this year, year 2017, must be smart inverters. And they have spelled out those functionalities in that Rule 21, regulated by the CPUC.

On the Phase II, March of year 2018, they're going to spell out the communication protocols that are needed to be a smart inverter.

And Phase III, the date has not been determined, yet, but they're going to define the (inaudible) of those smart inverters.

And I want you to take a close look at the one more item. It's called a DC-coupled inverter. Because of ZNE and because of over-generation, because of interconnection requirements in operation end, and all the functionality associated with the smart inverters agencies, including Title 24 team of CEC, is looking at how PV can be integrated with the batteries. Locally, behind the meter.

So, DC-coupled refers to the inverter that manages both solar panels, as well as batteries inside of homes, and commercial buildings, and et cetera. So, special attention needs to be given for those DC-coupled batteries, as well.

And for the scope, I want to make it a little more clear saying that when we say solar inverters, in September of this year California adopted smart inverter as a functionality. So, we may include those specific terms in the scope of this roadmap activity.

So, once again, I really appreciate the CEC

taking the leadership on this measure. And that I believe the roadmap concept, because there are too many moving balls, and many other agencies are looking into this measure, that's one, defining functionalities which has not been determined yet, fully. So, once again, collaboration and coordination is important. So, the roadmap concept is perfect for that. Thanks so much.

MR. SAXTON: Thanks for those comments, Charles.

Any other on definition and scope?

MR. BAEZ: Online, Chris has his hand raised. Chris, did you have a comment?

MR. GRANDA: Just very briefly. I don't really have anything to add to Charles' comprehensive comments, but other than to support them completely. We're talking a rapidly expanding and evolving product category, and with an increasing range of functionality. And it's important that we make sure we get that all covered. Thank you.

MR. SAXTON: Great. Thanks, Chris.

Okay, moving forward. The Commission inquired about available test procedures that would cover both across product categories and functionality.

The IOUs identified three existing inverter test procedures. A European standard, EN 50530, for overall efficiency of grid-connected photovoltaic inverters.

IEC-61-683, an international standard for power conditions, and a procedure for measuring efficiency.

And the Sandia/California Energy Commission Performance Test Protocol for evaluating inverters used in grid-connected photovoltaic systems. I'll note that that document is a draft and dated October 2004. It's certainly been quite a bit in practice, but could use some modernizing.

To my knowledge, none of these three test procedures is comprehensive across every category and functionality. So, perhaps a combination of these might be necessary.

We'll pause again for comments.

MR. WORTH: Chad Worth on behalf of the IOUs. I agree with your comments that it's a little -- there are some gaps in the existing test procedures. And one item that we've heard that I think is a growing market, that really has a gap, is the DT-coupled inverters and how manufacturers are able to display the efficiency of those. It's an emerging market and perhaps growing, but definitely a gap in terms of how that information will be communicated to customers going forward.

MR. SAXTON: So, Chad let me make sure that I'm understanding you correctly. You think that the existing test procedures don't sufficiently characterize

efficiency for DC coupled inverters or they do it in a way that's not clearly communicative to consumers?

MR. WORTH: From what I understand and we're still digging into this more is that the CEC test procedure is not appropriate for the DC-coupled inverters. I guess there have been some representations where people have tried to use that test procedure, from what I understand, but it sounds like everybody may be doing it a little differently.

MR. SAXTON: Okay. Yeah, thanks for the clarification. I would definitely agree with that.

Yes, Charles?

MR. KIM: Operation of DC-coupled inverter has not been clearly defined. For example, PV solar, if there's over-generation is going to be charging the batteries. And then this might get into the different mode of the operation.

Or, simply a price mechanism may be better to sell electricity to the grid, and et cetera.

So, those roles have not been clearly defined, yet, that determines which mode that this inverter is in. So, when those modes are defined for grid-connected inverters, it might help us to define test procedures more clearly to accommodate that.

MR. SAXTON: Okay, thank you.

Any additional comments in the room or online?

The Commission also asked about market characteristics and, specifically, if Publicly-Owned Utilities in California were also applying the requirement that inverters begin complying with UL 1741 supplemental assessment for autonomous functions that Charles had mentioned earlier.

The IOUs looked at several of the larger POUs, including SMUD, and it was clear that SMUD has aligned themselves and is requiring UL 1741.

For the Los Angeles Department of Water and Power, they have several overlapping interconnection requirements. And although it appears unlikely that they are requiring UL 1741 SA at this time, was not -- they were not able to determine that with complete certainty.

And the other 43 electric POUs have not yet been fully reviewed.

I guess one note I would make is regardless of the requirements of any individual POUs, the market may not be providing any other inverters once 1741 SA becomes a requirement in IOU territories. So, that's something that we will all keep looking for information on.

The Commission also asked what activity was

happening in the other states around smart inverters.

And the IOUs noted that Hawaii has begun requiring inverters that comply with UL 1741 SA and has also required additional functionality for remote operation and configuration.

