DOCKETED

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CALIFORNIA ENERGY COMMISSION

STAFF WORKSHOP

In the Matter of:	) Docket No. 17-AAER-01
	) Docket No. 15-AAER-02
	)
	)
	) Staff Workshop RE:
	) Regulations for Pool
Appliance Efficiency Pre-Rulemaking	) Pumps and Motors,
For Pool Pumps and Motors, Portable	) Portable Electric
Electric Spas, Commercial Clothes	) Spas, Commercial
Dryers, and Air Filter Labeling	) Clothes Dryers, and
_____	) Air Filter Labeling

CALIFORNIA ENERGY COMMISSION

THE WARREN-ALQUIST STATE ENERGY BUILDING

IMBRECHT HEARING ROOM

1516 NINTH STREET

SACRAMENTO, CALIFORNIA

THURSDAY, AUGUST 3, 2017

9:00 A.M.

Reported By:
Peter Petty

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Stakeholders:

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Mary Anderson, Pacific Gas & Electric (PG&E)

Jeff Farlow, Pentair

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Sean Southard, Whirlpool Corp

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Public Comments: (* Via telephone and/or WebEx)

Phillip Gelhaus, Foundation for Pool and Spa Industry Education, FPSIE

*George Nesbitt, Independent HERS rater

Nathan Coelho, Master Spas, Inc.

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*Peter McKinney, StrionAir Incorporated

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I N D E X

I N D E X

P R O C E E D I N G S

AUGUST 3, 2017 9:03 a.m.

MS. DRISKELL: I'm Kristen Driskell. I'm the Manager of the Appliances Outreach and Education Office. I'll cover a few housekeeping items before we begin.

For those of you who are not familiar with this building, the closest restrooms are located outside the door to the right. There's a snack bar on the second floor if you are hungry. It's under the white awning.

And in the event of an emergency and the building is evacuated, please follow employees to the appropriate exists, probably this one. We'll convene at Roosevelt Park, which is the park across the street. If you're not in an emergency, please use the main exit that you came in through. These ones will have an alarm on them and they will go off.

Here's our agenda for today. We'll start with Staff's Replacement Pool Pump Motor proposal. Then we'll have a set of stakeholder presentations, about ten minutes for the people here. And we'll open it up for discussion and public comments.

After a short break, we'll turn to portable electric spas, stakeholder presentations and another public comment period.

We'll cover some next steps before we move on to the lunch break and then we'll have our lunch break.

For the afternoon session, we will have a commercial clothes dryers. Have a presentation from the IOUs on the proposed test procedure and then open it up for comments. And then we'll turn to air filters.

If you'd like to make a comment or ask a question during one of the public comment periods, I actually invite you to sit at the table now. That will facilitate making that comment and you can just push the button on your microphone to turn it on if like the (indiscernible) is on. Please state your name and your organization before making the comment. And if you can, please provide your business card to our court reporter who's walking around raising his hand, so that we can get your name correctly in the record.

If you're joining us by WebEx, please use the raised had feature and we will call on you after taking comments in the room. You may also type your comment or question into the chat box and we'll read it out loud to the room. If you're not seeing an audio device next to your name on WebEx, that means we don't who you are. You need to ping us and call back in using your audio pin, so

that we can call on you.

We'll go over a brief history of our pre-rulemaking proceeding for all of the topics today. They all start off the same. They started with an order instituting rulemaking in 2012. In 2013, they released an invitation to participate at workshops. In June, we had an invitation to make proposals. And then in May 2014, we requested additional information on small network equipment, commercial clothes dryers, portable electric spas and pool pump motors.

At this point the schedule is diverse for each of the appliances. For pool pump motors and portable electrics spas, we published our first draft staff report in January of 2016 and held a workshop the next month. We published our second draft staff report in June 2016 and held a workshop after that in July. At that point, the U.S. Department of Energy took over dedicated purpose pool pumps and published a final rule in January 2017, and that rule is now final.

So now we are at a point in July where we published our second revised staff analysis, our third report, on replacement pool pump motors and portable electric spas.

A shorter history for commercial clothes dryers, we had a -- the California IOUs docketed their case report,

proposing a test procedure for commercial clothes dryers in February of this year. And then in July, we published our draft staff analysis for commercial clothes dryers. So this is the first workshop on those topics.

Finally, air filters. We actually adopted testing, rate reporting and labeling requirements for air filters in May of 2015. Due to some comments from stakeholders about difficulty complying, we adopted emergency regulations to delay the compliance date to April 1, 2019, and are currently wrapping up what we call a certification rulemaking to make that delay permanent. That will be adopted at the August 9th business meeting.

In order to correct the errors, we published a staff report on July 18th proposing different ways to correct those testing procedures for air filters.

This is an overview of the entire rulemaking process at the Energy Commission. We are, where that circle just showed up, discussing the draft staff analysis in a public workshop. After this point, we will move to a standardized regulatory impact assessment for those regulations that have an economic impact of $50 million or more. Then move into the formal rulemaking period, beginning with publication of a Notice of Proposed Action. The green bubbles on this show all the opportunities for public participation. There are probably even more

opportunities than we can show here since you can always call us or contact us with questions. And we also take written comments on all the draft staff reports.

Speaking of written comments, so we are accepting oral comments at today's workshop. We also encourage written comments to our docket. Comments are due by 5:00 o'clock p.m. on September 1st. You can submit electronically by going to the links here. Please make sure you go to the right docket.

For portable electric spas and pool pump motors, the docket's 15-AAER-02. For commercial clothes dryers and air filters, it's 17-AAER-01. And we'll present this information again, so you don't have to write it down.

If you're interested in submitting confidential information, please contact staff first and we'll put you in contact with our Chief Counsel's Office. There's a confidentiality process you have to go through to submit confidential information. And you need to make sure that you contact us before you submit it. Otherwise, all comments will become part of the viewable public record.

I will now turn this over to Sean Steffensen to present our Replacement Pool Pump Motor Staff Report.

MR. STEFFENSEN: Good morning. My name is Sean Steffensen. I'm a Mechanical Engineer at the Efficiency, Education and Outreach Office. I would like to welcome

everybody today both in the room and online. Thank you for your participation. Here is the agenda for my presentation.

I will summarize the updates to the draft staff report and then my suggested topics for discussion. Pool pump motors, including motors sold with a pool pump and replacement motors use a significant amount of energy. As much as 2,500 kilowatt hours per year per pool, according to the Residential Appliance Saturation Survey. The California Energy Commission first regulated pool pumps and motors, starting in 2004. Before that time, most pool pump motors were single speed. Some pools utilized fairly inefficient motor types.

There are current standards for residential pool pump and motor combinations and replacement residential pool pump motors. The standards prohibit inefficient split phase, or capacitor start induction run electric motors. They require all pumps and motors of 1 horsepower or greater total capacity to be capable of two-speed operation.

Today, we will discuss staff's proposal to update the standards, with a focus on what has changed since we last met. As I present today, I will attempt to say replacement pool pump motors or replacement dedicated purpose pool pump motors. From time to time I may say

"replacement motors" to briefly mean replacement pool pump motors.

This shows the rulemaking process. I will note our process differs from the U.S. DOE. Each green bubble indicates an opportunity for the public participation. We are currently in the stage indicated by the blue arrow with a 45-day comment period that started when staff published its draft staff report on July 12th, 2017.

Today, we will discuss the staff proposal. We seek your comments to determine if the staff proposal is ready to enter the formal rulemaking process. If not, the staff will revise the proposal and repeat today's workshop.

Next, we will perform a standardized regulatory impact analysis, or a SRIA. The SRIA will study the impact of staff's proposed regulatory change. The full rulemaking stage will begin with a 45-day comment period and an issuing of a Notice or Proposed Action.

At the conclusion of the comment period and after we've had one more workshop, the Commission will hold a public hearing. The Chair and Commissioners will consider public comments and they will vote as to whether to adopt the proposed regulation. Some of this is somewhat different than DOE and I know some of you in the room are more familiar with DOE, so I'm taking a couple of moments to discuss what our requirements here are in California.

The Office of Administrative Law will review the adopted regulations to ensure they meet the requirements of the Administrative Procedure Act. The regulations will then be filed with the Secretary of State and at that point become effective on the effective date. I've noted various durations on this slide to show a typical durations. Those durations that are not required by law and may vary based on business needs.

Staff reviewed comments from the July 2016, staff workshop and the comments to the docket. Staff also reviewed information for the dedicated purpose pool pump effort at the U.S. Department of Energy. I appreciate the comments received as well as the spirit of collaboration during the U.S. DOE process.

The proposal has shifted, our staff proposal has shifted to focus on replacement motors as the U.S. DOE has issued a direct final rule for a dedicated purpose pool pump standards.

Staff proposed to align replacement motor testing in standards with the DOE pool pump testing and standards. Staff added freeze protection setting requirements consistent with those adapted to the dedicated purpose pool pump direct final rule.

Our goal is to continue to be to modernize the standards, take notes of current market trends and

technology advances and to extend state-wide energy savings.

I post a link here to the staff proposal and all its details. I invite you to take a look at it and to comment on it in detail. We hope to receive public comments today in this discussion and also in the upcoming weeks as part of our process.

So now I'll address certain aspects of the proposal to highlight changes and what has stayed the same. The proposed scope includes replacement pool pump motors that are 5 horsepower or less. Residential pool pump motor applications, commercial pool pump motor applications, staff also intends to cover the various pool pumps found around pools including filter pumps, pressure cleaner booster pumps and waterfall pumps. The scope will include replacement pool pump motors for in-ground, above-ground and storable pools.

Staff proposes replacement motor equipment classes to align with the U.S. DOE dedicated purpose pool pump equipment classes. The definition for each equipment class rely upon the designed and marketed definition as found in the pre-published DOE dedicated purpose pool pump test procedure direct final rule.

Staff seeks comment upon this approach to define replacement motor equipment classes in this manner. Study

of separate equipment classes allows consideration on separate test conditions and separate efficiency standards to collect differences in use and utility of these devices.

Staff proposes a motor weighted energy factor to align to the U.S. DOE pump weighted energy factor. The performance metric compares the output power to the input power as a measure of efficiency. The two figures shown on this slide shows some similarities on the metrics. In each figure, a motor must apply a torque to overcome the load. On the left, the load comes from the pump impeller as it pushes the water through the plumbing system. On the right, a dynamometer, or device used to test the motor simulates the impeller. The dynamometer imparts the load on the motor shaft in the test procedure and what we're discussing today will set what that load should be.

What torque or motor load would simulate the load from the impeller? The U.S. DOE chose System Curve C to set the test conditions for pool pumps. Curve C flows result in high flow. High flow would lead to a high motor load. And that's where I would suggest starting the discussion. I seek comments as to what the motor load would best be to replicate the load from the pump.

Staff assumes 55 percent per pump efficiency, based upon the U.S. DOE dedicated purpose pool pump technical support document, Table 3.6.2. Staff chose 55

percent as a middle value as shown in that chart. Staff seeks comments as to this assumption.

The test points are modeled after the test point from the U.S. DOE dedicated purpose pool pump test procedure. There's high-speed testing and low-speed testing, where available, with the motor capability and the test points are intended to align with the U.S. DOE test points. High-speed turndown is allowed for variable speed motors to align with the U.S. DOE.

This chart shows the replacement pool pump motor minimum motor weighted factors. The minimum performance is aligned with DOE WEF standard. Staff used a conversion of 1.4 to convert hydraulic horse power, which the U.S. DOE uses to define their pump WEF to then convert in this equation to motor WEF. Otherwise there are no other changes to the DOE equation. So that's how I'm proposing to go from, as we discussed at DOE the hydraulic horse power to the total motor horse power, just what I hope to get is an equivalent standard.

Further, staff chose 1.4, to maintain California's requirement for two or more speeds for motors 1 horsepower or more. That's the reason behind the 1.4, in addition to aligning with the DOE. Staff seeks comment upon this approach. The next slide will show the effect of this choice on where the small versus self-priming

filtering pump standards occur.

Staff performed a survey of pool pump and motor combinations in replacement pool pump motors certified to the Commission. This chart focuses on the replacement pool pump motors, certified to the Commission as of April 2017. This chart shows that there are available models that will meet the proposed standard specifically for large -- and it just shows self-priming or I'm stumbling over the words here, the self-priming large filtering pumps are shown on the right, with the first sloping curve. Then we see the line that drops vertically. And then we show what the conditions are for the small self-priming filtering pumps.

Again, I believe this shows a consistent breakdown of -- and I've also shown various motor construction, dual speed as red, single speed as blue and variable speed as green. And this approach draws the line consistent with where I believe DOE. I also seek comment upon this proposal.

Staff applied the standards, saving methodology used on previous rulemaking efforts to calculate the savings on consumer and state-wide models. Efficiency of current compliant products were held at the same level, while non-compliant products are moved to exactly meet the standard, the minimum standard, the minimum standard. Staff assumed product stock and duty cycles, operational

speed and product life times as documented by the U.S. DOE's dedicated purpose standard technical support document.

In other words, I went and looked to the most recent information in the U.S. DOE docket and updated my analysis to reflect those numbers that are the participants that the DOE agreed to. Calculation details are shown in Appendix A of the draft staff report.

The proposal is cost effective with payback periods well within the product lifetimes where standards are proposed. This shows the residential case. On the next slide I show the commercial case, since the scope is intended to encompass both motors that are intended for residential applications and commercial applications.

Staff found substantial statewide energy savings for the proposed standard. When fully implemented, the standard will save 657 gigawatt hours per year. Staff received comments that differed on how much or how often consumers would choose to replace just the motor, rather than the pump and motor combination when the motor fails. The estimates, as shown in the docket, differed between 25 percent to 60 percent of the time that a consumer would choose to replace just the motor.

The estimate here assumes 25 percent of consumers choose to replace the motor while 75 percent of consumers

choose to replace the pump and motor at the end of motor life. A higher percentage of consumers choosing to replace the motor would leave to greater savings under this proposal.

The proposed standards provide millions of dollars of savings for California businesses and consumers. At full stock turn over there will be $121 million of electrical cost savings.

I have listed some items to facilitate discussion at this workshop. Staff seeks input on a proposed replacement motor test procedure. How could the proposed test procedure be improved? Do the test conditions reflect the loads a motor would see if coupled to the pool pump moving water on the pool pump system? Does the proposed replacement motor standard provide that replacement motors are at least as good as the original motors in the pumps compliant with the U.S. DOE standard? If not, how could the standard be modified to achieve the same?

Staff is aware that many motor type are used to drive dedicated purpose pool pumps. Some replacement motors may be covered products under the existing DOE electric motor rule or the DOE small electric motor rule.

Staff seeks your comments to identify overlap between the staff proposal and the existing DOE rules. Staff notes the recent DOE test procedure for small

electric motors and electric motors request for information. And also the public meeting on dedicated pool pump motors. And we plan to participate in these activities.

Staff has released a draft staff report. We are in a comment period right now. Comments may be submitted electronically at the link above or emailed to the docket. Hard copies may also be sent to the Energy Commission at the address shown on the slide.

For those of you on the phone, this entire package has been docketed and is available in docket 15-AAER-02. Comments are due by 5:00 p.m. September 1st. Once we receive comments we will analyze the issues, compare the comment to the proposed standard, and figure out the best path forward. We look forward to your feedback and will work hard to incorporate it into our next draft of the standards.

Thank you for your participation today. My contact information is shown here.

We will next proceed into the formal presentations followed by an opportunity to receive comments from the public. I can take clarifying questions on this presentation, but substantial comments and statements should be saved for the public comments following the remaining formal presentations. Thank you.

Please state your name and organization.

MR. OSBORNE: Ken Osborne, with Regal Beloit. Just to clarify, this is targeted at replacement motors only. And we have the dedicated purpose pool pump rule coming from the Department of Energy. So I'm surmising that you're going to wait for that to impact the pool pumps. Your effort is to close all the loopholes under the replacement motor market. But are you concerned about a period from 2019 to 2021, two-and-a-half years, where the loopholes are closed for the replacement motors, yet loopholes still exist for complete pumps?

MR. STEFFENSEN: I think that's a great topic for today to discuss. And we would want to understand what you feel and the others in the audience feel would be in that case as you described it, to further discuss and describe that situation.

MR. OSBORNE: Okay. Thank you, Sean.

MR. STEFFENSEN: Any other questions? Thank you.

Next up will be Charles Kim from the California Investor Owned Utilities and just hold on just a moment while I switch the presentation over.

MR. STEUBEN: Good morning. My name is Jeff Steuben. I'm here to help facilitate the process of the comments from the investor owned utilities, so while Sean is changing the presentation I just wanted to introduce

myself.

MR. STEFFENSEN: I believe I have Chad's presentation.

MR. STEUBEN: Great. Thank you.

So Charles, are you on the line to provide comment?

MR. KIM: Can you hear me?

MR. STEUBEN: Yes, we can.

MR. STEFFENSEN: Yes, we can. Thank you.

MR. KIM: Can you hear me?

MR. STEFFENSEN: Hi. This is Sean Steffensen. We can hear you, (indiscernible) now.

MR. KIM: All right, thank you.

I'm Charles Kim of the Southern California Edison Company. I'm speaking on behalf of California's small utilities (indiscernible)

(Audio cuts in and out during speech.)

California ISOs have (indecipherable) pool motors and pool pumps for many years, recognizing (indiscernible) for the market. And (indecipherable) --

UNIDENTIFIED SPEAKER: I'm not getting it.

MR. KIM: (Indiscernible) California IOUs support this effort at (indiscernible) --

(Off mic discussion of audio issues.)

MS. DRISKELL: Charles?

MR. KIM: Yes?

MS. DRISKELL: I'm going to pause you. We're having a hard time hearing you in the room. Is it possible for you to get a line?

MR. KIM: Okay. Can Jeff then read my statement?

MR. STEUBEN: Yes I can, Charles. I can go ahead.

MS. DRISKELL: Sorry about the difficulties now.

MR. KIM: All right, thank you.

MR. STEUBEN: All right. I will start from the top on behalf of Charles here. So this is from Charles Kim on behalf of Southern California Edison, speaking on behalf of the California Investor Owned Utilities.

"The California Investor Owned Utilities have been involved with pool pumps for many years, recognizing and identifying the energy saving functionalities, incentivizing pool pumps to transform the market. And today we are focusing on variable speed pool pump and motor by rebating $200 per qualifying products.

"I'd like to take a moment to thank the pool pump industries for partnering with the California Investor Owned Utilities, for benefitting Californians over the years.

The California Energy Commission is taking a leadership role, once again, for an update. And the

California Investor Owned Utilities are supporting the CEC's efforts. I am especially thankful for adding clarity and definition on coverage of all pool pumps for 5 total horsepower."

So that is the comment here from Charles. And we'd like to pass it over to Chad to give a presentation. So we have that up on the screen. So Chad, are you available?

MR. WORTH: Yeah, can you hear me?

MR. STEUBEN: Yes we can. Go ahead.

MR. WORTH: Okay. (Indiscernible)

(Audio cuts in and out, unintelligible.)

MR. STEUBEN: Hey, Chad? Can I pause you really quick here? So the connection is a little garbled to understand you. Do we have a --

MR. WORTH: Yeah. I've tried my (indiscernible) but it's very scratchy on my end as well. I don't know how to make it better.

MR. OSBORNE: Could they try hanging up and calling in again and see if it clears up?

MS. DRISKELL: It sounds like he did.

Chad, we'll try to have you proceed. We might not be able to get it down on the transcript. So we'll probably want you to submit your comments also in writing.

MR. WORTH: I'm just calling in. It sounds like

people are having similar problems as well. Okay. I'll try to do this quickly and speak as little as possible, next slide.

The IOUs have a fairly long history of engagement and involvement with pool pump energy efficiency starting in 2001. We were very involved in the last Title 20 rulemaking. This rulemaking began in 2012. We participated here, also essentially in the DOE working group, which was just finalized in 2017. Next slide.

The current Title 20 motor standards, as most people here are probably aware, is that there's a motor efficiency standard saying pool pump motors manufactured on or after January 1st, 2006, may not be split phase or capacitor induction run. There's also a two multi or variable speed capacity requirement that applies to residential pool pump motors over 1 horsepower, such and they must have a control to operate as well. Next slide.

Real quick, are people able to hear me better? It's gotten a lot quieter on the line.

MS. DRISKELL: Yes.

MR. WORTH: Okay. Great. Again, with regards to this rulemaking we've been very engaged in this from the start. We originally submitted our case proposal in July of 2013. We participated in a CEC workshop in that following January of 2014. CEC then issued a data request

in March of 2014. We responded to that data request. Shortly after, we started engaging with the APSP-15 Committee to work on a number of the test procedure issues. And on September 30 of 2014, we documented a revised data request response.

On October 9th, the IOUs hosted an industry round table with the Energy Commission at PG&E's office in San Francisco. And then since that there's been a staff workshop in February of 2016 and in July of 2016, in which we participated and responded to both of those. Next slide.

Broadly, the IOUs support CEC's staff proposal, which we believe the proposed standards are cost effective and achievable and will lead to a significant amount of savings. We'd also like to commend the CEC on their work on the staff report. It took a lot of work and a lot of good thought and we're very supportive of the staff report generally.

But when you kind of boil it down, the main things that the staff report does is it aligns replacement motor standards with a new metric, the motor weighted energy factor, and less aligned of the DOE rule. We think this is very significant and support that. It moves the standards from prescriptive to performance. It helps close loopholes by ensuring that all pool pump motors are

covered. And it also provides various clarification and simplification to the test procedure and reporting requirements. Next slide.

As pertains to the test procedure, as was mentioned the original test procedure, the IEEE 114, is not ideal for testing motors at multiple speeds. The IOU team worked with the APSP-15 Committee and identified the CSA C747-09 as more appropriate. What the staff report does is aim to simulate the hydraulic characteristics from the DOE pump test procedure to ensure that comparable replacement motors are available and meet similar efficiency requirements. And with the test procedure, we also support the updated reporting requirements for freeze protection, standby power and power factor. We think this will provide useful information to consumers and utilities. Next slide.

Again, the big thing that also the staff report does is expand the coverage to all pool pump motors. Right now Title 20 only applies to residential filtration applications. This has created significant challenges as well as confusion in the marketplace. This proposal will extend the motor efficiency standards to align with DOE standards and cover all motors under 5 total horsepower and align with the DOE product classes.

We believe this will greatly improve compliance

and expand savings in the new applications. Next slide.

And as mentioned before, the shift from prescriptive to performance standards will allow all different motor types to compete. And by aligning with the motor weighted energy factor we think this will really encourage efficient motors throughout. Next slide.

We support the January 1st, 2019, effective date as noted in the analysis. Each year of delay is costing California pool owners roughly $16.9 million in electricity costs. We support the alignment of the new pump motor standards to align with the DOE rule when it takes effect in 2021. Next slide.

And so some of the suggestions for improvement, the staff report I believe it's the third, has largely improved and there's great progress made on many of these issues. We'll be making a couple of comments in writing in a little more detail with regards to the motor capacity thresholds to align with the hydraulic horsepower values as well as some definition recommendations. And we look forward to submitting these comments in writing. Thank you very much.

MR. STEFFENSEN: Thank you, Chad.

So next up will be the APSP. I'd like to invite the APSP. If you could, if you're more comfortable there or coming up here.

MR. SIDDIQUI: Whichever you prefer.

MR. STEFFENSEN: I don't care, but it's like the acoustics are --

MS. DRISKELL: No. Just make sure you speak directly into the mic, so that people on the Web can hear you.

MR. SIDDIQUI: Sure. My name is Shajee Siddiqui. I'm with Zodiac Pool Systems, but I'm making this presentation on behalf of the Association of Pool and Spa Professionals. Can everyone hear me okay?

The Association of Pool and Spa Professionals, also known as the APSP and its pool pump and motor manufacturer members are supportive of the Energy Commission's initiative to further advance the efficiency standards for pool pump motors.

For us, this is yet another opportunity to demonstrate our ability to cooperate with the various constituents and most has been most recently demonstrated in our cooperation with the Department of Energy in getting their dedicated full purpose pool pump working group and final rule established. Next slide please.

What follows are just come comments we that have with respect to the most recent proposal for the motor rule, put out by the CEC. The next few slides address some of the definitions that have been identified and just

questions.

The current replacement motor definitions, as proposed by the Energy Commission, rely upon the designated and marketed definition what will identify replacement pool pump motors that can be shown to be intended for use with a pool pump by the markings on the motor packaging or through descriptions in catalogs or other publicly available documents.

The APSP manufacturers have a concern that this definition or this regulation could possibly be circumvented by a motor manufacturer designating a replacement as something other than a pool pump motor. So we'd like the Commission to look at that. Next slide please.

Thank you. Also, the CEC equation for replacement pool pump motors assumes that the pump is 55 percent efficient. And our concern is if a pump is more efficient than the replacement motors required to meet the motor WEF could potentially have to be more efficient than the original motors.

So the APSP recommends that this be looked or possibly changed. Otherwise pump manufacturers may not be able to sell replacement motors for the pumps that do comply with the rules. So this is just since we don't have any data we'd like to look at this a little bit more

carefully. Next slide please.

With respect identical replacements, regarding the replacement motors, the pump manufacturers should be allowed to offer the identical replacement motor for the pump, which complies with the upcoming DPP rule, or DPPP rule, the DOE rule, without additional qualification of the motor regardless of any requirements established as a result of this rulemaking. That's just to make sure that if we've got a pump that complies that when the replacement motor is sold separately, that won't be found as non-compliant by California. Next slide?

With respect to freeze protection, regarding the freeze protection, the APSP requests that the CEC adopt and align with the federal DOE guidelines, which include that if the pump is shipped with freeze protection disabled, then the prescriptive requirements should not apply to that pump. Next slide.

With respect to the timing of the rules, the DOE rule versus the CEC, the federally Dedicated Purpose Pool Pump Regulations, DPPP pardon me, go into effect July 2021. APSP recommends that the CEC align the implementation of its revised efficiency standards for pool pump motors with the federal rules, so that the industry can prepare for both concurrently. Next slide, please.

APSP also recommends that that the DOE determines

to move forward with the federal regulation on pool pump motors, which sounds like it is, we would respectfully ask the CEC to postpone the pump motor regulations altogether for the DOE rule, which we believe would preempt any CEC pool pump motor regulation.

So basically, it's the industry's position that any DOE pump motor rule be implemented as close to the DPPP rule, the 2021 date. So just basically repeating what I spoke of in the earlier slide. Next slide, please. Thank you.

The pump and motor manufacturers have had a long history of working with the regulators and the energy advocates on higher efficiency standards. Our work with both the CEC and the DOE represents our commitment to continuing to do so. We are pleased to see that the CEC is working to address loopholes that have been created in regards to the pool pump motors when the DOE rule was established. And we hope it will encourage the federal government to follow suit. Next slide.

And in closing, we look forward to working with all parties to deliver an effective set of efficiency standards for pool pump motors and align such regulations to ensure consumers realize the maximum benefits. To that end, APSP respectfully requests that the CEC consider out comments as well as those provided by our member companies

as it develops its final rulemaking.

And with that I thank you on behalf of APSP. And I'll step into my role as a representative of Zodiac Pool Systems and also say that we support everything that I just spoke on behalf of the APSP as well. Thank you.

MR. STEFFENSEN: Thank you, Shajee.

Next up, Jeff Farlow with Pentair.

MR. FARLOW: Good morning. This is Jeff Farlow, with Pentair. And I wanted to give thanks for the opportunity to participate in these hearings. California's Commission has always been very transparent and collaborative. And so we want to thank you for this opportunity, okay? Next slide.

This is just to let you know visually that we absolutely support getting rid of pool pump motors and the energy hogs. That many of them still exist in the market, so we do support eliminating these energy hogs from the market. Next slide.

So Pentair, we do have a long history of working with the California Energy Commission, the utilities in California, to provide more efficient products that give us an energy efficient option in the market. One of our focuses is to develop energy efficient products for the pool industry.

If we look at the 242 pool pumps and motors that

are currently listed in the CEC database, 85 of those or about 35 percent are Pentair models, so we absolutely do focus on that. We also have made a significant investment in training in the State of California. And this is to train our industry on the California energy efficiency regulations, on how to comply with them, what they mean, how to interpret them. We've also done a lot of training to the trade on how to properly operate the equipment, so that energy savings are achieved. So we absolutely do support this.

Another thing just to demonstrate our focus on energy efficiency, we are an ENERGY STAR Partner of the Year Award recipient for the last four years since ENERGY STAR has had a certification for pool pumps. So again, just to demonstrate our commitment to that. Next slide.

So we'll look at some specifics for the proposed standards. We absolutely think it's correct to try to harmonize with the DOE rules. And it seems like on the surface the motor weighted energy factor is a good metric to do that. It seems to be superior to using a typical motor efficiency metric.

We think that the motor weighted energy factor helps take into account the savings that are obtained from the pump affinity law. Whereas the motor efficiency metric would not do that as well, from our perspective, so we do

support the motor weighted energy factor. At least that at a high level.

Before we could really commit a full throated commitment to this, we would like the opportunity to do some actual testing and see more specific data, so that we don't have any unintended consequences from this. So a little bit more time with that would be helpful, you know, we are assuming a 55 percent wet end hydraulic efficiency. We're not sure how that will play out when we put it with the motors, so more time would be needed to evaluate.

We do have the same concern that there would be a case where, if we had a pump that was compliant, a finished pump that was compliant for the DOE regulations. And then we wanted to offer that replacement motor for sale that there's a chance that that replacement motor would not be in compliance although when used on a compliant pump, it works fine. So I think that would be an unintended consequence that we should really be aware of. I don't think anybody would really want a valid replacement motor to not be able to be used on its original pump head.

So just to make sure that there's provisions that would allow that would be a recommendation. Next slide.

So as we went through the Department of Energy Dedicated Purpose Pool Pump Regulations, we were very vocal on the need to close this motor loophole. We just don't

think that the savings would be achieved if this loophole exists. DOE responded positively with our request to close this loophole.

In fact, we have our initial meeting scheduled actually one week from today in Washington D.C. to address this very issue. Our intent and desire is to have the motor loophole issue resolved by the July 2021 implementation date, for the dedicated purpose pool pumps.

So it would be our recommendation to try to hold off on the CEC regulation, at least track along with the DOE regulation so that the DOE regulations would be the national standard. And there's also concern about having just a California only regulation. And it has to do with the lack of inspector presence during the retrofit or replacement activity. That's typically not -- a permit is not issued.

I think there's good opportunity for a new pool construction where permits are issued and there's plan reviews. But in the replacement market, which is very prevalent in California, there's really no enforcement or regulation on that. And we're concerned that a California only rule would just cause a lot of non-compliant product to be shipped and purchased online, or shipped in across state lines, and circumvent this rule. Whereas if we waited for a national standard that could be avoided. Next

slide.

There's also an issue that we've identified. And this goes back to the dedicated purpose pool pump regulation with the Department of Energy. And we've made them aware of this and we are going to addressing this, but I'm bringing it up now to try to prevent a flaw or unintended consequence to be perpetuated into a California regulation where then we have to deal with it at this level also.

And it has to do with 5 horsepower pumps, which would be regulated under this standard. And the Department of Energy, to give a little background, has chosen Curve C to determine what the maximum horsepower is of a pump. And what I've presented here is a slide to show a 3 horsepower pump applied across Curve C. Curve C would be the yellow system performance line. And then the 3 horsepower pump would be the red line. And then on top of that, I have a 5 horsepower pump, which is represented by the blue performance curve, the solid blue line.

And we see that both of those pumps cross Curve C at the exact same point. So they would be rated with the exact same horsepower, based on the flows and pressures in that intersection point. But if we look at where the 5 horsepower is intended to operate, we see that Curve C is not its optimum point. In the dotted lines you'll see

where I've plotted the efficiency for those two pumps.

The 3 horsepower pump efficiency peaks around 120 gallons per minute where the 5 horsepower pump's efficiency peaks out closer to 180 or 200 gallons a minute. So the 5 horsepower is really not intended to operate on the Curve C system.

While we have not addressed the solution to this yet, we are working on it. So I wanted to just bring it to your attention. Some thoughts are we need an additional system curve. Right now California only recognizes A, B and C. Curve C was recommended to California. Back in about 2008, the APSP had a subcommittee that helped determine what Curve C was. At the time we actually identified a Curve D, but we chose not to even include that at the time. But I would say that even a Curve E may be better represented by the system that these 5 horsepower pumps are intended to operate on. So something to consider as these standards unfold. Next slide.

And so that's it. I once again want to thank on behalf of Pentair the opportunity to participate and the CEC transparency and openness to comments in this process.

MR. STEFFENSEN: Thank you, Jeff.

So the ASAP, Appliance Standards Awareness Project, will be joining us online.

MS. MAUER: Hi, Can you hear me?

MR. STEFFENSEN: Yes we can.

MS. MAUER: Okay. So (indiscernible) online, I think we're all hearing really well background noise when anyone in the room is speaking. It seems to go away when Chad was speaking and then came back. But hopefully you can hear me okay.

So this is Joanna Mauer with the Appliance Standards Awareness Project. ASAP organizes and leads a coalition of efficiency advocates to advance the appliance standards at both the national and state level. We have a steering committee that includes representatives of efficiency and environmental groups, consumer groups, utilities and state government.

We appreciate the opportunity to participate in today's meeting. And we're pleased that the Commission is advancing standards for replacement pool pumps motors. And we're a member of the ASRAC working group that negotiated the new national standards for pool pumps that were finalized by DOE earlier this year.

However the DOE standards do not address replacement motors. And there's concern that absent standards for replacement motors consumers can chose to buy a replacement single speed motor instead of buying a new variable speed pump, which will impact both pool pump manufacturers and energy savings. And there's therefore a

broad support for standards for replacement pool pump motors among the stakeholders involved in the DOE-led negotiations for pool pumps.

Standards for replacement pool pump motors offer large potential energy and economic savings. CEC staff estimates that the proposed standards after staff turnover would face 157 gigawatt hours per year, which translates to $122 million in bill savings for California consumers.

These standards would also help protect the very large savings from the DOE standards for pool pumps. DOE estimate that on a national level, the pool pump standards will save 3.8 quads of energy over 30 years of sales.

To put this in perspective, these savings are equivalent to about 4 percent of total U.S. annual energy use. Complementary standards for replacement motors will help ensure that these very large savings from the DOE pool pump standards are actually achieved.

We believe that aligning California standards for replacement motors with the DOE standards for pool pumps, as extent possible as is proposed in the staff report, makes good sense. In particular, it makes good sense that the energy factor score of replacement motors be roughly equivalent to that of motors in new pool pumps.

Finally, new CEC standards for replacement pool pump motors could serve as a model for other states and for

potential future national standards, which would increase the impact of the California standards. Thank you.

MR. STEFFENSEN: Thank you.

Up next, we'll have Scott Petty from Hayward Pool Products.