The IOUs also identified two separate pilot programs in Arizona, at Arizona Public Service and the Salt River Project, which are studying smart inverter functionality in order to better understand both grid impacts and operations.

The Commission asked about data sources for market availability of smart inverters. The IOUs noted the website at California Distributed Generation Statistics, which has extensive data for PV systems that have been interconnected in IOU territories.

And that data identifies the specific inverter and the quantity of inverters that have been installed at each interconnected PV system in IOU territories.

The Commission had asked about the involvement of small businesses in this market sector. And the IOUs noted that smaller businesses tend to be involved in sales and installation, rather than manufacturing.

I'll pause for any comments on the market characteristics items.

Okay, seeing none we're going to move forward to

product lifetime. The Commission had asked about identifying product lifetime for inverters, both across various equipment categories and any other defining characteristics.

The IOUs supplied information using manufacturer warranties as a proxy for product lifetime and noted that it does differ by product category.

For micro inverters, manufacturers' warranties often ranged from 20 to 25 years. Whereas for string and central inverters it's 10 to 12 years.

Again, we'll pause for comments.

The Commission inquired about the benefits of several potential efficiency regulations. One was the perceived benefits around a potential for testing and reporting requirements.

The IOUs commented that this would fill any data gaps that begin to emerge as the California Solar Initiative phases out.

The Energy Commission asked about the potential for maximum power point tracking efficiency requirements.

And the IOUs noted that this would provide information on how system configuration and equipment variation impact MPPT efficiency.

The Commission had previously noted that

conversion efficiency was quite high in inverters and asked what would be the potential benefits of efficiency standards because of this.

And the IOUs noted that due to the size of PV market penetration in California and the continued growth of PV penetration that even a small increase in conversion efficiency would have substantial benefits.

And finally, the Commission had inquired about limiting self-consumption during nonproductive hours, essentially standby.

And the IOUs noted that these losses are not captured by typical inverter performance metrics and that those losses may have a disproportionate impact since they're occurring when the power mix in California has a lower renewable content, meaning nighttime.

The IOUs also noted that the Energy Star specification for electric vehicle supply equipment might be a model for structuring a requirement on standby losses.

We'll pause for comments.

MR. WORTH: Chad Worth on behalf of the IOUs. I just want to point out, in our preliminary analysis we've been using the California DG Stats database, and cross-referencing it with the CEC inverter efficiency database. And perhaps not surprising, and promising,

generally inverter efficiency is improving over the years. And nighttime tare losses or standby losses have shown somewhat to be decreasing which points to what you would expect with a technology like this, where there's a very strong market incentive to generate as many kilowatt hours as possible from a solar system.

We're continuing to refine this data matching. But we are, with this product class, fortunate to have a rich sales-weighted database of the installed stock in California. And we'll continue to analyze that and provide more information in our comments.

MR. SAXTON: Thanks, Chad.

Any additional comments in the room or online?

The IOUs did note other relevant regulatory activity. And specifically that energy metering tariffs continue to evolve. And that the California Public Utilities Commission's proceedings should be monitoring as this has the likelihood to impact the market for inverters. The Energy Commission definitely agrees with that comment.

And also that the Smart Inverter Working Group is still active and that their efforts will result in additional changes to the Rule 21 interconnection requirements for Investor-Owned Utility territories.

As noted previously, the Phase I autonomous

functions become mandatory in IOU territories beginning this September.

The Phase II communication protocols have already been incorporated in Rule 21, with a to-be-determined effective date.

And the working group continues to examine additional advanced inverter functionality through Phase III and their recommendations will be forthcoming.

I'll pause for any comments.

MR. WORTH: Chad Worth, on behalf of the IOUs. One other relevant activity that we've become aware of and it would be good to coordinate with, as well as the updates to the National Electric Code and some of the safety, automatic shutoff requirements that are emerging in this market that appear to be shifting, further shifting the market towards module power level electronics.

MR. SAXTON: Yes, I definitely agree, Chad. Thanks for noting that.

Okay, that concludes the individually noted items. We will open for any general comments for issues that have not been covered.

Carlos, anything online? Okay.

So, the next steps following the invitation to participate response workshop that we're having today is

that the Commission is requesting proposals for efficiency standards or measures. Or, in this case for solar inverters it will be a roadmap.

The proposal template and guidance is actually online, with proposals due to the Commission on September 1st.

There's a webinar regarding those proposals on August 1st and that might be a good time to raise questions about the difference in the template for a roadmap versus standard.

But in general I would think it includes, obviously, scope and framework, but checkpoints along the way that would be incorporated into the roadmap.

Commission staff's available to discuss questions and concerns at any time during the proceeding.

We are very early in the process. There will be multiple opportunities for additional public comment as we go along.

My contact information is on the screen here and comments can also be submitted to the docket, 17-AAER-13.

And unless there are any additional comments, thank you for your time.

MR. NELSON: Thank you, Pat. We will take a

break for lunch. We'll reconvene at 1:00 p.m. with the next topic. So, we will hopefully have a little longer lunch break and we'll see you back this afternoon. Thank you.