MR. PETTY: Good morning, everyone. My name is Scott Petty from Hayward. I think on the last one, everybody heard a lot of this, so I'll try not to repeat. Next slide, please?

Hayward, as well as many of the other representatives here, we do support where the CEC is taking this proposal for replacement motors. And particularly, really involved the different approach, particularly innovative approach of (indecipherable) as Jeff previously mentioned, taking into account the weighted energy and then the benefits of running pumps at different speeds really I think helps align and close the gap versus just looking at motor efficiency as was previously presented.

So I think this is a really great opportunity to align that. And so like some of my counterparts, I just have some general comments for areas that we may want to evaluate. But are by no means not something that would be deal breakers by any means. Next slide.

Again, as was noted before I think a challenge we could face is that definition, being based off designs and

marketed. We recognize that there aren't right now, easily defined visible characteristics that would separate pool pump motors. And so therefore an alternative is designed and marketed. So while I think this could work, it could lead to some unintended consequences as (indiscernible). So I don't know of an alternative solution, but if the industry and with the motor manufacturers -- if there are any opportunities for any physical characteristics or other means of separation I think that would help, because this could lead to unintended consequences by relying on marking. So I would just encourage the group to really brainstorm if there are other options to better define these characteristics. Next slide.

Again, the same type thing with that is potential loopholes or unintended consequences. I mean, for instance, we know Hayward uses the same motor on a booster pump as it does on a single speed self-priming pump. And so how does that work when it's a complete system, a pump. There are different characteristics as defined by the DOE, but on the motor only. Could that again lead to unintended consequences and loopholes, so better definitions could help limit that. And so I just again encourage the group to look at those to see if you can better type those up. Next slide.

The same thing as was mentioned before by

particularly pool pumping manufacturers, to allow from the pump manufacturer to offer the component that's used in a regulated pump to not have to do anything additional for that motor only. Particularly, kind of jumping to the bottom one thing that I don't know was really discussed directly in terms of the DOE or here at the CEC, is there's items that are sold. But then there's also no charge warranty replacements, so if a product fails a motor is often the component of a pump that may need replacement. How is that handled? We wanted pump manufacturers to be able to offer the same component that they had when they bought the complete pump. So a proposal would be could we just exclude no charge warranty replacements to make sure that the consumer doesn't have to purchase, or had to utilize something that's different from what they already had before.

So getting us to at the end of the day to the goal, which I think we all have, is that the motor that is the component that is the complete pump should not have any additional requirements beyond that of the pump as a whole. Next slide.

Again, this was talked about before, the assumption of 55 percent. Hydraulic efficiencies can vary I'll say significantly, but we've seen numbers higher than 55 percent. So we would encourage, perhaps as

manufacturers share some data and maybe that number needs to shift. Because if it's too low the consequence could be that the replacement motor has to work harder, has to be more efficient, to compensate for the pumps having in reality a higher efficiency.

So the good news is if I rely on our engineers to do the math -- it's been a while since I've had to look at those type of equations, but I think the way the pump efficiency factors in it's not as significant. It doesn't appear that it's going to make as significant a change on the overall motor WEF. And by our math if you change the efficiency by say you go from 55 to something like 70 percent. That's a 30, 35 percent improvement. The math, I believe would show that's only about a 10 percent difference in motor WEF. And the separation between motor WEF, between single speed and variable speed should be much larger than that.

So it's something we definitely should look at, but hopefully it's not going to make a radical difference in the overall goal of this proposal. Next slide.

Again, I think this was mentioned before in the APSP, but with respect to freeze protection we request the CEC align with the DOE, which includes the statement that if the pump is shipped with freeze protection disabled, then those requirements are not applicable. And again,

that directly aligns with what is in the DOE regulation. Next slide.

So again, we appreciate the opportunity to be here. We're very encouraged to address this issue and close some of the loopholes that have existed for a period of time going to a performance-based standard that aligns with the DOE. We're very encouraged with the direction of this. We have some things that we need to, I'll say button up and address, but overall feel very confident we can get to something that's beneficial to consumers, manufacturers and the entire pool industry. Thank you.

MR. STEFFENSEN: Thank you.

Next up, I'd like to offer Don Lanser from Nidec Motors the opportunity to speak.

Don, are you there? The connection is somewhat unintelligible. Please go ahead if you're there, Don.

(Audio issues being addressed.)

MR. STEFFENSEN: I guess Don, please hold your comments and we'll come back to you. I'll guess I'll open up to the room for those in the audience for comment and we'll come back to you, Don.

Would you please state your name and organization?

MR. OSBORNE: Ken Osborne, Regal Beloit. I know I have limited time, so I'd just like to add a couple of

comments and two or three questions to be on the record.

First, I already asked about the CEC coverage of motors only in the issue of loopholes remaining for full complete pumps. So I wanted to state for the record Regal Beloit and other manufacturers have been supportive of the industry and work of the DOE to create a motor regulation aligned with the DPPP, Dedicated Purpose Pool Pump Regulation. Even though there might be some commercial advantage for selling more motors in the replacement market the motor manufacturers want to do the right thing, not move the industry backwards, but want to advance efficiency for the good of everyone in the channel.

In the same light we want you to consider for this loophole, potentially for two-and-a-half years, just a suggestion that the CEC motor standard could apply to all pool pump motors, and not just replacement pool pump motors. And that would enable the industry to then get aligned, hopefully with DOE regulations and close that loophole in 2019 instead of waiting until 2021.

Another comment for the record, there's been several comments here about 55 percent assumption on water efficiency. Regal Beloit agrees with that and suggests that the CEC consider a higher water efficiency that would broaden the range of compliant motors, but sill motors that would be well within the EL-6 range, for example, in

standard pool pump motors.

Then a few questions, Sean, you mentioned in your presentation that the horsepower uses an assumption of 1.4, which would then -- on the horsepower, hydraulic-to-motor horsepower. That ends up to be 0.995 and consistent with the history of Title 20 and 1 total horsepower and greater. But I just want to have the CEC and industry discuss that further, because my understanding is the 0.711 hydraulic could equate to motor horsepowers above 1 total horsepower, maybe 1.1 or 1.2. I just want to make sure we have the best alignment with the DOE standards as possible.

Another question is we just want clarity from the CEC on how you propose to distinguish between self-priming and non-self-priming motors? There are different standards in your proposal for those two categories.

And then lastly, we are looking for comments or direction from the CEC on how you view alignment with the DOE effort. And preemption if the DOE is to be successful and we hope to be successful in creating a federal standard on pool pump motors. Thanks for the time.

MR. GOLLAPUDI: Chandra Gollapudi, Regal Beloit Corporation. I just want to add one point to what Ken just said about the definition. I think DOE has a different requirement for definitions and I think we all said that we'd like to see more alignment.

One thing to consider is that the most important category of where the savings are, are self-priming, larger standard size self-priming and this potential to look at the physical features such as the flange or the shaft. And also potentially tie it to a standard like the UL-1081 that exists for pool pumps today. If DOE and CEC could request UL to create a standard for the motors, that is an option that you could more well define a pool pump, a dedicated purpose pool pump motor.

MR. STEFFENSEN: So let us hear -- thank you for your questions, I will get back to you.

MR. GOLLAPUDI: Thank you.

MR. STEFFENSEN: I just want to provide Don an opportunity, then we'll come to your feedback.

(Audio feedback and issues.)

MR. STEFFENSEN: Don, we're trying to -- please speak if you believe we can hear you. Don, we're not hearing anything now. Please, if you're there? Okay. Don, we're not hearing anything. Please use the chat box to provide the questions or comments that I'll address.

(No audible response.)

So I think at this point I'd like to maybe take a couple minutes myself to provide some comments and some responses to some of the questions out there where really my goal here is to further the conversation. So that way

the comments I hope to receive in the future, by September 1st, we'll be that much further along in the discussion.

That was a good comment regarding the precision of the 1.4 versus what should it be. I think probably looking back to my notes there probably was a rounding for simplicity, but that does seem to put it one way or the other of that very important 1.4 start. So I will go back and review what it would mean to round it perhaps another way. I think perhaps it may need to go to another decimal point too. (indiscernible) with a .995 versus 1 point.

UNIDENTIFIED SPEAKER: (Indiscernible)

MR. STEFFENSEN: So I would like to comments to reflect what the importance is, how close do we need to be? And division's always very tricky as to determining exactly how you get the numbers to (indiscernible) -- Your questions about the 1.1, 1.2 and also I think the comments I've heard from around the room about the hydraulic efficiency and what that may be in the calculation of the WEF.

I had presented a slide earlier that showed what the WEF would be assuming 55 percent. And in the comments that I received from a number of stakeholders, I put together using my calculations in a sense a flip book here that'll show.

And this is a what if and just very briefly the

calculation of WEF, the way I've formulated it and it's shown in the draft staff report, pump efficiency shows up in the numerator, along with the motor output power. They're multiplied together and they're divided by the input power.

And so that number in the numerator is constant and if we assume various pump efficiencies -- I put in all various values we could assume. Zero percent isn't a very good, but just to watch as we flip through how the values change, 10 percent, 20 percent. And we begin to see a separation of the product types, the motor efficiencies.

This is built upon the data that's in the database. It shows that at 30 percent, we begin to see more separation. We begin to see the variable speed, because of what I believe is the most influential part of the WEF system that DOE proposed, which I'm trying to mimic, that the turndown begins to really show its full effect. And we begin to see the separation where variable speed is pulled up high. We get to 40 percent, 50 percent.

Again now it's not being as extreme, like there's some sort of ratio, but if we continue to go this is what's proposed, 55 percent. We will continue to see a separation of the line that's drawn as to what's compliant, what's not compliant. What's above the black line that's compliant, what's below the black line would not be compliant.

We continue on 60 percent, 70 percent. And just to note that the pumps are certified to the database using the motor efficiency data that was provided. That's how I've tried to calculate what would be in a sense the input power and the output power through that. What stays as the motor efficiency and the motor total capacity. That's how I derived the inputs to the WEF calculation.

I don't throw in a lot of terms here. I know I will speak to everyone of you in person in more detail so you can understand my thoughts. But as we scroll through it's 70 percent, 80 percent, 90 percent and of course 100 percent is the maximum value than we could really accept. You can't get much better than 100 percent.

We're still seeing a separation of what's compliant and noncompliant. So I believe what we're seeing -- what I see is that the WEF scoring, the ability of the turndown of the variable speed motors really provides that defining characteristic of what would be compliant or noncompliant for this proposal.

I just wanted to share this with you. Again, I'm not saying -- I'd hate to say this doesn't matter. I think it does matter a lot, but the WEF scoring is very influential as far as a turn down goes. I do want to get your comments as to -- I chose the middle value. I try not to be arbitrary. I looked at the table. There's a matrix

of six numbers, tried to figure out what would be a high cost. I really tried to keep in simple, if I can. If not, I am open to comments as to how to add an additional value detail to further make that standard much more precise. I mean we really want to include those that are compliant and exclude those that will not be compliant.

And just one last comment, while we're here, I mean I am hearing comments as to well what if the motor is compliant with DOE and not compliant under this system? And I would wonder if some of those comments are aimed at this vertical line. And I would look for comments as to where that should be drawn. That's very much a factor of the 1.4 in that denominator of those WEF scores.

I'll try to lead you towards where I think adjustments could be made with rationales provided. That's what I'm looking for and I want to speak with you. Anyone who wants to talk with me, please call me up, email me. I want to respond to your concerns.

Questions regarding definitions, I've heard comments that the design and marketed perhaps could be improved upon. I have looked for those physical characteristics. I look for comments as to what physical characteristics -- I would prefer physical characteristics.

The rationale behind design and marketed though is that consumers, those that I believe would purchase the

vast majority of these, are going to go and try to figure out what motor is going to work with what pump. And they're going to want to have that assurance beforehand that this motor that they're buying will work with this given pump. And there'll have to be some sort of communication at some point, public communication that we can all see, of a motor and what pumps that motor would be appropriate for. I would look for comments as to that rationale and what additional information can be provided to further that discussion and how we could improve these definitions.

But that was my thought behind it, in order to find the replacement motor there has to be some sort of communication and assurance to the consumer that they're choosing the right motor. Otherwise they wouldn't choose that motor. And I realize that probably some motors could be chosen by a very crafty consumer without regard to some sort of published data. So that's my comment upon that.

I do look to how we could improve it, as well as if there are dual use motors, like I've heard that comment, whether they're self-priming, non-self-priming or where maybe perhaps a motor could be used as a booster pump or a self-priming pump. I think we saw that in the DOE proceeding, the CASE team took a motor from a self-priming pump and put it on a pressure booster pump to show a

savings(indiscernible) potential.

In those instances if a manufacturer says it's good for both, I mean if my interpretation of other regulations we have, the manufacturer should be certifying for both those product categories and meeting both those standards. And I look for comments as to the effect of that.

So I've talked for a while. And perhaps I would encourage -- I mean at DOE we had a very much of a back and forth to understand responses. I mean I would open it up to anyone who would want to make further comment, either based upon what I've said or anything else that comes to mind or anyone who hasn't spoken yet.

MR. GOLLAPUDI: Sean?

MR. STEFFENSEN: Could you state your name.

MR. COLLAPUDI: This is Chandra Gollapudi, of the Regal Beloit Corporation. I think you mentioned that you took the mid-value of the efficiency. I think the goal is kind of create the separation between EL-6, variable speed and some kind of variable speed or modulation versus everything else at the same time allowing the OEM's maximum flexibility with the application of motors. So instead of erring on the mid side maybe it's more appropriate to go higher on the higher side, as long as you know there's gap there in the technology. So I would say erring on the

higher side, on the pump efficiency, is beneficial for the industry.

MR. STEFFENSEN: Great. Thank you for the comment. Those are the type of comments we were looking for. What is --

MR. GOLLAPUDI: I have one more comment or clarification question. I think CEC has taken the approach of replacement motors regulation. Whereas we know that DOE is taking the approach potentially -- we'll find out next week -- but it's more than likely that they are taking the approach of pool pump motor approach. In which case, would the CEC will be preempted by a DOE motor rule, if there is one?

MR. STEFFENSEN: I would not comment on preemption (indecipherable). That's not my specialty.

MS. DRISKELL: I can comment, Sean, if you like although I have a lawyer somewhere in the room who will correct me if I'm wrong. So if DOE does do a rule and that rule takes it back, then we would preempted at that point. So there wouldn't be two rules in effect at the same time. You only get one.

MR. GOLLAPUDI: Got it. Thank you.

MR. STEFFENSEN: I'm trying to respond, but Ken you asked several questions. It was the last question the issue of when standards would apply where if they were a

state standard or a federal standard. Again we would want to understand what you think would happen in your comments, under various scenarios. So that's something that we want to understand. And I think the industry will have an insight into that.

MR. OSBORNE: Ken Osborne, Regal Beloit. Yeah, I think in follow up we'll have some comments there. I haven't fully vetted that, but I just noticed that the Title 20 current pump regulations will remain in place. And I think there's potential to remaining in the service market for noncompliant pumps to be installed. And our goal is to eliminate the noncompliance to Title 20. And I think there's a gap there that would need to be addressed.

MR. STEFFENSEN: Thank you.

I would open it up to anyone in the room that would like to make comments (indiscernible) who've already made comments. Please come up the microphone, introduce yourself, and state your organization.

MR. GELHAUS: I'm Phil Gilhaus and I represent the Foundation for Pool and Spa Industry Education in Sacramento. And I see two situations here. The primary filter pump, as it's assembled is one issue. And then you've got the replacement motor issue is what today's agenda is.

And I'm kind of wondering about there's a

component missing in the replacement motor side is the impeller that carries the load on the motor, correct? That would influence the replacement motor and the total horsepower factor. To me, I think that the motor pump manufacturers could possibly make a subassembly where the motor and impeller were coupled and sold as a unit that would couple up to the volute or wed into the pump.

Conversely, for the motor manufacturer, maybe they want to include an impeller that marries up to the total horsepower rating and the load that that pump is put under. I don't think that any of that's being considered in this current language. And I think it's a very important factor, especially if the motor is just being purchased as a replacement and the impeller isn't being dealt with at the time of the replacement motor being addressed. This is primarily on a single speed pump, being replaced on a primary filter pump situation. I think there's an issue there that should be reviewed by the APSP Committee in dealing with that.

The other thing is that I think there's going to be a huge educational situation occurring with the new DOE ruling and how they want to go with the weighted horsepower factor. We've been teaching total horsepower at FPSIE since back in the inception of -- well at least since 2012. And now we're going to ask the industry to start looking at

a new DOE standard with a weighted horsepower factor, which is going to totally change the educational requirement and knowledge within the field. And it's going to create confusion on confusion, in my opinion and with our experience.

We've trained by way in California, FPSIE, we have certified over 1,900 what we call certified installers, that don't only take the horsepower, but the total system head in dynamic measurements is part of what we train. And we do that in conjunction with Hayward, Pentair, Zodiac, we work directly with those people.

And I think those are a couple of concerns coming from an educational point and interacting with the people who are actually doing the work in the field. That there are going to be some potential issues coming up that should be considered and there should be an education component considered somehow, moving forward to 2021 at the latest or 2019 depending on where this falls.

That's my comments for the record. Thank you.

MR. STEFFENSEN: Thank you. Could I just follow up with one question? This is Sean Steffensen of the Energy Commission. Is it a common product where a motor and impeller are sold together as one (indiscernible) model, is that just part --

MR. GELHAUS: Typically, I don't know that the

installers -- on the back of every impeller is an embossed part number. And that part number corresponds to the old way of determining the vein depth and diameter that creates the volume that creates the load on the motor, there's a designator on there. I don't know if you quizzed the industry -- and by the way I've been doing this since I was seven years old -- so matching up that impeller number to correspond to the GPM flow rate, I don't think if you quizzed the industry that many of the service trade are educated on that factor, which correlates to the replacement motor load.

MR. STEFFENSEN: Great. Thank you.

MR. GELHAUS: Does that answer your question, I hope, somewhat?

MR. STEFFENSEN: Yeah, I guess what I was fishing for is this another equipment class or do we --

MR. GELHAUS: Well, moving forward, I think that the --

MR. STEFFENSEN: -- (indiscernible) something that I would go to a pool supply store and see a motor and impeller together in a box?

MR. GELHAUS: Yes. And, or there's another way to do it. The OEM manufacturers could make a subassembly where the bracket, the seal, and the impeller are coupled to the motor. And then the service guy doesn't have to

know any of these components and it could be coupled up to the volute side of the pump. And no plumbing has to be changed or anything under that kind of a situation.

On a variable speed situation, that's a total different motor impeller altogether that I'll let Mr. Farlow have his moment, but that would be a coupled impeller with the variable speed would couple up into that volute of that originally installed pump. The volute has to match up right, though. There is a few little things there.

But anyway, I don't want to get too technical. I just think that the impeller and the motor and load is an important factor that needs to be considered, is the bottom line what I'm trying to say. Okay?

MR. STEFFENSEN: All right. Thank you.

Jeff?

MR. FARLOW: This is Jeff Farlow from Pentair. To Phil's comment, I want to point out that we do offer a pool pump motor with seal plate and impeller already installed. The term that we use is power end. So those are currently offered. I don't have data on sell volumes, relative to the pump sales, or just motor sales. We can get that for you. But that configuration is readily available to order.

But just to clarify, it would not be totally

interchangeable. Somebody could not buy a Pentair power end and put in on a STA-RITE pump, for example. It is specific to a hydraulic package.

MR. STEFFENSEN: Okay. Great. Thank you.

Scott?

MR. PETTY: This is Scott from Hayward. I think just to build on what Jeff said, the energy term power end, those are offered. And so I think Phil raised a good point, that could be another loophole depending on the definition. DOE has defined a pool pump, based off of the strainer basket, so that is a complete pump.

Depending how we define motor is maybe literally just the motor itself. And if it is, then power end could potentially fall outside of either one of those and be excluded and be another way to work around. So I think it's a good point he brings up that we may want to either include it in the definition or somehow take it into account.

MR. STEFFENSEN: Yeah, thank you. This is Sean Steffensen. And I would like to take a look at some of those and get comments that would identify as what those items are and their characteristics, would be helpful I think.

So I'd like to again invite anyone in the room that would like to make a comment. We can go on to the

phone lines.

MR. NESBITT: Yes. This is George Nesbitt. Can you hear me?

MR. STEFFENSEN: Yes, we can. Please go ahead.

MR. NESBITT: I'm a HERS Rater for those of you that don't live in the building world with home energy labor. So a couple of things --

(Audio difficulties.)

MR. STEFFENSEN: Sorry for the technical difficulties. Please go ahead.

MR. NESBITT: I --

MR. STEFFENSEN: We can hear you.

MR. NESBITT: (Indiscernible)

MR. STEFFENSEN: Sorry, George. We're having technical -- George, I think we'll come back to you. Is there someone else online? Did Don Lanser want to make a comment? We had trouble earlier.

(No audible response.)

MR. STEFFENSEN: Okay. Please try indicate your request to make any comments by raising your hand online. Otherwise, use the chat box and we'll go through those.

Okay. I think at this point we don't see any comments online. With all the technical difficulties at this point seeing no more comments in the room, we will take a ten-minute break. We will be back at 10:50 to begin

the Staff's Portable Electric Spa Presentation. Thank you.

(Off the record at 10:37 a.m.)

(On the record at 10:52 a.m.)

MS. LOPEZ: Good morning everyone. My name is Jessica Lopez. I'm an Energy Analyst here in the Appliances and Outreach Education Office at the Energy Commission. I want to welcome everybody here and those who have tuned in to our third staff report workshop on portable electric spas. Today's workshop will cover recent updates to our proposal that were detailed in the second revised staff that was published on July 12th.

Here is today's agenda. First, I will discuss the purpose of this workshop, our updates since the last staff proposal, our proposal in which I'll touch on the scope, the definitions, the test method, the standard and the label requirement; our analysis, which includes technical feasibility, cost effectiveness and statewide energy savings, and then a brief discussion on inflatable spas.

After my presentation, I'll discuss what the next steps are following this workshop, mention a few discussion topics to facilitate the comment period. And then a few other speakers will make their formal presentations and finally we'll open it up for comments.

The purpose of this workshop is to discuss the

changes since the last staff report and to get feedback from the public and stakeholders. The second revised staff report is available online at the link we've provided on this slide. The report contains details of the proposal that will be presented today.

Within Title 20 of the California Code of Regulations, there is a test method and a maximum standby power standard for spas. Our proposal is to update the test procedure to an industry accepted test method, update the standby power standard, and add a label requirement. The proposed items that have not changed from the previous staff proposal are the definition for portable electric spas, the addition of the terms exercise spas, combination spas, and standby mode. And the proposed standby power standard will also remain the same and apply to all portable electric spas.

New changes since the previous staff proposal are clarifying the test method for combination spas, the addition of the terms rated capacity, rated volume and fill volume, new data submittal requirements, updating the value limits on the performance bar and some of the wording on the label. And we've also updated the label requirement for combination spas. And I'll go through each of these in more detail in this presentation.

So the scope, since the last proposal remains

unchanged. The definition would maintain the existing broad definition. That includes storable or inflatable spas, flexible or soft spas, traditional spas, exercise or swim spas, and combination spas as illustrated on this slide.

A portable electric spa as currently defined, means a factory built electric spa or hot tub supplied with equipment for heating and circulating water. Staff has previously proposed to expand on this definition, but we believe the definition as it exists is clear and suitable and will remain unchanged. Thus all portable electric spas are still regulated.

The proposed definitions for exercise spa, combination spa, and standby mode are as follows:

For exercise spa, also known as a swim spa, the definition will be a portable electric spa designed to produce a water flow intended for water therapy or recreational physical activity including, but not limited to, swimming in place.

For combination spa, or combo spa, the definition will be an exercise spa with multiple reservoirs capable of heating each body of water.

And for standby mode, the definition will state that only default settings, as shipped by the manufacturer, are enabled except water temperature, which may be adjusted

to meet the test conditions. No manual operations are enabled as defined in ANSI APSC-ICC-14-2014. These additions provide clarification and elaborate the scope.

The proposed additional definitions include rated capacity, rated volume, and fill volume.

For rated capacity the definition will be the number of people capable of fitting in a portable electric spa as specified by the manufacturer.

For rated volume the definition will be the rated capacity of the portable electric spa, in gallons as specified by the manufacturer on the spa, on the spa packaging, or the spa marketing materials.

And for fill volume, the definition will be the water capacity of the portable electric spa in gallons, at the halfway point between the bottom of the skimmer opening and the top of the spa. In the absence of the skimmer, the water capacity is six inches below the top of the spa.

These terms are meant to support the items that are represented on the label and the data being requested during certification.

The proposed test method will continue to be ANSI/APSP ICC-14 Version 2014, but with a clarification for combination spas. Which will state, for combination spas each reservoir will be powered on simultaneously and heated to the appropriate temperature, according to the test

procedure for the entire duration of the tests.

Our proposal to update the standby power standard has also remained the same for spas manufactured on or after January 1st, 2006. And before January 1st, 2019 the standby standard is five times the volume to the two thirds. For spas manufactured on and after January 1st, 2019, the standby power standard is 3.75 times the volume to the two-thirds, plus 40.

For combination spas, each reservoir must meet the proposed standard in order for the entire unit to be compliant. The proposed standard tightens power consumption on larger spas and provides a modest relief for smaller spas.

The proposed label requirement will inform the consumer at the point of sale that the unit meets California's appliance efficiency standard and is certified to be sold in California. Informed consumers will lead to energy savings by allowing consumers to choose a more efficient unit.

The label closely resembles the original label in the proposed test method. The label includes a few modifications since the previous staff report, which are highlighted on this example. We've clarified the label will show the rated volume and not the fill volume. And in response to comments we've received from the previous staff

report, staff changed the boundary limits on the performance bar illustrated on the label to remain fixed as opposed to a function of volume. Because a performance bar based on the function of volume will skew the measured standby power to the right, reducing the effectiveness of the label to visually illustrate the range of energy efficiency.

Next, we provided a formula for how the total annual power consumption is calculated. We've also included a citation California Code of Regulations Title 20 Section 1608(a), to inform consumers that this unit and spa cover combination is compliant with the regulation.

In our previous staff report, we proposed a separate label for portable electric spas, exercise spas and combination spas. In response to the comments we received from the previous staff report, staff has reverted to using two labels, one for portable electric spas and one for exercise spas.

Combination spas will be labeled both with -- we'll be using both labels, one for the spa portion and one for the swim portion. The labels shall display the manufacturer and model number of the spa cover used during testing and indicate the spa cover is allowed for sale with the unit, in accordance with California Code of Regulations Title 20 Section 1608(a). And finally, the label must be

removed by the consumer only.

Here's an example of the proposed labels, one for a portable electric spa and then one for the exercise spa, and then one -- so the portable electric spa label will be used for the combo spa portion. And then the exercise spa label will be used for the swim portion of the spa.

The label includes the rated volume, the standby power resulting from the test procedure, the maximum allowable standby power, an estimate of the annual power consumption, the spa cover manufacturer and the spa cover model.

Data submittal requirements, the table shown in this slide is Table X, which shows the data submittal requirements when certifying to the appliance efficiency database or MAEDBS. The additions and alterations are the ones highlighted in yellow. Manufacturers shall identify the spa type, the test and spa cover model number, the test and spa cover manufacturer, state weather if the spa cover is insulated, the voltage, the rating capacity, state whether the spa enclosure is fully insulated, the rated volume, the fill volume and then the normalized standby power.

For models tested with more than one cover, only the covers that result in compliance may be sold with the unit at the point of sale to the consumer, which is

congruent with the language that exists in Section 1608 of the California Code of Regulations Title 20. Which requires that the unit is sold with only and all components, design characteristics and other features that effect energy or water consumption as the units are tested under the specified test procedure, and for which information was submitted to the database.

For the sake of the label, only the cover that yields the maximum standby test result shall represent the model on the label. And all unit and spa cover combinations that pass the standby power standard shall be certified to the appliance efficiency database.

The feasibility of our revised proposal relies on the data we've received in our appliance efficiency database. The data represents entries certified through the Energy Commission as of March 2017. During this time, more than 1,300 entries were in the database however only approximately 960 entries are used for this analysis due to anomalies in the data set.

More than 94 percent were traditional spas, 5 percent were exercise spas and less than 1 percent were combo spas.

The chart displayed on this slide shows the feasibility of these models against the proposed standard. The blue curve is the current standard. The red curve is

the proposed standard. And the green dots symbolize the models certified in our database. Noncompliant models are those above the red curve and compliant models are those below the red curve.

So the compliance for traditional spas is about 79 percent, 58 percent for exercise spas, and 43 percent for combo spas.

I want to make a note that the percentages for exercise spas and combo spas do not account for the change in testing temperature, but the new test procedure proposes for exercise spas and the swimming portion of combination spas, which reduces the testing water temperature by 15 degrees. So the compliance rates could be higher for both exercise spas and combo spas.

Also taking a closer look at the chart, you can see that the proposed standard provides some relief for smaller spas with a volume capacity less than 180 gallons.

Staff still believes, based on the data sets that we have in our database that improvements can be made in the market. Products may increase their efficiency by using better insulating practices or insulation materials, improving spa cover designs or insulation materials within the spa cover, incorporating radiant barriers and improving the controls.

In addition, the proposed standard test method,

the proposed standard and test method are performance based and technology neutral and are accepted by the industry.

Cost effectiveness. Our methodology for cost effectiveness is still based on the reports and studies of the differences between a noncompliant spa and a compliant spa. The life cycles include incremental costs that can make it more efficient and the label costs. The cost for traditional portable electric spas of $100.38 per unit. For exercise spas, the costs are $200.38 per unit. And the cost for combo spas is $232.50 per unit.

Since the study we reference for incremental costs did not distinguish between traditional and exercise spas, we looked at the price difference of the units in the market and we scaled the incremental costs to that. Based on a ten-year design life, we see that energy savings exceeds the life cycle cost.

The estimated total savings is 12 gigawatts after the first year and approximately 145 gigawatts per year after full stock turnover, which is equivalent to almost $27 million. The energy savings is based on two factors: the savings between noncompliant spas and compliant spas and the savings from requiring a label.

So I want to address inflatable spas. Since our previous staff report, we did receive some comments that provided new information, so I do want to address those

today. Respondents indicated inflatable spas are intended for seasonal use. That is six to seven of the warmest months of the year, due to possible damage to the inflatable spa material and the pump, when outdoor temperatures are below 40 degrees Fahrenheit.

However the California minimum average temperature is above 40 degrees Fahrenheit allowing these units to operate beyond the seasonal use in some regions. We also received the docketed test lab report showing a model with a capacity of 210 gallons resulted in a normalized standby power of 469 watts when the maximum allowable standby power is 176 watts for a spa of this capacity. That's roughly three times more than a traditional spa.

Staff believes the intended use and operational use are similar to regular spas. For example the water temperature in an inflatable spa is capable of reaching the same temperatures as a ridged spa, so from 60 degrees Fahrenheit to 104 degrees Fahrenheit.

Also, the proposed standard again provides relief for smaller spas below 180 gallons. And inflatable spas in the market have a volume capacity that ranges from 130 gallons to more than 260 gallons.

The proposed standard and test procedure are technology neutral and performance based. That is the

regulations do not restrict manufactures to design their spas to specific physical parameters or components.

That concludes my presentation for what was in the staff report. I briefly want to go over what the next steps are following this workshop, through the diagram of the rulemaking process.

The green call-out symbol indicates that there is an opportunity for public participation. We are currently in the stage indicated by the blue box. We are within the 45-day comment period that started when the second revised staff report was published on July 12th of this year.

And during this workshop we are seeking comments from the public and stakeholders. The next step is to analyze and address the comments received. And if there are no major changes, we will prepare a standardized regulatory impact assessment indicated by the yellow box.

So here are a couple of discussion items that we thought of. Do manufacturers see any recent improvement trends in the spa market? How are small spa businesses affected by the staff proposal? And these are just some questions to help facilitate the discussion during the comment period.

And then just as a reminder, comments are due by 5:00 p.m. on September 1st. The docket number for this appliance type is 15-AAER-02. Comments can be sent

electronically to the link shown on this slide or you can send hard copies to the Dockets Office. Or you can send digital copies to the docket email address.

This concludes my presentation and my contact information is on this slide. Please feel free to contact me with any questions or concerns. We will proceed to formal presentations, followed by a comment period. But I will allow some time for clarifying questions. Any general statements or comments should be held for the comment period.

And I'll take questions now in the room first. Do we have anyone online?

(No audible response.)

All right. So our next presenter is Chad and Charles Kim.

MR. KIM: Can you hear me?

MS. LOPEZ: Yes. We can hear you.

MR. KIM: Hello. Okay. Thank you. I'm Charles Kim of Southern California Edison Company. I'm speaking on behalf of the California Investor Owned Utilities.

Spas have been regulated since January 1st, the year 2006. Almost 12 years have passed since then. And we together have another milestone about (indiscernible), but it should be energy efficiency standards for spas.

California IOUs thoroughly reviewed the latest

staff report. And I must say it is well written and clearly demonstrated the cost effectiveness of a proposed energy efficiency updates. And certainly, technically feasible as demonstrated by the CEC staff.

I would like to point out three major goals that CEC has been trying to achieve here. First, clarification of definition. Second, updates on the energy efficiency standard with (indiscernible) for small spas. And third, label requirements, so that everyone can see, which is a qualifying product and which is not. And that so people have choices. Our customers have choices of buying more energy efficient spas. And label requirements, so they can achieve that.

Therefore California IOUs support all three major goals of this proceeding and look forward for a formal rulemaking. This proceeding will certainly benefit all Californians.

I'm here with the Chair today. And he will go over very specific items. Thank you CEC for leading this effort and once again thank you very much for a well written, well thought staff report. I greatly appreciate all of you. Thank you so much.

MS. LOPEZ: Thank you Charles. Next, we have Chad.

MR. WORTH: Can you hear me?

MS. LOPEZ: Yes. We can hear you.

MR. WORTH: Great. Audio is a much better response, so good afternoon. Again, my name is Chad Worth as Charles mentioned, with Energy Solutions on behalf of the California Investor Owned Utilities. Next slide.

As Charles mentioned, the IOUs have been involved in spa energy efficiency for a number of years. We were he first to propose a case study for portable electric spas back in 2004. These standards then first took effect in 2006. There were some questions about how spas were performing in the market and the IOUs worked to commission a study at Cal Poly in 2008, to verify the test procedure and savings. And then in 2012, this rulemaking began with CEC asking for a labeling proposal. Next slide.

As most of you know, the current standard is the normalized standby power shall not be greater than the five time volume to two-thirds and we'll get to the proposed standard in a minute. Next slide.

With regards to this current rulemaking on July 2013, IOUs submitted a labeling proposal to the CEC. About a year-and-a-half later, the CEC asked -- or sorry, not a year-and-a-half, that should be January 2014, CEC held a public meeting asking for a standards proposal in addition to a label.