(Off the record at 11:25 a.m.)

(On the record at 1:01 p.m.)

MR. NELSON: Welcome back. We will begin the afternoon session here shortly. I'm not sure if there's anybody new in the room, but I'll do the introduction one more time and that should be it for the afternoon.

Our next topic will be set-top boxes followed by general service lamps.

Please use the entrance and exit that you used when entering the building this afternoon and this morning. The one out here is alarmed. If you use that exist, the alarm will go off. And in case of emergency use either exit and we will meet across the street, diagonally in the park.

Restrooms are located directly across the lobby, well, to the left across the lobby. And there's a snack bar upstairs, up the central stairs, on the second floor, in the back left corner, if you need water, or a beverage, or a snack.

So, throughout the presentations this afternoon, after a topic is discussed the presenter will open the

floor for comment. We'll take comments first from the room. If you're in the room, please come up to a microphone at the tables in front of you. If the green light is not illuminated, please press the button to turn on the mic. State your name, and organization, and make your comment.

If you're online, please use the raise your hand feature and we will call your name. Please state your name again, and your organization, so the court reporter can get the comments correct on the transcript.

If you're having issues with the phone, you can use the chat box through the WebEx application and we will try to get to your comment as best we can.

Again, if you have confidential information, please contact staff. The Energy Commission has a process of handling confidential information. Be aware that confidential information cannot directly support rulemaking. We have to aggregate it or figure some way to get it into the public record.

However, if you do have confidential information, feel free to contact us.

Now, I'm going to hand it over to Sean Steffensen.

MR. STEFFENSEN: Good afternoon. I'm Sean Steffensen with the Efficiency Division.

The flow chart addresses why we request information and how we plan to use it. We need the information to define the problem. In this case, an inefficiency.

The information provided helps, then, to define the solution. The scope and definition provide the what of what will be included in the standard.

How do we know what will and will not be subject to the regulation? The efficiency metric provides the measure by which we can rank the performance of the individual products. There can be more than one efficiency metric to consider. One or more may be chosen to develop a standard.

The test method defines the conditions under which the appliance is tested. Test data identifies the relative performance among products and allows consideration of a standard.

Once these items are selected, scope, definition, test method, test data and standard, an analysis must be performed to understand the effect of the proposed standard.

Does the standard achieve the goals of significant water and energy savings, while being cost effective and technically feasible?

If so, then it is a good standard. If not, then

we should reconsider the data and modify the standard to meet the criteria. Thank you.

MR. NELSON: Thank you, Sean.

So, on the screen now is a diagram of the rulemaking process. We're currently where the blue arrow indicates, the public workshop to vet the information submitted during the invitation to participate.

The next step will be the invitation to submit proposals, where stakeholders may submit proposals to the Energy Commission. That will be covered a little bit more through the presentations this afternoon.

On August 1st, we will have a webinar describing the process and going through the new proposal template. That's available online. So, please join us August 1st.

Now, I'm going to hand it over to Pat for set-top boxes.

My apologies, one second.

MR. SAXTON: Hi, good afternoon. I'm Pat Saxton. I'm an Engineer in the Appliances Outreach and Education Office. And I will be covering set-top boxes in this presentation.

We'll go through the purpose of this proceeding, the respondents to the invitation to participate, the information the Energy Commission requested, the

responses and information received. We will also have an opportunity for general comments and we will review next steps.

The energy gathering information for Phase II products, set-top boxes were specifically identified in the March 14th, 2012 order instituting rulemaking. Most of those products were examined for appliance efficiency regulations.

In this case, the Commission has taken the unusual step of indicating that we'll look at a roadmap for set-top boxes.

The invitation to participate is an opportunity for stakeholders to provide information and data that helps shape the Commission policy regarding Phase II appliances.

The specific categories that the invitation to participate requested information and data for are commercial and industrial fans and blowers, an expanded scope for general service lamps, spray sprinkler bodies, tub spout diverters, irrigation controllers, set-top boxes, low power modes, and power factor, and solar inverters.

During this portion of the workshop we will discuss the information and data submitted for set-top boxes.

The Commission received responses to the ITP from the following; the American Council for an Energy Efficient Economy, ARRIS Group, AT&T, DirecTV, Cable Vision, the California Cable and Telecommunications Association, the California Investor-Owned Utilities, Century Link, Charter Communications, Comcast, Consumer Technology Association, Cox Communications, Dish Network, EchoStar Technologies, The Natural Resources Defense Council, NCTA, the Internet and Television Association, Technicolor and Verizon.

The Energy Commission requested information in the following categories; product definition and scope, test procedures, sources of test data, market characteristics, product lifetime, installed base characteristics and product development trends.

Product definition and scope. Most commenters discussed the existing voluntary agreement and the potential renewal of the voluntary agreement. Some of those comments viewed the Commission roadmap as a parallel process to negotiations on the renewal of the voluntary agreement.