At that point, we engaged with the APSP 14

Committee to negotiate what a label might look like as well as an updated standard level. And on May 15th, we got docketed the CASE report reflecting this consensus. The APSP Group took the lead and went ahead and published a new updated APSP ANSI standard in 2014 that reflected this new level and the label. And we've continued to participate in the last two staff workshops and provide comments in February 2016 and July 2016. Next slide.

Through these various staff reports and iterative process, we believe the proposal has improved significantly. A number of the issues have been resolved and with that we support the staff proposal alternative 3 and believe that the standards are cost effective and achievable. And will lead to significant savings as is pretty much been highlighted.

Three important changes that this staff report makes is the clarification of the definition, the updated standby standard, and then the label. Next slide.

Again, the current definition of portable electric spa, means the factory built electric spa or hot tub supplied with equipment for heating and circulating water, CEC staff has clarified this definition covers traditional, storable exercise and combination spas. Next slide.

Strengthening the standby standards, again we

worked with the APSP 14 Committee and went through a variety of numbers to come up with the new standard , based on the staff report I believe, more than 75 percent of models in the database will meet the proposed standard. Next slide.

When we first got started with the labeling design, the IOUs proposed two different label types just to get the conversation started. Though after working with the APSP Group, it evolved into the current design. Next slide please, which you see here and saw in the previous presentation there've been a number of minor tweaks to this label, of which I don't need to go into in depth. But in terms of how the ranges are set, how it applies to combination and exercise spas versus portable electric spas, how we referenced the cover and whatnot. A lot of these little things have been fixed over the last couple of staff reports. And we think it's in a very good place at this point. Next slide.

So with that, we'll continue to participate in the conversation here and if there are other issues we'll be certainly willing to bring those to the CEC's attention in our written comments. But at the time we just thank the staff for the staff report and look forward to the formal rulemaking process getting started. Thank you.

MS. LOPEZ: Thank you, Chad.

Then next we have Mathew Vartola from Bestway.

MR. VARTOLA: All right. Good morning everyone. Before I get started with today's presentation, I'd just like to take this opportunity to thank Ms. Lopez and her team number one, for their attentiveness to our questions and concerns during this process and also their attention to detail in understanding our product and our concerns as an industry.

There's no doubt that the proposed regulation that the CEC has brought forward does incur very good energy savings when it comes to the portable spa category. However, we have found ourselves once again locked out of the California market with our inflatable spa product. And we would like to bring forth a proposal to try to meet in the middle.

So for those of you who are not familiar, the product that I am talking about now is an inflatable spa. Basically an inflatable spa is a spa that is sold in retail in very compact retail packaging that consumers can easily load into their shopping carts and take home with them. It comes with basically two parts, which is an inflatable spa tub and a integrated filtration system, which includes filtration, heating and air jet capabilities.

Most spas that you find in the market are between 135 to 250 gallons of water capacity and reach a max

temperature of 104 degrees.

So with the inflatable spa industry, who really benefits from this type of product? First and foremost is the low-income consumer. These products usually range anywhere between $300 and $600, compared to the thousands of dollars that one might pay for a hard-sided portable spa. So obviously the investment on the consumer side initially is a lot less and a lot more manageable for those who do not have the ability to afford a hard-sided spa.

People in the renters markets, so if you are not a homeowner, you are maybe staying in a place temporarily, an inflatable spa is a perfect solution. You do not need to hard wire the spa to any type of electrical system in your home. It is just a 110 volt plug and play system that allows you to easily set up and easily take down when needed.

Retailers, so when you look at your standard big box regional retailers, a spa product is something that they usually don't sell. However, the inflatable spa offers them a perfect opportunity to reach that market and to benefit from this type of product, going out to consumers.

And last, but not least, the spa industry. So a product like this we see as a stepping stone product. Those people or families who are interested in possibly

investing in a spa, but don't know if they're going to be using it often enough or not sure if the kids are going to like it, this presents a perfect opportunity for them to make a low-cost investment to test out, to see if a spa is really something that their family would like. And then therefore can make the decision with more confidence about investing up to a more permanent hard sided solution.

So just some additional product information for you, I know Ms. Lopez covered some of this, but usually the lifespan on this spa is around three years. We do not see very many cases in which a consumer will be able to use this product more than three years due to really the inflatable nature of the spa liner itself. Taking it up and bringing it down does have some wear and tear nd three years is really what we see as the average of life span.

Seasonal use, what we see is more or less six to seven months. Because of the limitation on temperature any time you reach a situation where the temperature drops below 40 degrees, it doesn't matter if it's an average temperature or just a couple of days that this happens, the PVC liner of the spa is jeopardized. It will become cracked if temperatures get low enough and therefore rendering the spa useless.

And then just the California market size, so what we estimate back in 2015 the last time these spas were

legally allowed to be sold in California, the rough market size was about 15,000 units amongst consumers. So to the right here I just have a basic chart here, just letting you know kind of comparatively what an inflatable spa looks like compared to a hard side portable spa. So you can see it's a lot less of a product, a much more simplified product, and a lot lower of a price point.

So you know I think one thing that we often times overlook when we get into these discussions. We're talking a lot of data points. We're getting into a lot of industry specific information, but we lose sight of the consumer satisfaction.

Now, what we've done, we've run kind of a small cross section of consumer reviews as an industry on Amazon.com and WalMart.com. And when you just run a very basic search, searching for the word "affordability", you find quite a lot of satisfied customers calling out the fact that they are very happy with their purchase just based upon the fact that it was a low price point. They wanted a spa, however they didn't want to pay thousands of dollars for it. So therefore, they bought an inflatable spa.

I'm not sure if any of you sell products on Amazon or any other online retailer, but getting the five star review in general is not a very easy thing to do.

People will tell you millions of reasons why they don't like your product and not tell you why they like it. However, we found that the affordability aspect is something that people are very more than willing to go out and let us know about. So rather than go through all these, I would just like to leave these in the presentation for the Commission's consideration. So you can see five, four star reviews, going down the board here.

So this brings us to where we currently stand with inflatable spas based upon Title 20 regulations. Based upon the revised report that was recently published, inflatable spas are categorized amongst the greater category of portable spas. What does that do? It brings inflatable spas to a test standard that is impossible to meet based on the characteristics of an inflatable spa. You have a product that is inflatable PVC, so naturally there's going to be a higher rate of convection when the heat during the standby power testing just goes out the side walls. So as an industry, as the product currently stands, it is unable to come even close to those standards. And we recognize that.

So what we're looking to do and what we hope can be the result of these meetings and conversations is to meet the CEC in the middle. Now, if you look to the chart on the right side here, inflatable spas as they currently

stand, you're going to see around 500 watts in normalized standby power when it comes to the test method that the CEC runs. We completely understand that it's something that is not aligned with the goals of the CEC. However, what we are willing to do and through the past years of research and development amongst the industry, we feel comfortable with proposing a normalized standby power rate of 250. The 176 or 168 as I highlight here, that is the current maximum that the CEC allows, is just impossible to meet. It changes the whole nature of the inflatable spa and all the benefits that go along with it.

Now one aspect that the CEC is concerned about is the definition and possible loopholes that could be discovered in breaking out definitions between a storable spa, let's call them, and portable spa. So in collaboration with APSP 15, we developed a definition that we feel comfortable proposing in offering a separate category for these types of products. I'll go ahead and read it verbatim here.

"A free standing storable product, utilizing a collapsible main structure to form a vessel." This structure is capable of being disassembled, folded and stored during extended periods of non-use. Storable electric spas are supplied with a cord connected equipment package that integrates the pump, heater, blower and/or air

jet pump for water circulation, heating and sanitization. Storable electric spas are not designed or intended for long term use.

So what do we see as the advantage of this proposal? So where it currently stands, the annual energy consumption is reduced from the CEC calculated $59 per month, which annualized comes out to $34.41 by using the seven-month period to a $29 per month or $17 per month annualized energy cost.

When looking at the total energy consumed from the estimated 15,000 units that we previously had seen in the market, it would be a reduction of what we currently have as 39.6 gigawatts of power per year to 19.8. So this 19.8 number would represent roughly 1.42 percent of the total projected 2019 energy use of portable spas. And when you look at the actual volume of inflatable spas versus the greater category of portable spas, our product represents about 2 1/2 percent of the product in commerce, where our energy usage would only represent around 1 1/2 percent. So in general over the product lifespan the consumer would expect to pay around $612 of electricity over the product life cycle.

So, in conclusion, what we hope that the Commission can consider is that the proposed definitions and grouping of inflatable storable spas will allow number

one, the product to be offered to that low-income renter consumer that just doesn't want to make that investment into a hard sided thousand plus dollar spa. You know, there's no reason why we think that a spa should be a luxury item that is only available to be purchased by the economically privileged.

A spa should be a product that is widely available to the general population. So we humbly ask for the Commission's consideration in our proposal and our willingness to meet you guys in the middle, to be able to allow these inflatable spas to be sold in the market. Thank you.

MS. LOPEZ: Thank you, Matthew.

Next, we'll open it up for general comments or statements. I'll first begin with those in the room.

MR. COELHO: Am I on?

MS. LOPEZ: Go ahead and speak a little bit louder.

MR. COEHLO: Is that better?

MS. LOPEZ: Yeah.

MR. COEHLO: My name is Nathan Coehlo from Master Spas. Not much to say, I just wanted to thank the CEC for all the efforts they've put into this so far. And I very particularly want to commend the CEC for deciding to define swim spas so that there is clarity on the market for

whether or not that product is required to be compliant. So that's all I've got.

MS. LOPEZ: Thank you.

Anyone else in the room? If not, is there anyone online?

(No audible response.)

All right, since there's no more comments we're going to head out for a lunch break. And we'll return -- hold on.

MS. DRISKELL: We'll very briefly cover next steps in case anyone is planning on leaving after this session.

MR. STEUBEN: Kristin, before you move on, Chad did have question and was trying to connect through the line.

MR. WORTH: Hello?

MR. STEUBEN: Yeah. Go ahead, Chad.

MR. WORTH: Okay. Matthew, thank you for your presentation and crunching some of the numbers there. Perhaps I missed it or you went over it quickly, what are the technology improvements you see inflatable spas adopting to meet the level of energy reduction you're proposing?

MR. VARTOLA: Yes. This is Matt with Bestway. We have advancements in the way that we construct the

covers. There is a level of insulation that can be placed within the spa walls that still keeps it inflatable and storable and that basically covers it, so with the covers and the walls themselves.

MR. WORTH: Okay. Thank you.

MS. DRISKELL: Thanks, Chad.

So for anybody who's done with us for today, the next step in this process is to receive comments on the staff report, comments are due at 5:00 o'clock p.m. on September 1st. I will pull up that slide again before we leave.

After we receive your comments we will take a look and decide if we need to revise the staff analysis and hold another workshop or move forward with the revised staff analysis into the standardized regulatory impact assessment stage of this rulemaking shown on the bottom left-hand side of the screen.

If you'd like to submit comments, comments again are due 5:00 o'clock p.m. September 1st. You can submit them electronically on our website, through our e-commenting feature. Or you can send a hard copy to our Dockets Office to docket number 15-AAER-02. Or you can send a digital copy to docket@energy.ca.gov.

We'll now break for lunch. We'll start our next session with commercial clothes dryers at 1:00 o'clock p.m.

Thank you everyone.

(Off the record at 11:32 a.m.)

(On the record at 1:02 p.m.)

MR. ELLIOT: My name is Ed Elliot. I'm a Senior Engineer with the Codes and Standards Group for PG&E and today we're representing the California IOUs. I'd like to thank Shawn, Ryan and Jessica and Kristen for inviting us here today.

And what we need to do at this time is present an hour presentation for the California IOU Commercial Clothes Dryer Test Procedure. So at this time I'd like to introduce our Consultant, Suzanne Foster Porter of Kannah Consulting. Suzanne?

MR. NELSON: Thank you, Ed.

I'm going to give a short presentation and then I'll hand it back over to the California IOUs and the testing.

MR. ELLIOT: That's right,

MR. NELSON: Great.

Thank you everyone for joining us this afternoon. My name is Ryan Nelson. I'm a Senior Mechanical Engineer with the Appliance Outreach and Education Office. Today we'll be discussing the Draft Commercial Clothes Dryers Testing Certification and Marking Requirements.

Can everybody hear me online?

(Off mic colloquy to set up audio.)

MR. NELSON: Let me start over. Welcome everyone. My name is Ryan Nelson. I'm a Mechanical Engineer with the Appliances Outreach and Education Office. In this afternoon's session we'll be discussing the Draft Commercial Clothes Dryer's Testing Certification and Marking Requirements.

Today's agenda for this topic will cover the purpose of this workshop, the staff proposal will highlight some discussion topics to generate discussion, and then next steps. And then we'll hand it over to stakeholder presentations.

The purpose of today's workshop is to review the staff proposal for commercial tumble clothes dryers. Hopefully all stakeholders and everybody in the room has had a chance to review the report. The Commission, the Energy Commission is seeking comments regarding the proposed testing, certification and marking requirements. The draft staff report can be located at the following link in the presentation.

A little history, commercial clothes dryers have been an interest for several years now dating back to March 14th, 2012 when the Order Instituting Rulemaking was released. This OIR included among other appliances commercial clothes dryers. In March 2013 the Phase 1

invitation to participate was released, which also included the commercial clothes dryers.

Following the invitation to participate proposals were submitted by stakeholders for consideration. After further evaluation the Energy Commission determined that additional information would better support this rulemaking. And on May 28th, 2014 the Energy Commission requested additional information. In January of 2015, the California Investor Owned Utilities case team submitted a revised draft proposal. This proposal had recommended at the time the use of U.S. DOE, the U.S. Department of Energy test procedure with modifications. It was later suggested that a test procedure specifically for commercial tumble clothes dryers would be appropriate.

And that leads us to this year, 2017. On February 7th, 2017 the California IOU CASE team submitted a test procedure and proposal. On June 30th a revised version was posted to the docket and it's Version 2.6. This version included updated energy calculations and made a few other refinements.

And that brings us to the staff proposal. So why are we here today? Why are we recommending a test, a certification, a marking requirement for commercial tumble clothes dryers? It is estimated that over 500,000 commercial dryers operate in laundromats, hotels, motels,

multi-family complexes and other commercial industrial applications throughout California.

It's estimated these dryers consume 900 GWh of electricity and 260 million therms of natural gas per year. That's costing an estimated $440 million to operate.

Testing certification and marking will help provide consumers with valuable information to aid in decisions in purchasing new and replacement equipment. And provide data for use in a future rulemaking for a possible energy standard.

This figure provided from the CASE team, which they'll cover further in their presentation this afternoon. Just as a quick illustration of current models that have been tested, it illustrates ten models grouped by a capacity range indicated by the gray bars. You have 30 pound, 55 pound, 75 pound and 120 pound capacity ranges have currently been tested.

And just to highlight the difference in efficiencies of dryers within a certain capacity range, if you look at the 30 pound gray bar the dots, the solid dots indicate one run of -- there are six runs that have been tested in the proposed test procedures. That solid dot indicates one run each and then the (indiscernible) indicates an average of all runs. The bar connecting just the -- connects the extremes for that one dryer. So you'll

see the two different dryers there in the 30-pound range. That's approximately a 50 percent difference in energy, a combined energy factor for those two dryers tested within that capacity range.

The results show there could be substantial efficiency improvements made for commercial clothes dryers in the market of California.

Staff proposal scope, currently the scope is stated in the draft report, draft staff report. Our commercial dryers included within the scope will be a commercial tumble clothes dryer with a capacity greater than six cubic feet drum volume and less than or equal to 65 cubic feet.

These pictures indicate a wide range of types of dryers included within the scope. All the way on the left of the screen, looking like a residential-type dryer, the coin-operated for a laundromat and multifamily, and increasing in size as we go across to the right to your larger on-premises laundry commercial tumble clothes dryers.

Definitions, clothes dryer means a cabinet-like appliance that is designed to dry fabrics in a tumble-type drum with forced air circulation and that has a drum and blower driven by an electric motor.

Definition of a commercial tumble clothes dryer,

means a tumble clothes dryer not covered by 10 C.F.R. part 430.32(h) and that has a capacity larger than 6.0 cubic feet drum volume and less than or equal to 65 cubic feet drum volume.

Test method, so existing test methods and I may have a correction on this slide of a conversation earlier this afternoon at lunch. However, these all apply to residential clothes dryers, the U.S. Department of Energy has a standard test procedure referred to as DOE 2015; the Australian/New Zealand standards AS/NZS 2442.1; the American National Standard Institute and Association of Home Appliance Manufacturers or ANSI/AHAM HLD-1: 1992. And the International Electrotechnical Commission or IEC 121:1991.

After review of these test procedures, and previous rulemaking efforts it was determined that a new commercial clothes dryer test procedure would be appropriate. That leads us to the staff proposal to adopt the California Investor Owned Utilities Codes and Standards Enhancement or CASE, "Energy Efficiency Test Procedure for Commercial Clothes Dryers" Version 2.6, docketed June 30, 2017.

The California investor owned utilities and their representatives will make a more detailed presentation regarding the test procedure following this presentation.

Reporting requirements, the proposed reporting requirements in the draft staff report include the following listed in the table and I'll go down the list. Energy source, measured drum capacity, load size drum capacity, load weight capacity in pounds, gas heat input, electric heat input, voltage, combination washer/dryer, automatic termination control, combined energy factor or CEF. Elow; and PS, which would be power standby; PN, which would be power network mode, PW would wrinkle mode, and Poff would be power in off mode. And then power factor which would be an average power factor.