However, several industry comments implied a mutual exclusivity of the roadmap and the voluntary agreement, and also noted opposition to mandatory reporting requirements.

The Commission would just note that the presence or absence of a voluntary agreement does not impact the Commission's authority to investigate this topic and hold a roadmap proceeding.

Some comments mentioned small network equipment and the industry requested that the Commission exclude that small network equipment from the scope. But if the Commission does proceed, that they prefer small network equipment to be considered under the set-top box roadmap, rather than the low power roadmap that we talked about this morning.

Industry comments indicated a belief that preemption applies to cable set-top boxes. Energy Commission would like to note that we do not agree with that statement.

The California IOUs expressed support for development of a set-top box roadmap because additional savings remain available.

And the majority of comments agreed on aligning definitions with Energy Star Version 5.1 and the voluntary agreement.

We'll pause for any comments on product definition and scope.

Charles?

MR. KIM: Charles Kim, Southern California

Edison Company, on behalf of California IOUs. I'm very thankful that CEC is looking into a roadmap concept applied to the set-top boxes. I know the voluntary agreement expires very soon and there might be a new agreement that is on the horizon. But it creates an opportunity for us to pursue.

Because a number of products in California when it consists of set-top boxes, has been increasing. And they might, in some degree, offset the savings that I see through the new technology evolvement and energy-saving features that create a savings through the new devices.

I k now that set-top boxes can be very complex issues and the California IOUs look forward to support this measure, and then active engagement on this particular topic.

But I want to point out one key element. Some set-top boxes, maybe you are able to purchase it, but most of the consumers they are not. It comes as a part of the services.

So, in the context of this roadmap I want to see how we can address existing set-top boxes that has been used by our customers. Because legacy set-top boxes, they tend to use more energy and doesn't have advanced features that we see in the market today. And existing,

how to handle the existing set of boxes can bring significant energy savings and opportunities for Californians.

So, once again, I strongly support CEC taking into the roadmap concept on the set-top boxes. Thank you.

MR. SAXTON: Thanks, Charles.

Yeah, Bijit.

MR. KUNDU: Bijit Kundu, Energy Solutions, on behalf of the California Investor-Owned Utilities.

Just specific to the products definition and scope, we agree with aligning with Energy Star, the current Energy Star spec. The one clarification or item that we would like to see better defined, and the Energy Star specification defines set-top boxes as "Devices whose primary purpose is receiving video signals or services."

And we understand that there are devices called gateway devices, or gateway set-top boxes that may provide multiple services in addition to video. And we would like, at this early stage of the roadmap process, to make sure that they're considered in scope. Since most of the time these devices are always on.

And, of course, we'll be providing additional information at the appropriate time to CEC.

MR. SAXTON: Thanks for that clarification, Bijit.

Anyone else in the room? I think we did have someone online.

MR. BAEZ: Online we have Noah Horowitz. Noah, do you have a comment?

MR. HOROWITZ: Yes, this is Noah Horowitz with the Natural Resources Defense Council. I have more comments that will follow later, overall on the voluntary agreement.

But in terms of the scope, we think it's essential to include the main box that's going to be in the home, that's receiving and delivering, perhaps delivering the video around the home.

Sometimes this is called a server box or an internet access device, or a gateway box. Whatever it's called, this is likely to be the biggest energy-consuming set-top box in the home and we think it's imperative for it to be included in the roadmap that CEC is considering. Thank you.

MR. SAXTON: Anyone else, Carlos? Okay.

The Energy Commission requested information regarding the adequacy of the ANCII CTA-2043 test procedure. The majority of comments indicated a belief that it is sufficient and noted that Energy Star has

aligned with that test procedure.

The IOUs commented that a further study of how functions are enabled and disabled during setup and on mode might be appropriate to better understand if the test results reflect settings as used by consumers.

Again, we'll pause for questions or discussion.

(Pause)

For sources of test data, many commenters noted the voluntary agreement annual reports that are available. These showed that new set-top boxes have achieved significant reductions in annual energy. However, it was noted that gateways or internet access devices do not have reported data in the set-top box annual reports, but there may be some available in the report for the small network equipment, which is a separate voluntary agreement.

The URL in the second bullet is the website for information on individual devices that is part of the voluntary agreement. And it does have information about all the set-top boxes that are offered by service providers who are signatories to the VA. And that includes an annual energy consumption estimate for those boxes.

Other sources of information noted were the Energy Star certified product list and the forthcoming

2016 annual report for the voluntary agreement, which is supposed to be published this summer.

And there was general agreement among commenters that California-estimated savings can be established with a population weighting from the national savings estimates that are in these reports.

Again, we'll stop for comments.

(Pause)

MR. SAXTON: The Commission requested information on market characteristics. The following three studies were cited as providing information on the number of subscribers and the way that they are accessing content, such as the location, which device they're using, and the length of each access period.

Those first two are available freely and the third one is a report that would need to be purchased.