The last four listed here would be reported as indicated by the asterisk for the runs completed as prescribed under the test procedure. So the weight of the run for runs AB, C, D, E and F. So I've abbreviated the table that will be a reporting of these four items for each run as shown below the table.

MR. MESSNER: Hey, Ryan? Is it okay if I just ask a quick question on that or no?

MR. NELSON: Can we hold it until -- just I'm almost done (indiscernible) --

MR. MESSNER: Okay. It was just a clarify something, but okay. No problem.

MR. NELSON: You'll also notice along with energy and weight we are requesting the reporting of the time to

run each cycle during the test procedure. This is to allow a comparison of efficiency versus time to complete the test run, so we're not just looking at efficiency values. We're also evaluating how long it takes to complete the task.

So here's some discussion topics. Are the capacities proposed as in scope reasonable; as in 6 cubic feet to less than or equal to 65 cubic feet? Is application of the test procedure clear? Are the number of runs per test enough to capture the energy consumption of the appliance?

I would appreciate for all comments made today to please support your comment and that concludes my presentation for dryers. Our next steps in the rulemaking process, as mentioned earlier this morning we're here to discuss the draft analysis. And the next step for if there are revisions we revise the draft staff analysis with feedback and move on through the public participation process.

Comments can be sent and docketed until September 1st at 5:00 p.m. The docket for commercial clothes dryers is 17-AAER-01. You can eFile at the link shown on the screen or email them directly to docket@energy.ca.gov. Or if you prefer to send a paper copy send it to the address shown below.

To reiterate comments made this morning on

confidential information, if you wish to submit confidential information please contact us prior to submitting any data or information. Anything submitted prior to determination of confidential status would be pubic record.

Okay. Yeah, I'll take one question.

MR. MESSNER: Thanks, just on the reporting requirements two questions actually. The energy source, is that electric versus gas there but it says kilowatt hours. I was just confused by the energy. Is that the energy use or energy source, because a lot of times you have the energy which is gas or electric.

MR. NELSON: No, I'm sorry, gas or electric. It looks like I clipped it off when I shortened the table, so it would be the source gas or electric.

MR. MESSNER: Okay. And then so then the kilowatt hour per year on the right is not the --

MR. NELSON: No, that is Elow kWh, so the energy and low. Sorry, the two tables, to clarify it let me bring it back up on the screen.

MR. MESSNER: Okay.

MR. NELSON: So these are not the same tables. I mean, the same columns. Each one of those is a separate reporting, so energy sources is not carrying over.

MR. MESSNER: Oh, okay.

MR. NELSON: I should have clarified that a little bit in the table, so maybe that helps. So we're going down from energy source all the way down and then jumping over to the next right column starting Elow.

MR. MESSNER: Okay. Yeah, I see what you're saying. So then the other question I had then were the capacities. There's three reporting for capacities, is there a -- I mean that's fairly redundant. Is there a reason why you'd need capacity reported in three different ways?

MR. NELSON: Well, for measuring the CASE team will go into this in a little more detail. My understanding from the test procedure is that they're going to measure the drum capacity. There's a certain load capacity that is used for each run through the test procedure. So reporting those two and then there's the load weight capacity also associated with a commercial dryer.

So sometimes they're advertised as cubic foot or pounds, so we're just trying to collect that data to be clear on what is required in the test procedure and what is listed with the equipment from the manufacturer.

MR. MESSNER: All right. Okay. Thank you.

MR. NELSON: Okay. Great.

If there are no other comments or quick

questions, clarifying questions from the room I'm going to hand it over to the California investor owned utilities for their presentation.

Ed Elliot, do you want to make your introduction?

MR. ELLIOT: Okay. Sorry, Ryan (indiscernible) but I'm Ed Elliott with PG&E's Codes and Standards team, Senior Engineer, and we're representing the California IOUs today. And we want to thank Sean, Ryan, Jessica and Kristen for inviting us.

And without further comment we want to start presenting the California IOU Commercial Clothes Dryer Test Procedure. And here is our consultant, Suzanne Foster Porter from Kannah Consulting.

MS. FOSTER PORTER: Thanks, Ed. Welcome everyone online and in the room. I will do my best to keep this lively as I realize at least in the Pacific time zone we've just had lunch, so I'll try to keep you awake.

I'll ask you to hold your clarifying questions and comments until the end of the presentation. I'll take those all at the end. Please note that I have included slide numbers for your convenience, so if you have a question on a particular slide please feel free to notate that and we can come back to it at the end.

So thanks to the California Energy Commission for giving the Investor Owned Utility Case Team an opportunity

to present. Yes, Kevin?

MR. MESSNER: Sorry, I just -- one idea is it'd be helpful if possible, sometimes when you go through the slides there'll be questions that come up, which then the questions start building. And so then as you get to the end, so it can be helpful if it's possible to ask some clarifying questions along the way to help reduce a build-up of questions that compound as the slides go forward. Do you understand what I'm saying?

MS. FOSTER PORTER: Yeah, I understand. I think given the format we've got with folks online and folks in the room, it would be better if we wait until the end. So Kevin, if you get to a point where you don't understand the slides given the additional verbal attention I'll give to them, then do let me know. But I think we'll be all right, we'll take questions at the end. Thank you.

MR. MESSNER: Okay.

MS. FOSTER PORTER: So, as I was saying I wanted to thank the California Energy Commission again for giving us an opportunity to present the task procedure here today. This was developed by the CASE team, which is more than just myself. We have -- I'd like to thank Daniela Garcia, Ed Jerome, Dave Denkenberger and some of the other folks at the PG&E ATS facility who helped make this test procedure and worked hard to create it. I'm just here representing

the team, so wanted to mention them as well.

For those of you that are less familiar with commercial tumble dryers, basically the test procedure covers all dryers that are not covered by the current residential DOE test procedure up to 65 cubic feet of drum capacity.

Generally speaking, cool air comes in the intake of the dryer. This can be at the top or the back of the dryer. Then it's heated in the burner box, passes through the drum and then passes through a lint screen before it exists the dryer. This photo of a lint screen there in one particular dryer, you can see the exit point on the back here. It's the small round circular in the bottom right corner of the picture of the back of the dryer.

Ryan, it looks like we're getting some notes popping up. I don't know if there's any way to get rid of that, but we don't need those. Thanks. If not, it's okay. Thanks, Ryan.

Here's the measurements of one of the dryers that we measured in our lab as part of developing this test procedure. This is a relatively typical signature that we see with dryers. What you're looking at here is time in minutes along the bottom. This is for one dryer run. This happens to be a run where the textiles have been over-dried and for the various parameters here, each of these lines

represents a different measurement that we take in the course of the test.

The blue line is the total gas and electric power in kilowatts. The green line is the relative humidity of the exhaust. I'll note that for this measurement, what's important is this signature and not the absolute value, because there is some mixing with the room air when we take this measurement. The purple line is the weight of the load and there's some noise in this thing though because of the tumbling. We actually take this in real time with a scale that the dryer sits on. And finally, the red line is the temperature in Fahrenheit of the exhaust. There's also mixing of the room air with the exhaust.

I'd just like to point out that this is a typical signature that we would see. Basically the dryer, we load the load into the tumbler. The fan and the tumbler turn on. That's this little bump in the blue line you see at the beginning. Then there's a relatively steady gas flow. Once you reach a temperature of the exhaust that is high enough that the dryer signals that the burner should turn off, the burner turns off. And then cycles on and off until it reaches the end of the test. The temperature of the exhaust is cycling with that in that kind of sawed tooth pattern. Similarly, the relative humidity decreases when the burner comes on.

So this is a typical type test that we do. This is sort of what you do when you run a dryer, a test procedure run. This happens to be an overdrive test, so this gray line represents the point where the textiles are approximately dry.

As we discussed in the CASE report published in the docket, commercial dryers are in three kinds of facilities: multi-family, vented laundry and also in on-premises laundry or what's called in the industry, OPL.

The relative number in energy use varies with the different sizes of dryers. The largest number of dryers installed in the stock are represented by the multi-family category and the smallest number by the largest dryers. Similarly, the carbon emissions for the largest dryers are the biggest share of the three, because there is a lot of textiles being dried on the highter duty cycle than you find with the smaller multi-family machines.

There are a number of parameters that impact the energy use of dryers. I've shown five of these here. So if you look at this graphic along the bottom is drum volume in cubic feet. And to just give you an idea of approximately where multi-family, laundry mat and on-premises overlap with that, I have the bar shown at the bottom.

The five parameters that really do impact the

energy use in dryers do vary across the marketplace. One of those is IMC, or initial moisture contents of the load. That can vary depending on what washer you spin the textiles in.

Settings impact the energy use, intake air, load size and load type. All of these have an impact on energy use. There's not any specifically significant data about the average use of dryers that we could find. So because of that, we considered the range that these parameters might take in regular use, as we started to develop the test procedure.

There are a few trends that I'll point out here. One is intake air. So the intake air is basically the air that's going into the dryer. And in smaller dryers that tends to be conditioned air, like in an apartment building. But for the larger dryers usually these are pulling intake air, basically outdoor air, because they're vented to the outside. Otherwise, the volume of air of these large dryers that's going -- of the air that goes through these large dryers is significant. And so it would be a significant burden on the HVAC systems to try to do that makeup. So they use outdoor air.

Ryan already mentioned that commercial tumble dryers use a significant amount of energy in California. I'll just mention that it's almost half a billion dollars

in utility bills that businesses and apartment buildings pay every year to operate the dryers. And it's about the greenhouse gas emission equivalent is about two-thirds of a 500 megawatt coal fired power plant.

As Ryan pointed out, dryers in the marketplace have significant differences in efficiency. The same unit that Ryan mentioned, I'll have some more details on it on screen here. We measured two dryers of approximately 30 pounds capacity. One was 60 percent more efficient than the other. Their prices were very similar for when we purchased these dryers for testing.

The other thing I'll point out is that the standby power for the more efficient dryer was also approximately a quarter of the standby power for the less efficient dryer.

There are also a number of technologies. So we see evidence with our empirical measurements, that there's difference in the marketplace. But we also know from out technical research that there are different technologies that can improve dryers. One of those is heat exchangers. These are used in industrial applications and commonly used in buildings -- I should say industrial applications of dryers. And they're also used in buildings to recover heat from an exhaust stream and transfer it to the intake stream. There have been studies done on using heat

exchangers in dryers. The savings are between 8 and 40 percent.

Burner and fan modulation is another opportunity that can be employed to improve the efficiency of dryers. There are dryers in the marketplace today that use burner modulation, available for manufacturers. We're looking at somewhere between you know, a very small amount of savings. If you're just doing burner modulation with fan and burner modulation it can be up to 25 percent savings. That's from a DOE study. These citations are in the CASE report, if you'd like to see those.

Both of the two technologies are applicable to both gas and electric. There's a heat pump, which is an opportunity for electric only dryers. Savings are bigger here, between 13 and 60 percent. And then there are a variety of other technologies including controls, air recirculation, air sealing, improved motors and these in total could improve it approximately 15 to 20 percent.

So we know that there are differences in the marketplace today. There are technologies that can improve dryers. One of the concerns or questions we had was well is there room in the installation to include some of these technologies? Because sometimes it takes a little bit more room than what we'd use, a standard cabinet. What we see is that there's typically installations with dryers, even

with dryers that are dual pocket or what you might think of it as stacked dryers, there's room above those dryers for additional equipment that can improve the efficiency such as a heat exchanger or a compressor for a heat pump.

The other thing that we learned in our research is that owners of laundromats and other businesses do care about efficiency. The Coin Laundry Association is an association of laundromat owners nationwide. They are typically mom and pop-type small businesses in California and elsewhere that operate laundromats. Every year they have an industry association that many of them belong to, and every year they do a survey to understand what are the trends in their industry. They ask their members the question, "What do you feel are the biggest problems you face in the laundry business?" And high cost of utilities was one of the biggest problems for 65 percent of the respondents.

Also, in this survey it indicated that utilities are on average between 25 and 35 of gross revenue for many of these businesses. And so they're looking for ways to reduce their utility costs.

Furthermore, for national chains like or in large hotel chains like Marriott and Hilton, many of these large companies have a sustainability plans and GHG targets of their own that their shareholders have asked them to meet.

And many of them are having problems meeting it. They've installed more efficient lighting. They've done what they can with HVAC. And they've done what they can, especially in the hotel industry they're not able to control how things are used especially in the rooms. So they're looking for opportunities to further reduce their energy use. And so dryers could be one of those things.

Finally, utility costs of shared spaces in apartment buildings are passed on to apartment holders in some way or another either by increased rents or by increased subsidies. And so reducing utility costs of those shared laundry rooms can benefit some of the most economically disadvantaged Californians, who live in apartment buildings.

Unfortunately, even though there's a lot of interest, or I should say a lot of focus on reducing energy use by these businesses, there's not a lot of information about the differences among the dryers, how efficient they are, but also how they perform. So these are a few examples of quotes pulled from individual specification sheets from dryers that we reviewed as part of our research. And most of these -- it's difficult to -- if you're making a decision about which dryer to buy, it's difficult to compare these statements and make a decision about what is the most efficient dryer.

The test procedures that are available today for efficiency are targeted to the residential market. There are also safety test procedures that are not shown here in this list for natural gas and electricity that are covered by the CSA organization. So they're not included here because they don't address energy.

But just to give you a summary, I think -- Ryan, you covered these first three, showing the table left to right. The utility test protocol, I'll mention briefly, is an additional protocol that was developed by utilities entities including Pacific Gas and Electric and the Northwest Energy Efficiency Alliance, to evaluate the energy performance of residential tumble dryers. It was developed as a supplement to U.S. Department of Energy test procedure, to gather additional information above and beyond what DOE gathers.

A couple of things I'll point out. These are some characteristics, and this is also in the report, but a couple of things -- the test series ranges from about 5 1 run to 5 runs per dryer. Sometimes program time is measured and sometimes it's not. So that's just a couple of ways that these vary.

AHAM and Alliance Laundry Systems submitted comments to the docket earlier, indicating their concerns with trying to apply the residential test procedure to the

commercial market. Some of the comments are shown here on the slide. Commercial dryers tend to dry larger loads than residential. The cycle time is shorter. Times drying is typically used as opposed to automatic termination. And there's a wider range of drum volumes and so forth.

In addition to those, we also identified that there are different load types, compared to residential in terms of the textiles. That the air intake can differ from commercial to residential. And finally, that the range of facilities where these are installed is broader than residential. It's not just installed in homes and apartments, but we're installing them in a wide range of facilities; hotels, motels, and dedicated laundry facilities, apartment buildings, where the users that operate those appliances have varying levels of training and understanding of the device.

So the California Investor Owned Utility CASE team undertook a project to develop a new test procedure that more appropriately addressed commercial tumble dryers. And our objectives when developing this test procedure were to meet what we call the four Rs. We want to test procedure to be representative. We want it to be repeatable, meaning if we test the product multiple times in the same facility we get the same results. We want it to be reproducible, which is if you take the same product

from lab to lab and test it, you'll get a highly similar result. And we want it to be reasonable, which means we don't want it to cost too much to perform the test relative to the benefit that we get from the information.

In particular, we really tried to balance all of these. It was particularly important for us to balance, to have a representative test procedure. No test procedure is exactly as you will -- you can't test as exactly as it will be in the field in terms of exactly how it's going to be used. But we made efforts to try to represent what could be possible in the field with the test procedure.

We took a number of methods as we investigated what would be the best approach. We did a lit review, expert interviews, site visits, and then lab testing, extensive lab testing of products that exist.

So in summary the scope, this is similar to what Ryan said. We're looking at commercial dryers up to 65 cubic feet of drum capacity. That includes residential platform and large chassis-style tumblers. We are looking at gas and electric only, not steam models. And based on our market information that we have from the TRC market study that also published to the docket our estimates for this covers about 85 percent of dryer energy use in California.

So next I'm going to talk a little bit about some

of the requirements in the test procedures. And walk you through a little bit, or I should say kind of a sequence of what the testing looks like.

There are a number of installation requirements for the test procedure. The purpose of this is to ensure repeatability and reproducibility. So we have a lot of specifics about the room, which is a picture shown on the far left that the dryer should be tested in, what's the humidity and temperature of that room and how much can it vary. We had a standardize exhaust simulator that simulates the back pressure that is placed on a dryer in installation. This is modeled after the AHAM residential exhaust simulator.

And then we have various other instrumentation distances required in the setup to ensure repeatability. So what you're seeing here on the far right side of the screen is the end of the exhaust simulator, which blows into our harnessing bell. (phonetic) This is within the dryer chamber and this is the way we get the exhaust out of the chamber without -- and enabling us to maintain the temperature and humidity of the room.

There are a number of other requirements that I won't go through in detail here, but I'm happy to take any questions about after the presentation.

The test load specified, as we start to move to

okay once we have the dryer installed let's put the other test load of textiles. We specified the IEC-60456 test load. It's a cotton test load that's been in use. It's used in the AHAM test procedure, so it's well established. It's available from U.S. suppliers. It's also tightly specified for the purposes of repeatability and reproducibility. Our studies of this test load indicated that it behaves very similarly to a real world test load at full capacity, so in fact almost identically. So that was the other reason why this was chosen is because it's relatively representative of a real test load.

The way it's specified is there are three articles, a bedsheet, pillow case and a hand towel. It's roughly equal sizes, or excuse me roughly equal weights from each make up the load. There are two load sizes, a filling factor of 2.5 pounds per cubic foot. That is meant to represent full size and then there's a partial size, which is half of that.

Again, we don't have any statistically significant data on what the actual load sizes are in commercial dryers. We know from our site visits and our expert interviews that they vary, that partial load size is present. And because partial load size is an important component and effects efficiency, the test procedure includes those two load sizes.