Multiple commenters noted that there's been an increasing number of whole home solutions and Cloud-based DVR services. And that t hose are resulting in significant savings.

Some comments also noticed that savings are increasing as the percentage of new equipment displaces old equipment. So that the percentage of new equipment is increasing relative to total equipment deployed.

There were several estimates of the number of

devices that are in circulation. The voluntary agreement indicated that -- excuse me, the annual reports from the voluntary agreement have indicated that about 122 million devices have been procured by VA signatories between 2013 and 2015. And that the upcoming 2016 annual report will estimate the percentage of devices that had been deployed since the beginning of the voluntary agreement in 2013.

This is a graphic from the 2015 voluntary annual report. It's indicating the change in weighted total energy consumption of several categories of set-top boxes. Including, DVR devices, non-DVR devices, thin clients, and then DTA is a category that is probably not particularly relevant for this discussion.

And finally, the California Investor-Owned Utilities submitted some information on duty cycle estimates. So, for several different categories of devices has an on-mode hours, multi-stream hours, and sleep hours. I think, and maybe the IOUs can clarify this, but for instance the 12.4 hours in the first box, for cable without DVR is actually the on-mode time of the device, not necessarily that the user was sitting in front of it for that long.

But, certainly, the Commission is interested in agreement or additional information with these duty

cycle estimates.

We'll pause for comments.

Yeah, Bijit?

MR. KUNDU: Bijit Kundu, Energy Solutions, on behalf of the California IOUs.

This information that we submitted was from an older Department of Energy field metering study, I think conducted in 2011. I might be getting the year wrong there. So, that was the only information we were able to find at the time.

We do know that as part of the voluntary agreement what is submitted by service providers are modal power draw, as well as annual energy consumption, and the energy consumption calculations that are used for each purchased set-top box.

And so, we know duty cycle information is out there and we would encourage data sharing with CEC, through the confidential process that was referenced earlier. We would like to encourage that.

MR. SAXTON: Thanks for those comments.

MR. KUNDU: For this roadmap process, yeah.

MR. SAXTON: Kristin?

MS. DRISKELL: This is Kristin DRISKELL from the Appliances Office. I actually have a question for PG&E regarding their field study that was mentioned earlier

in this workshop. Does the field study include metering of set-top boxes?

MS. ANDERSON: This is Mary Anderson from PG&E. Yes, it does. We will have delineated information by type of set-top box, as well as just overall metering.

MR. SAXTON: Any additional comments in the room?

MR. BAEZ: Online, Debbie Fitzgerald has a comment. Debbie, would you like to comment?

MS. FITZGERALD: Yes, I just wanted to clarify that the typical energy consumption values that are used in the voluntary agreement reporting is based on the same formula that is provided in the Energy Star Version 3 program. And then going forward for tier two, it's the same duty cycle formula that is actually called out in the voluntary agreement document, itself.

So, those are publicly available, the tier one values are in the Energy Star Version 3 test procedures. And the tier two duty cycle is available in the VA document, itself.

MR. SAXTON: Thanks, Debbie.

MR. BAEZ: Another hand raised from Noah Horowitz. Did you have another comment, Noah?

MR. HOROWITZ: Yes, Noah Horowitz with the Natural Resource Defense Council.

In terms of the energy use overall statewide, we think it would be interesting to see if there's a way of better tracking the national and thereby the California set-top box energy use within a year. Right now there isn't stock data available, so there's some various assumptions being made. And with greater granularity or insight in terms of are DVRs being replaced or not, and in some cases we might be getting greater savings as there are solutions that allow you to receive service through an application and completely get rid of the boxes, which is both good for the consumer and for the environment.

So, we're wondering if there's some way to access that data through the roadmap or voluntary agreement process. And there should be a way to do that and still preserve the confidentiality of companies' inventories. Thank you.

MR. SAXTON: Thanks, Noah.

Anyone else, Carlos? Okay.

The Commission requested information on product lifetime of set-top boxes and specifically if that differed by equipment type or customer class.

There was general agreement among commenters that product lifetimes ranged from five to seven years.

Industry indicated that it's difficult to

generalize between any -- excuse me, industry indicated it's difficult to make generalizations that are segmented by equipment type or customer class. They also noted that some customers have been proactively requesting new equipment.

And there was a suggestion by industry requirements that large-scale, early requirement could have negative environmental consequences.

We'll take any comments on product lifetimes, now.

The Commission requested information on installed base characteristics for set-top boxes.

Commenters submitted a range of estimates for existing national stock. One end of those submittals was 227 million devices, which came from the 2015 Voluntary Agreement Annual Report. And the high range was 361 million devices, which came from a 2013 Fraunhofer Report.

The California IOUs indicated that market reports are available for purchase that includes projections of future shipments, along with current stock information.

Several of those that were cited were S&P Global Market Intelligence, Grandview Research, and IHS Market.

The voluntary agreement annual reports do not

have data on the specifics of how installed stock is changing or if older set-top boxes are being permanently retired. This is somewhat similar to the comments that Noah Horowitz just made.

We'll take any comments on installed base characteristics.

Bijit?

MR. KUNDU: Bijit Kundu, Energy Solutions, on behalf of the California IOUs. In terms of installed stock, we understand the voluntary agreement does not address existing installed stock. So, based on the discussion earlier, the CASE Team will be providing CEC with additional information based on the PG&E Codes and Standards Field Study to at least give some idea of what the installed stock is within the PG&E territory.

MR. SAXTON: Great, thank you.

Have we got an online comment?

MR. BAEZ: Noah, we see that your hand is still raised. Do you have another comment?

MR. HOROWITZ: I don't and I put my hand down. Thank you.

MR. SAXTON: The Commission requested information on product development trends for set-top boxes. As noted earlier, there's fewer DVR and traditional set-top box installations occurring.

There's been an increase in thin clients and internet protocol televisions, or IP TVs. There's also been an increase in over-the-top content viewing without a set-top box.

There's been some level of improvement in light sleep and auto power down for certain devices. There has definitely been an increase in whole home solutions and Cloud-based recording, as well. There's also been some movement on next generation power management.

The 2015 Voluntary Agreement Annual Report estimated that 32 and a half million cable set-top boxes now have light sleep capability, with many of these having received over-the-air updates to effect these changes.

We'll take any comments on product development trends.

And then, we will take any general comments on topics that we did not cover.

(Pause)

MR. SAXTON: We've got no one in the room, no one online. Oh, Noah.

MR. HOROWITZ: Yes, this is Noah Horowitz from NRDC. But are there any industry participants that want to speak, I'll allow them to go first and I can follow, if that's helpful.

MR. SAXTON: I don't think we see any hands raised online, Noah, and we don't have anyone in the room waiting to make a comment. Go ahead.

MR. HOROWITZ: I guess I'm good, then, at this point. Thanks.

MR. SAXTON: Okay, thank you.

So, following today's workshop the Energy Commission requests proposals for efficiency standards or measures. Or, in the case of set-top boxes, a roadmap.

The proposal template and guidance is actually online now. There will be a webinar on August 1st and that might be a good time to discuss the differences in proposals between products that are being examined for efficiency standards versus products that are being examined for a roadmap.

Commission staff remains available to discuss questions and concerns at any time during the proceeding.

We do remain at a very early step in the process and there will be multiple additional opportunities for public comment.

And my contact information is on the screen, and the docket at 17-AAER-11 is also open for comment -- to receive comments.

Okay, thank you.

MR. NELSON: Thank you, Pat. We'll take a 5-minute break and we'll come back and start our last topic of the afternoon.

(Off the record at 1:34 p.m.)

(On the record at 1:44 p.m.)

MR. NELSON: Welcome back, everybody. Just to reiterate, we will take comments. There will be breaks in the presentation to take comments and open it up for discussion.

To make a comment in the room, please address a microphone. Some are always on, with the light illuminated, some are not. So, if it's not lit up, please press the button.

Online, use the hand function and we will call your name. Please state your name and your organization for the court reporter. And if that does not work, you can use the chat box.

Okay, I'll hand it over to Pat.

MR. SAXTON: Hello, I'm Pat Saxton. I'm an Engineer in the Appliances Outreach and Education Office. Just in case anyone's not tired of my voice, yet, I will be presenting on the general service lamps expanded scope item.

Today we'll cover the purpose of the proceeding,

respondents to the invitation to participate, the information requested by the Energy Commission, the responses that were received, and the information contained within them. We'll have a period for general comments and we will cover next steps.

The Energy Commission's gathering information for Phase II products for Appliance Efficiency regulations. The invitation to participate is an opportunity for stakeholders to provide information and data that will help shape Commission policy regarding these Phase II appliances.

The ITP requested information and data on the following product categories; commercial and industry fans and blowers, general service lamps expanded scope, spray sprinkler bodies, tub spout diverters, irrigation controllers, set-top boxes, low power modes, and power factor, solar inverters.

During this portion of the workshop we will discuss the information and data submitted for general service lamps expanded scope.

The Commission received ITP responses from the following; the Alliance to Save Energy, the American Council for an Energy Efficient Economy, the Appliance Standards Awareness Project, the California Investor-Owned Utilities, Consumer Federation of America,

LEDVANCE, the National Electrical Manufacturers Association, the Natural Resource Defense Council, the Northeast Energy Efficiency Partnerships, the Northwest Energy Efficiency Alliance, the Sacramento Municipal Utility District.

The categories that the Energy Commission requested information for were product definition and scope, market characteristics, and installed base characteristics.

Regarding product definition and scope, many comments, most comments expressed support for adopting the definitions from the two final rules from the Department of Energy, U.S. Department of Energy, I should say, as published in the *Federal Register* on January 19th, 2017.

The reasons cited for that support were that they increased energy and cost savings, and closed loopholes.