Finally, the test procedure harmonizes with the IEC, not only in the types of articles that we specify, but also in the way that we keep those articles repeatable through normalization. So there's a sequence that's required every 9 to 12 runs where we normalize. There's an age weighting requirement for the load. All of that mimics and harmonizes with the IEC and the AHAM test procedures that are already in use for residential.

Once you have the load built specification, then the next step is to precondition the textiles, bone dry and moisten them for testing. The photo that we're looking at here is the site that we use to do that in the PG&E San Ramon facility.

I'll just note that we do have requirements for water hardness and electrical conductivity for certain parts of the preconditioning and normalizing sequence. And we use the bone dry procedure that harmonizes with the U.S. Department of Energy. We have two initial moisture contents: 60 and 75 percent, to represent the range of classical moisture contents in the field. And I mentioned the normalization here.

So the other thing that we did when we started this process is we looked at the U.S. Department of Energy specifications for measurements and looked at the error that we would expect to have -- in the error that we would

expect from each measurement in the energy value that we wanted, basically the total energy use over the cycle

And we evaluated the DOE tolerances for each piece of equipment including relative humidity, temperature, etcetera. And said, "Is it worth the extra cost of getting equipment that is more expensive?" Because every time you get equipment, that is more precise with smaller error, it costs more to purchase. So we did a detailed error analysis, because residential dryers are different from commercial and made some changes. In some cases we tightened certain tolerances and in some cases we relaxed certain tolerances on equipment and the test procedure.

So two examples where we did that, we increased the accuracy of the scale for weighing the textiles. Part of that is because for larger loads it's easier to get you air down with a large scale, so that incremental cost is not as high as it might be for a smaller load. But then it also significantly improves our moisture content, which impacts the way we adjust for efficiency.

But on the flip side of that, we also decreased the accuracy of the electrical supply and electrical measuring equipment required for gas dryers, because on average gas dryers, the total energy use is of the gas and maybe up to 5 percent of that energy use is actually

electric, for a gas dryer. So it doesn't matter very much, essentially. So we reduced the tolerances on that.

Roughly, once you've wet the textiles, you've normalize the textiles, they come out of the washer, you put them on the scale, that's the picture that's shown on the left-hand side. Then you take the textiles, you put them in the dryer, tumble it, measure the gas and electric use. You're monitoring the chamber temperature and humidity to make sure everything is within tolerance. And then the dryer itself terminates you remove the textile and measure it again on the scale, so that's basically how the test works. We also measure program time and report that as well.

One unique feature of the test procedure, compared to DOE, but more similar to other test procedures for dryers and washers is that the DOE conducts a single test with a single point, with a single load, so you get one number. So what we're looking at here just a comparison of DOE tests and IOU proposed tests. The vertical axis here is combined energy factor. That's the DOE metric. It's pounds of bone dry textile, per total kilowatt hour gas and electric.

And so this is just an illustration that in the IOU proposed test, given the range of circumstances that we see where commercial tumble dryers are used and installed,

we felt it was important not only to represent one number that might be an average use. But to also represent a range of use, because in some facilities use may look more a very challenging condition, where you have a wet load that's a partial load.

An example of this is like a textile jean processing facility, where the jeans are heavy. They're put into small loads and dried. And in some facilities, you may be using automatic termination over favorable conditions. So we wanted to represent not only the average, but also the range of use that we could reasonably conduct in a laboratory.

The specifics of those tests are shown in this table. The runs are labeled A through F. We chose these runs, because first of all we know that for the first test shortest time is a common -- time is often the most important feature, so we included that. We also included a condition that we observed regularly in the field and the experts told us happens a lot, which is an over dry. Basically that the dryer's run for longer than it needs to be to dry the textiles.

But then in addition to those, we combined all the variables that we know make the efficiency higher. And we called that the favorable condition, or favorable test. And then we combined all the variables that make the

testing more challenging.

We do not believe that D or E, the challenging or the favorable condition, is a normal condition that you would see all the time in that particular facility. The purpose of these tests is to create the range.

I should also mention there's one test with automatic termination for those dryers that do have automatic termination capability.

Our testing investigation included eight dryers in 2016. The characteristics of those dryers are shown with the same graphic I showed earlier. The size of the dryers roughly corresponds to the weight capacity of those dryers. We selected four dryers that were standard or baseline and then four dryers that we believed or at least were advertised to be more efficient. Those were shown in green.

The filled in yellow circles are the ones that we did detailed investigation on before we developed the test procedure to understand about how initial moisture content, load size and load composition, etcetera, affected the performance of commercial tumble dryers.

These are a summary of all the results from the test procedure that we have so far. The black dots as markers are the test from 2016. These are included in the CASE report that is docketed. The blue markers that you

see on screen are for data that just recently were produced. And so those are not on the docket.

Again, just to orient you here the vertical axis is site energy factor. So this is the pounds of bone dry textile that the dryer produces per kilowatt hour. Kilowatt hours include both gas and electric energy use. In this case, higher is better from an efficiency standpoint.

What we see along the vertical axis is a cubic feet of drum volume. And just for annotation I've kind of grouped those together that are approximately 30, 55, 75 and 120 pound categories. These are roughly categories that are considered in the market when purchasers go out to buy.

A few things that I'll point out, Ryan already pointed out the 60 percent difference between these two dryers. But the more recent data that we've collected shows that there's also variation in the larger dryers. So this is about a 20 percent improvement from here to here, with the dryer we tested just recently. So not only are there differences in the average, but there are also differences among the range of use.

So for example, if you look at the dryer, this particular dryer, the 75-pound dryer, it has a very tight distribution. You know, maybe only a variation of 0.5

pounds per site kilowatt hour regardless of how you use it. You give it a wet load. You give it a small load. The distribution is pretty tight.

Let's compare that to this dryer that we just recently tested in the 55-pound category, where the range of use is quite wide. So even though the average is just similar to the other two dryers that we tested in 2016, in a challenging condition this dryer performs significantly worse, from an efficiency perspective than the dryers that are also in that category.

But it also performed significantly better in the most favorable conditions.

So one thing that we're noting, as we consider the test procedure is that the test procedure gives us visibility on this range, which could be important to buyers who may care a little bit more about consistency in the efficiency values.

We can also look at these data in terms of costs, because that's something that businesses care about a lot. And so when California business owners go to out to buy a dryer one of the ways the test procedure can be used is we can consider dollar values. So what we have in this axis here is U.S. dollars to dry 100 pounds of bone dry textiles, so this is basically in this case lower is better. We want a lower cost for the utilities, for the

utility bills.

If we just look at two extremes there, just for illustration dryer four is about $3 per 100 pounds of undried textiles. On the utility bill, dryer five's under $2. That may not seem like a lot when you go to buy a cup of coffee. But with the volumes of laundry that our market research showed happen in California, that's a lot of dollars that businesses are spending.

So if we just consider three different scenarios: universities and colleges, hotels and motels and nursing homes, each of which had an increasing number of pounds of textiles per year that they have to dry and process, this is the difference in the operating costs of those two dryers, at $2 and $1.85. And over the course of a year, it can be thousands of dollars. Over the course of the lifetime of the dryer, it can be tens of thousands of dollars. So these differences really do matter when it comes to businesses and as they try to cut their operational costs.

In addition to the site energy, which is shown in the test procedures and the costs, which I just showed here, the test procedure can also be used to look at dryer performance in terms of other metrics, like for example carbon dioxide emissions. So the way that the test procedure is set up the values that we get out of the test

procedures can be used in a lot of different ways for utilities, policy makers and other stakeholders that might be interested in different types of costs of the dryers.

We talked a couple of times about the metric, but just very specifically what is in this metric? There's two metrics defined in the test procedure in Version 2.6, which is the most recent version published about a month ago to the docket.

The energy factor is the one that CEC is asking for a collection of. It's a site energy factor. It's basically you take the bone dry weight, which is the weight of the textiles without any water in them at all, and you divide that by the sum of the energy used , over the course of the cycle, the electric energy use over the course of the cycle and a portion of the electric energy used that's attributed by the low power modes.

I didn't talk very much about low power mode today, but the test procedure specifies that the measurement of low power modes including power in standby, the power in network mode and the power in wrinkle prevention mode, which is a mode that often occurs by default after the dryer has finished its cycle to ensure that the textiles don't wrinkle. It's a periodic tumbling of the textiles from time to time.

You can also put constants in front of these

values and get some kind of other metric. That's how I developed the cost metric I showed you earlier. But the test procedure provides for that although values of alpha and beta, although values of alpha and beta are not given in the test procedure. And that's called a cost benefit factor.

In addition to the individual metrics for the run, the test procedure proposes an average. And I showed that to you earlier. It was the open dot on the screen in the dryer data slide. We're proposing a simple arithmetic average of runs, of the shortest energy run, over dry mode, favorable and challenging. And then if the dryer has an automatic termination function, we also proposed that that be tested and included.

In addition, we proposed an average cycle time. So in every run the cycle kind of included performances and important part of dryers, basically how fast we can finish. It's important to the business owners and as they're working to move through the textiles they have to process. And so we also include an average cycle time and we're proposing a written mathematic average.

For those of you that have not had an opportunity to review the Version 2.6, which was the post a month ago to the docket there are track changes on to Version 2.5 as well as a clean copy. Just at a high level we changed just

a small number of things. We did some revisions to the calculations to enable discrete gas and electric values to be reported. We changed some information or I should say we added information to enable clearer guidance for measurement in son of a largest tumble dryers. We refined for language in automatic termination test to be more appropriate for the commercial programs that we see. And then finally, we added information about dual pocket dryers and washer-dryer combination units to clarify how those should be tested.

So in summary, there are a number of benefits to this test procedure. Especially as we look in comparison to the residential test procedure, we feel that we have a good proposal and we look forward to folks commenting on it. We are balancing the four Rs: repeatability, reproducibility, representativeness and reasonableness for the test procedure. We feel that we've come up with something that's a good starting point for the commercial market.

We feel that it's more representative than the U.S. Department of Energy, because we're conducting multiple tests instead of just a single test in one condition. And that the commercial market really dictates the need for this, because there's such a variety of news and there's not data on average load sizes and so forth,

while these is in the residential market.

And we made every effort to harmonize where we could with existing test procedures to reduce burden and to leverage the work that's been done before. And from a burden perspective, it's significantly less burdensome than for example the U. S. Department of Energy washer test procedure where 9 runs are required on up to 3 washers, which results in as many as 27 tests. By comparison, we're looking at 6 here.

So this is really the first step for the California IOUs to realize savings in California, through utility programs, in future mandatory standards when that becomes appropriate. The savings are large. We're looking at $90 million in utility bill savings for just a 20 percent reduction in energy use for these devices. And that's 360,000 metric tons of CO2 equivalent.

So thank you for your time. I appreciate your attention, and Kevin for your understanding and an interest in finishing in the time that I have allotted. And I look forward to any questions that you might have. Thank you.

MR. NELSON: Thank you, Suzanne.

We'll take comments from the room first. Does anybody have questions or comments?

MR. MESSNER: I have a lot. So I'm happy of other people have just one or two to go, if they want to.

Okay.

MR. NELSON: Why don't you start? Please state your name for the record then.

MR. MESSNER: Kevin Messner, I'm with the Association of Home Appliance Manufacturers. Thank you for the presentation and you actually answered a few of my questions. So thank you. And I'll just go through. It may not be the most -- well I don't know if the best way is if you want to go through is slide by slide, because I was taking notes.

MS. FOSTER PORTER: That's fine.

MR. MESSNER: Okay.

MR. NELSON: Kevin, let me say this. Please ask your questions and comments. If they're very technical in nature, maybe we can put those in writing and respond to those later. But general, in the presentation what was presented, say we can definitely handle those.

MR. MESSNER: Okay, sounds good. Yes, we will definitely put it in writing. And I don't think it'll take too long.

So I guess starting on slide six, I had a question. You mentioned that there's about two-thirds of a 500 megawatt coal fire power plant at a bottom row. And I was curious on how much energy you think this would be saved. At the end you mentioned that if you assume a 20

percent increase in energy efficiency -- I'm just curious out of -- the total energy's two-thirds. So how much would even under your best estimate, how much energy you shaved, does that two-thirds of a power plant go down to one-eighth below it? Or I mean, really how much energy are we talking about?

MS. FORSTER PORTER: So of course in the test procedure we're not proposing any specific savings estimate, but we did in the case report that docketed provide two estimates for savings based on the empirical data that we collected in the marketplace and the technology review that we did.

From that we might remember some of those ranges were pretty wide. But we made two savings estimates. The first is a 20 percent reduction. And so the numbers that you saw at the end of my presentation, the $90 million off the 20 percent reduction, we think it is possible to get to a 50 percent reduction. So in that case that two-thirds of a power plant would become a third of a power plant of use, is one way to think of it. So that's just a 50 percent.

So we're looking at between 20 and 50 percent savings is what we think is possible based on what we've observed empirically and through our literature review.

MR. MESSNER: Okay. Thank you. And the next slide, you said that -- we were curious on the age and the

price points of the units you had and maybe it would be helpful if you could give us the model of the units that you tested. And then that would help too to try to understand this as well. You said the price points were very similar. But would it be possible to get the models that you guys tested, so as we develop our written comments, we can be a little more educated?

MS. FORSTER PORTER: Unfortunately, for legal liability reasons, we do not provide manufacturer or model information for any of the products that we subject to testing. And the reason for that is the purpose of our engagement for the utilities is to not to endorse or to disparage any specific manufacturer, but rather to reveal the opportunity that is in the marketplace. So that there's no confusion about what we're trying to do, we do not reveal any factor and model information.

There is a table at the end of the case report that's docketed, which gives additional information about each dryer. They're identified by number. So that's about the information we're able to provide.

MR. MESSNER: Is the age and the price point range in that data that's available to us? Because it makes a difference whether you tested a dryer that's a year old or 50 years old.

MS. FOSTER PORTER: So I can speak to that. All

of these -- let's see, so we did -- these dryers were procured in 2015, late 2015, so they are new models. They are still, the last time I checked, which was a couple of months ago, these models are still available on the market list.

MR. MESSNER: Okay. And then the next slide you mentioned a lot of options that are out there as feasible heat exchange or heat pump. Yeah, I noticed there was different things. I was wondering if you also looked at how much each of those options would cost. I mean, sure there's a lot of things that are feasible for a price.

MS. FOSTER PORTER: So the report that we have published on the docket does not do a detailed cost analysis. That wasn't the primary purpose of the report, however the CASE team is preparing in this calendar year an engineering report that will include detailed cost analysis of different technologies.

MR. MESSNER: Okay. Thank you.

MS. FOSTER PORTER: So stay tuned for that.

MR. MESSNER: When did you say that you think that would be? You said fall or later?

MS. FOSTER PORTER: It will be in this calendar year.

MR. MESSNER: Okay. Great. And then on the heat pump models, did you see any or have you seen any heat pump

dryers that were not using HFCs as their refrigerant?

MS. FOSTER PORTER: So I am only aware of one commercial heat pump model that's available for sale in the U.S. There may be others. I did not, when I spoke with that manufacturer about their model, I did not specifically ask them about the refrigerants that they used, however I could follow up. So I don't know the answer to that question.

MR. MESSNER: Okay. All right, thank you.

Let's see, the next slide nine, yeah so I guess this goes to and maybe -- yeah, in the next slide too, you talked about how there's opportunities for efficient technologies and the Coin Laundry Association, I guess did their study. And did you look at whether the operators, how much they're more they're willing to pay? I mean there's a cost benefit they could save on their energy bill.

And I guess I should also clarify that AHAM represents just the residential platform, residential dryers that are on the same platform that are commercial, so in that space. But if your just rough of the back of the envelope estimations, your increase of let's say 10 percent of the energy you're going to save people about 80 cents a month. And on their energy bill that's not a lot to a laundry mat owner if he's going to have to pay I don't

know how much more for that.

So if you ask a question to somebody, "Hey, do you want to save on your energy bill," the answer's going to be, "Yes." If the answer is, "You're going to save on your energy bill, but you're going to have to pay X number of dollars more for this unit," then you're going to get a different answer.

I'm wondering if you asked the question in that way or whether you don't want to piece meal out answers that are, you know, polling questions. It depends on how you ask the question.

MS. FOSTER PORTER: Yeah. So we did not conduct the study that I cited from the Coin Laundry Association. And the specific way they asked the question I did put up on the slide. "What are your biggest problems that you face?" Their response was high utilities.

So but fundamentally from a policy perspective, what matters most is cost effectiveness in terms of the state has a long history of adopting standards that increase first cost, because it saves energy over the lifetime of the product.

So from that perspective, that's the test that we're most focused on for our investigation that we're doing this year.

MR. MESSNER: So I would just encourage you to

maybe think about payback and talk to laundry mat owners. And if their answer is, "Yes, the high cost of utilities," then that does not necessarily equate to, "I want to pay more for my dryers," to have more efficient dryers. That to me is a leap, if that's where it's heading.

So that means I want lower rates from PG&E. It doesn't mean to spend more on their dryer necessarily. And there's a payback too if you if you say, "Okay, you're going to save 80 cents a month and the life of the dryer is 14 years." Usually from a residential side it's two to three years, so payback where people actually start thinking. So I think you should, if you haven't delved into those a little more as well.

MS. FOSTER PORTER: Yeah, so I keep using the term 80 cents a month, but from AHAM's own estimates that they submitted to the docket, the duty cycle of these dryers is significantly higher than like a residential dryer. And so the energy use per month is going to be more than residential. So we are looking at payback periods. You know you're talking about simple paybacks. We do look at that.