Two industry comments did not support the expanded scope. Several comments recommended a further expansion of scope by reducing the lower lumen output of the products that were proposed to be covered to better align with State-regulated, LED lamp regulations. This is specifically 150 lumens for candelabra-based lamps and 200 lumens for State-regulated LEDs. Whereas the

DOE final rules use 310 lumens.

Several commenters noted that the DOE final rules include additional product definitions, such as those for black light lamp, colored lamp, and appliance lamp that must be considered simultaneously. We'll note that the Energy Commission agrees with this comment.

Two industry organizations commented that the topic should be delayed until the U.S. DEO acts on NEMA's request to complete a general service lamp rulemaking.

Additionally, NEMA has or had petitioned for a judicial review of the two DOE final rules. NEMA and DOE agreed to an out-of-court settlement on July 7th, 2017. And this will likely result in DOE opening rulemakings that do affect this topic.

Industry comments further opined that California's regulations for LED lamps, small diameter directional lamps, and the 45-lumen-per-watt backstop for general services lamps, in their opinion are not effective beginning January 1, 2018 because of preemption.

However, the Energy Commission notes that a regulatory advisory for lamps was published on March 30th, 2017, confirming that three California regulations on lamps will be effective for lamps manufactured on or

after January 1, 2018. And that advisory is available at the web link.

Several commenters recommended an effective date for an expanded scope to be as early as possible in order to achieve incremental benefits prior to the January 1, 2020 effective date.

Several commenters cited the Lawrence Berkeley National Lab's analysis of the national impact from the updated general service lamp definitions for savings estimates.

That LBNL report is in the docket for this proceeding, if anyone needs access to it.

Some commenters suggested weighting the national impact by population or housing units to estimate the California impact.

If you apply the housing units estimate to the LBNL national estimate, the California savings would be approximately 2.8 quadrillion Btus, with a net present value in the range of 12 and a half to 22.9 billion dollars.

A quad saving estimate is not used by the Energy Commission very often, so I will note that that is for the full fuel cycle, not just the end use.

We will pause for comments on definition and scope.

(Pause)

MR. SAXTON: Carlos, do we have anyone online? Okay.

The Commission did request market characteristic data. Multiple commenters cited the NEMA Lamp Indices as a data source for market trends.

Commenters cited the broad availability of LED versions of lamp types that would be covered under an expanded scope.

I'll note that the Commission remains interested in the availability of LED lamps that would also meet California regulations, which become effective on January 1, 2018.

Multiple commenters noted the significant decline in LED prices over the last several years. The Investor-Owned Utilities, specifically, submitted data for the time period of December 2013 to April 2016. That includes 1,600 unique price points per month from nine online retailers. And it showed that lamps with 80 to 90 lumens-per-watt efficacy had the lowest prices.

We'll take any comments on market characteristics.

(Pause)

The Commission requested information on installed base characteristics of lamps that would be

covered by an expanded scope.

Again, commenters recommended use of the LBNL analysis in order to determine estimates of the California existing stock. They also cited this report as having estimates of the average daily hours of lamp use by type.

That LBNL analysis estimated that the -- they used the phrase, "non-ISA explicit lamp types" to indicate products that would be covered by the expanded scope. And that they have a nationwide installed stock at least 80 percent as large as the stock of ISA explicit lamps.

Again, commenters suggested weighting these national stock estimates by either population or housing units to estimate the California stock.

And for hours of lamp use for residential, they ranged from 1.7 to 2.9 hours of use, depending on lamp shape which was used for a proxy of the room that the lamp was installed in.

And for commercial, they estimated usage of 10.7 hours per day.

And we'll take any comments on installed base characteristics.

(Pause)

And then, we will take any general comments on

topics that were not raised specifically.

MR. BAEZ: Online, we have a hand raised from Noah Horowitz. Do you have a comment, Noah?

MR. HOROWITZ: Yes. This is Noah Horowitz, with the Natural Resources Defense Council.

We want to reiterate our support and the importance of the Energy Commission adopting the federal definition for general service lamps as defined in the *Federal Register*, in January of 2017.

We think this is needed in order to close loopholes that could significantly erode the savings in categories such as three-way bulbs, and shadow-resistant bulbs, where an inefficient bulb could really grow in sales and erode a lot of the savings.

And the new definition would also bring in reflector lamps greater than two and a half inches that would deliver significant incremental savings to the State, and its consumers.

So, in summary, we encourage the CEC to move forward with this docket and with its regulations that go into effect on 1/1/2018. Thank you.

MR. SAXTON: Thanks, Noah.

Any other comments in the room or online?

MR. BAEZ: Online, Alex Boesenberg has his hand raised. Go ahead and comment, Alex.

MR. BOESENBERG: Thank you. I want to thank the Commission for the opportunity to comment. Of course, NEMA has already submitted written comments, previously, which were cited in the presentation.

But once again, we wish to express that we believe that the inclusion of the definition of a general service lamp, such as defined on January 19th, 2017, is actually already accomplished by virtue of the existing definitions in Title 20.

We note that Title 20, Section 1602(k) already contains a definition of a federally-regulated general service lamp that mirrors the Congressional definition in 42 U.S. Code 6291(30).

In the Regulatory Advisory, from the Commission on March 30th, 2017, the Commission states that the yet-to-be-determined definition of a State-regulated general service lamp is identical with the federal definition.

And those both contain the text, "Any other lamps that the Secretary determines are used to satisfy lighting applications traditionally served by general service incandescent lamps."

But in that January 19th rule, from the Department of Energy, the Secretary published determinations that a number of other lamps are used to satisfy lighting applications traditionally served by

general service incandescent lamps.

So, at this time, those lamps are already part of the federal definition, general service lamps. And by virtue of that, the State's definition of federally-regulated general service lamps and there is no further action necessary by the Commission.

We maintain our view that there are no State-regulated general service lamps, there are only federally-regulated general service lamps and there is no need for a definition of State-regulated general service lamps.

And again, we refer anyone interested to our comments on the record. Thank you.

MR. SAXTON: Thank you, Alex.

MR. BAEZ: All right, another commenter online, Chris Granda. Go ahead, Chris.

MR. SAXTON: Chris, if you're trying to speak, we're not able to hear you.

MR. BAEZ: All right, one more online, Richard Greenberg. Go ahead, Richard.

MR. GREENBERG: Hi, this is Richard and my question pertains to not just what Alex just mentioned, which was very informative, but to the time it will take to make a final determination on this topic. Because if it turns out to be that excluded lamps in the previous

definition are still fair game in the market. For example if on January 1st, 2018 the R-30s of the halogen variety are available on the shelves, then they could serve as a viable baseline for particular LED products, rather than an assumption that they're not replacing halogens at all in the baseline.

So, I'm interested in seeing the DOE standards adopted, but I'm also interested in making use of any viable energy savings for claims for the utilities, until that comes into effect.

MR. SAXTON: Okay, thanks for that comment, Richard. I agree, there is a lot of overlapping pieces and they're all in movement at the same time. It would be good to have data and information to clarify any of those positions.

Do you want to try Chris, again?

MR. BAEZ: Hi, Chris, go ahead. We'll try one more time. You're unmuted, if you have another comment.

MR. SAXTON: Chris, we could also pause for a second if you want to type something in the chat box, quickly. Okay.

So, following this workshop the Energy Commission has requested proposals for efficiency standards or measures. Those proposals are due September 1st.

There will be a webinar to discuss the template for those proposals on August 1st. And the template and guidance are actually online, now.

Commission staff remains available to discuss questions and concerns at any time during this proceeding.

This is just a reminder that we're very early in the process for Phase II appliances. There will be multiple opportunities for additional public comment and input.

My contact information is on this slide, and also Docket 17-AAER-07 is open to receive comments.

Yes, we have one more question or comment in the room.

MR. SERRES: Yeah, Anthony Serres, Philips Lighting. Just to understand, I had the impression that this was about expanding the scope to include like what the DOE was doing.

But when I hear about what you're looking for on September 1st, you're actually looking for possible standards for other lamp types, or something?

I thought this was just about expanding the scope. So, can you clarify what exactly is being sought for September 1st?

MR. SAXTON: Sure. So, that is the Energy

Commission's initial proposal would be to match the federal rules from January 1, 2017. I guess this is the opportunity for stakeholders to submit alternatives.

MR. SERRES: Okay. That's clear. Thank you.

MR. SAXTON: You're welcome.

We also do have Chris Granda, from the Appliance Standards Awareness Project was able to submit something to the chat box. "The Appliance Standards Awareness Project supports the position that the Energy Commission should adopt the definition for GSLs contained in the final rules issued by DOE in January of 2017. This revised definition significantly increased the savings expected from the Federal GSL Standard, and will do the same for the California State GSL Standard."

That's for the comment, Chris, and apologies for the technical difficulties.

And we have one more online, as well.

MR. BAEZ: Richard Greenberg, we see that your hand's raised. Do ahead, Richard.

MR. GREENBERG: I'm sorry, my hand was not raised. I didn't click the hand to get it un-raised. So I don't have any more comments. There you go.

MR. SAXTON: Okay, thanks everyone. One last opportunity in case anyone else had anything they'd like to add. Then I guess that is it for the day. Thank

you, everyone, for your participation.

(Thereupon, the Workshop was adjourned at 2:05 p.m.)

--oOo--

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 7th day of August, 2017.

_____

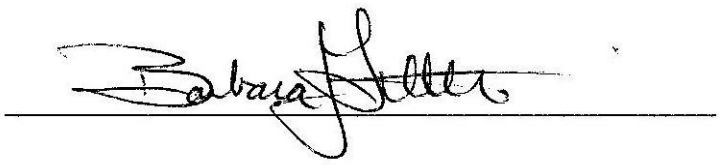
Eduwiges Lastra
CER-915

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 7th day of August, 2017.



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