Because of the higher duty cycle, there are a lot of technologies that can be cost effective. And eventually you reach a point if you keep applying technologies. The way the theory goes is that you apply technologies and the

first ones are less costly, but as you apply technologies, eventually you approach maxed tech. (phonetic) We've all seen this in some of the DOE documents. It's the same kind of analysis that we're dealing with.

MR. MESSNER: Okay. So then this maybe gets to (indiscernible) on Slide 12, where you talk about the different test procedures. And this may go to the heart of where we're thinking. It's two things: one is -- and you hit on the repeatability, reproducibility and then the representation. That's a balance that it's always the discussion. And it happens at the federal level, obviously, and I see it everywhere for dryers. And that's we had the DOE test procedure that uses the test cloth. And that is for the purposes for reproducibility and repeatability that then is in the ENERGY STAR database, it's in the DOE database. It's in the CEC database for residential dryers.

And for certifications issues, we have the CEC with new authority on providing fines to the manufacturers even if they do a paperwork error, and there's no consumer impact. But these are the things that we are worried about. So we understand that theoretically in a lab it would be great to show consumer representation, but then you lose, as you have that lever, you lose the balance. And you can't have it repeatable and reproducible.

And that's where there's a reason why you talk about the IEC and AHAM test procedures are being used. They aren't. They're in the sense of DOE has the dryer test procedure. That's the test procedure we'll use for energy and IEC is not a test procedure. There's a draft form and that type of thing, but for energy it's the DOE test procedure that's being used. So by creating a wholly unique, very unrepeatable irreproducible test procedure that then will create data in a CEC database that conflicts with the residential dryer database -- where consumers wouldn't have conflicting -- different test procedures I guess conflicting is the wrong thing. But differing test procedures, one that's not very reproducible, we oppose.

And the other thing is that you mention is that DOE only runs one test. And I don't know, I have to check on this, but generally what happens with DOE is you manufactures have the option of just testing one product. But that's at their own risk, in the sense of during verification, there could be two, three in their standard deviations. There's a little mathematical and statistical formula and they have to be sure they're under that.

So one test does not necessarily mean A, it's just one test for DOE, so it's not very good. It means that it's less burdensome and it's risky for the manufacturer that they were to rely on one test and how

they want to rate. So I think that's little mischaracterized that DOE is one test, so this is better because there's more tests. Better or more tests means more burden, and less really that -- no benefits based on that burden. So that's a comment.

And then --

MS. FOSTER PORTER: I'd like to respond to that if I can?

MR. MESSNER: Sure.

MS. FOSTER PORTER: So what I heard, just to make sure I understand you Kevin, this is Suazanne. I'm sorry, I haven't been saying my name, but I guess there's only two of us here.

So to respond to your question or comment about the test clause, so we did detailed investigations to identify the best test load that would be a balance of repeatability, reproducibility and representativeness. We considered real world clothing, but specified in the utility test protocol -- I'm not sure if you're familiar with that, but it's basically buying clothing from a U.S. clothing manufacturer and then it includes jeans and so forth. And so we looked at that. We looked at the U.S. Department of Energy, test clause. We looked at the IEC cotton and we looked at the IEC synthetic. So we compare for looks, before we made this choice to try to balance

what would be real world.

What we found was utility test protocol load and the IEC test cotton load that was specified were very similar in their performance. They weren't identical, but they were very similar. And the DOE test clause has been shown multiple times to not be representative of a residential test clause -- excuse me, residential clothing and loads, which is part of the reason why the utilities developed the utility test protocol. So --

MR. MESSNER: Right, but the reason for that is because you are breaking the law if you submit a non-energy amount that ends up being verified as incorrect. And as far as we can tell you did no repeatability or reproducibility test at all in the same lab. And the real world clothes is not reproduced when not repeatable, so (indiscernible) Okay.

MS. FOSTER PORTER: So I'd like to finish please, Kevin.

MR. MESSNER: Okay.

MS. FOSTER PORTER: So we did a lot of work to look at different loads. We selected the IEC protocol commercial, excuse me, cotton load and we did repeatability studies with that load in our lab. We did that for two dryers and then we calculated no (phonetic) standard deviations and so forth.

What we found was that the IEC cotton load was very repeatable. Specifically, at the 95 percent confidence interval was plus or minus 2 percent of the energy value for one of the dryers and a 95 percent confidence interval for another dryer, it was plus or minus 1 percent. So I'm happy include more about the repeatability studies in the California Investor Owned Utility CASE team's comments, because we did do those studies on the test procedure with the IEC cotton load.

Furthermore, in order to verify our test at the San Ramon Lab we conducted round robin testing on a dryer that was also tested by Underwriter's Laboratories, so well established test protocol. We tested that dryer. It was a residential dryer, under the DOE test protocol and verified that we were within the error expected for that dryer.

So furthermore, the test lab that we have is in the process -- part of the lab is ISO, IEC certified to 17025, which is the quality standard for laboratories. We are in the process of certifying to that standard.

So we have high confidence that the data that we have submitted under this test procedure is repeatable and reproducible with the IEC cotton test cloths. And that we can have both representative load, in addition to having repeatable loads, without using the DOE test cloths, which are not as representative of real world use.

MR. MESSNER: Okay. And that's -- we'll submit comments on that, but there's a reason that no one else in the galaxy is using that. So when you do round robins, and I hear you went to UL and you had two dryers, but there's a reason why there's a test cloth. And there's a reason the test cloth is very -- I mean, when we -- it goes to mark there are the batch sizes they go through to make that test cloth consistent that all manufactures can use. It's very precise and it's there for a reason.

And so from our perspectives, we get fined by CEC and DOE if a mistake or something is made. So it's not just a lab exercise for us. There's enforcement issues as well that come to it and so the tolerances have to be extremely tight on this. And that's why nobody uses these -- that's why we use the test cloth. So --

MR. NELSON: Can I just real quick? This is Ryan Nelson from the Energy Commission. And I appreciate your comments and everyone's comments discussions in the room. But I welcome evaluation of the test procedure, having the manufacturers run a test procedure and submitted their comments during this rulemaking process. I think that's very valuable information moving forward.

If there are claims of repeatability and reproducibility please tell us how and why we can improve it, or why the test procedures failed to meet those

requirements.

So I think the conversation's great in the room, but I think further study or data submitted would also support some those arguments. So I invite those comments.

MR. MESSNER: Okay. That sounds good. And then that gets to the other point of this test procedure is so expensive, you have to set up cranes in the room and move hundreds of pounds over on the scales. I mean for the larger loads, it's very, very expensive, very, very burdensome.

And then the ambient issue too. I wanted to raise that. The ambient, the tolerance was ratcheted down on the ambient temperature. And it was to 65 degrees, which is only California. So that's not going to -- California, usually if they're looking at things, they're usually under the impression that this will spread nationally. But 65 ambient is not representative nationally and the tolerance level of plus or minus 1.5 degrees is much tighter than what is seen at DOE.

MS. FOSTER PORTER: Yeah. May I respond to the second part about the tolerance, because you highlight an important difference in the U.S. Department of Energy test procedure compared to this one.

So when we did our temperature investigations, what we found is that the energy use of a dryer can differ

up to 4 percent within the range that DOE allowed, which is the 6-degree range. That if you were to test at the low end of the range and test at the high end of the range, it could be a difference of put to 4 percent in the energy use. And that was a very high error from one variable in the test procedure.

So going back to your earlier point that when you submit data, you really want to make sure that it can stand up and that you won't get penalized, we wanted to tighten that down so that that 4 percent error essentially, could be eliminated from the test procedure.

From a cost perspective to adjust that temperature range to 1.5 degrees was just a matter of adjusting and tuning the HVAC equipment more appropriately. It didn't require extra HVAC equipment above and beyond what would have been required for the DOE tolerance. So it's a relatively low labor cost to increase the error by or significantly decrease the error. So I did want to speak to that, because I think it addresses your earlier point of just being able to be repeatable.

MR. MESSNER: Yep, no it does. And it's a tough balance for all these things. That's the thing, is you have repeatability and reproducibility, cost and burden and representation. It's hard to balance.

And that's where it takes years to go through

this, where manufacturers at the table doing round robin testing and things like that or the DOE, which goes through that type of thing and that's why we would achieve the thing.

But the RMC, I wanted to point out the 2 to 4 percent RMC, that's -- I don't even know what to say on that. For these larger loads it is so sensitive to the ambient moisture. You set it out and just transferring it, it absorbs. The remaining moisture content can go up a percentage or so just in the transferring of the load.

So it's already an issue with the residential units, the smaller side, and the bigger it gets it skyrockets or exponentially it gets more problematic.

MS. FOSTER PORTER: So Kevin, we had that same concern. And so I'm not sure you had a chance to read through the section for textile handling. But we specify the vessels to be impermeable to water vapor.

You know, we had some more details in there that are kind of common sense, that a lot of labs are doing, but weren't written into the DOE test procedure before.

We also have time limits for advance work to try to address that. So we were aware of that issue with the DOE test procedure and tried to improve upon it, again with very little cost. You can put a plastic bag in a vessel and it really helps with the repeatability, just as an

example.

MR. MESSNER: Okay. Thanks. Well, each little cost ends up being a lot of cost in the end. So all these little things, it's just a little cost, each one's a little cost, but at the end of the day it's a lot more expensive. And these larger units are a lot of times built to custom. There's thousands and thousands of SKUs.

All right, going through these others quickly, so how long did you -- how long was the test? When you finally ran it, how long did the test end up being? You compared it to a clothes washer test, which I'm not sure why that's a comparison, because that's different product, but how much --

MS. FOSTER PORTER: So there's a memorandum on the docket that details the amount of hours that we expect for the test protocol. I don't have that off the top of my head in terms of the very specific that we have cited there. So I don't want to give a specific number, but I encourage you to go to the docket. There's a memorandum that summarizes how much time is needed as well as labor costs associated with the runs.

And that was posted Ryan, when?

MR. NELSON: That was posted about two months ago, I believe.

MR. MESSNER: Okay.

MS. FOSTER PORTER: Yeah, so please go there to refer for that question.

MR. MESSNER: Okay. Thank you.

MR. NELSON: And to those testing costs we did do a -- there is a short section in the draft. Whoops, I think my (indiscernible) in the draft report table.

MR. MESSNER: Oh. Okay.

MR. NELSON: Again, we're proposing testing certification and marking requirements. We are always sensitive to costs associated. However we're not proposing efficiency standards this time. That's not in the proposal. So we are sensitive to costs, but there is a short section in the draft report also relying on some of the values in that memorandum that's posted.

MR. MESSNER: Okay. Thanks, Ryan.

MR. NELSON: And a couple of more comments. We're --

MR. MESSNER: Yeah. Let me -- Yeah, I'll just try to get through these quickly. I was curious, you talked about the partial loads. One thing we had talked about before this is your testing partial loads and looking at partial loads. But then we thought from the report the study confirmed that at least maybe for the -- maybe it's OPLs only, but that nobody's putting in partial loads.

So and then so maybe if you help, thisi s one for

our written comments where we're a little perplexed or confused maybe where these test procedures -- and I think in a lot of cases maybe we're jumbling them together, but we're really talking about three separate instances. There's the residential coin ops in a laundry mat or multi-family. And then you have the OPL and then you have the larger commercials in a laundromat and each one's a little different.

But if the OPLs already have a full load, then adding a partial load for test procedure seems to overly complicate and create more burden. And for the smaller loads, it's time. You're paying for time. And those California weights and measures you have you put in however much money, you get that much time.

So the whole RNC auto-termination partial load, full load, conceptually you're talking about going to the engineers, they don't understand how it all fits together, because it doesn't relate to reality on the laundry mat and so if you could clarify that or (indiscernible) that'd be helpful.

And then at the same time, then as we look at the larger load, larger commercial stuff, which you're saying is already full load, it just doesn't -- we don't understand how this all fits together, partial load RMC, with everything else.

MS. FOSTER PORTER: So the market study that you're referring to did not -- so this is for other people's reference, TRC, as a consultant to the investor owned utilities that consulting group prepared an OPL or an on-premise laundry market study. And that is posted to the docket. The OPL load or I should say pounds per year of textiles that we use in the CASE report to talk about the energy use, comes from that report. So that's what Kevin, or I should say Mr. Messner, is referring to.

And so your questions is about you know if the OPL study assumes full load, in order to calculate the pounds of textiles per year, why are we including partial load scenario? The OPL market study that we have for TRC is they didn't ask specifically about load sizes. They assumed that all the loads were full sized. That's the best available data we have on total pounds per market in California. So that's what we used to generate the energy estimates.

For the purposes of then why do we have something sort of partial load? Well, TRC assumes full load, but what we have observed subsequently since that study was produced, in our site visits and expert interviews is that they're not all full load.

So you make a point that perhaps for the OPL portion of the market maybe those loads per pounds per year

need to be reduced slightly, per the energy calculations. But from all of our expert interviews and our own observations, partial loads happen regularly. So that's the reason why they're included in the test procedure. Hopefully that helps. It's a little bit -- if you want to talk more afterwards I'm happy to explain it further.

MR. MESSNER: Okay. No. That's helpful I think. It's just hard to -- since the partial load, you have time dry and then you have folks that are in the OPL, which have an economic incentive to put a full load into increase let's say in a hotel the number three through. And then on the time no one can control if someone puts four quarters in the coin -- wants to dry their sneakers and they're paying for the time to dry.

So it's just not making sense, but all right that's all.

MS. FOSTER PORTER: Yeah, and Mr. Messner or Kevin, I'm happy to -- you said your engineers are having trouble making sense of how do the different test runs apply to their market. If you'd like to talk further, I'll get offline and happy to do so.

MR. MESSNER: Thank you. Thank you. All right, we already got to that. I think we covered everything. Yep, so Sean? Thank you for answering the question.

MR. SOUTHARD: Yeah, this is Sean Southard.

MR. NELSON: Sean, please turn on your mic and introduce yourself.

MR. SOUTHARD: Okay. Thanks. I'm all the way from Michigan, so I want to make sure I get my word in here today.

So I'm Sean Southard. I represent Whirlpool Corporation. We're a U.S. based manufacturer. We run everything from small residential appliances, large residential appliances to commercial appliances, including commercial dryers. And within commercial dryers, we manufacture everything from multi-family, coin operated, to on-premises laundry.

So our brands are Whirlpool, Maytag, American Dryer Corporation, ADC, KitchenAid, Amana, a lot of brands that all of you guys have in your home.

So specific to dryers, we have manufacturing both in Ohio and Massachusetts. We have about 2,800 people employed making dryers. I just mentioned this, because we have a wealth of experience. We're combined the largest manufacturer of appliances, period. We combine small, major and commercial together. So we have a wealth of experience working on both test procedures and standards, with DOE, with CEC, over the past several decades.

So we appreciate things like this for CEC. You know, the whole workshop to engage stakeholders in this

matter. But frankly, we're just very disappointed to see the lack of engagement with manufacturers like us, from the CASE team and from CEC, prior to having this workshop today.

You know, I know (indiscernible) CASE report mentioned that you interviewed manufacturers several years ago. We just didn't see it this time around, where you guys reached out to us and asked us questions or if we have any data or input on this proposed test procedure. You know, it kind of runs counter to how DOE develops standards and test procedures, where it's a several year iterative process and manufacturers are engaged right from the start before even talking to anybody else.

So we would have liked to see that, but like I said thanks for engaging us now. And obviously, I also want to recognize the great amount of work that the CASE team has done to put this together. We know from experience how long it takes to develop a test procedure and do the type of analysis that you guys did. So it was I think pretty well put together. You guys thought through a lot of different things, but at the same time we still have some concerns that we want to address with you guys.

So I also want to say that we appreciate the desire from the utilities, the IOUs, as well as CEC to save energy in the commercial laundry space. And as you

mentioned, a lot of owners, operators of commercial laundries want to save energy, which is a good thing. But obviously, there's always tradeoffs involved, right? So in general, for residential appliances and I think it's true for commercial, they'll always want to save energy as long as they're not going to have to trade off on cost, or cycle time, or features, or capacity, or a number of other things.

So once you start to rank those together, efficiency starts falling down that order. So I don't think you guys have done the analysis quite yet to say that there's a demand from owners, operators and consumers for efficiency if these are the tradeoffs that they're faced with.

So our recommendation for now is that we don't think it's appropriate to propose any commercial dryer standards or test procedures at this point and time or into the future. And I'll go through a couple of reasons why I think that's the case. And obviously I'm aware that CEC isn't proposing standards now, but I'm just trying to caution you against it in the future and some things to think about.

Number one, we think there's a lack of benefits in relation to the cost of the standard. Obviously, there's a fairly low number of shipments into the

California, especially as you go up the larger on-premises laundry segment. There's minimal energy savings potential I think. I know you guys did two dryers or two units and compared the energy savings based on those, but you really can't make conclusions based on two units that you think are similar. I mean there's obviously a lot of different factors in place and to have a more robust analysis requires more than two units to be looked at.

And I think you acknowledge this, but there's EU energy saving potential technologies out there on the market today. So how are you really going to analyze known technologies that are being (indiscernible) today, but just don't exist. Where at least for residential there's some efficient technologies being used by key manufactures. Like you said, there's one heat pump for example being used today. And there's a reason why there's one heat pump being used today, right? There's a reason it's not more popular than it is. So we would like more robust analysis in the thinking on that.

And also, we have to think about our customers, both from the person that uses it from the coin op side. And they're typically a lower-income consumer, you know, that's going to be going to a coin store to use the dryer there. And as you know, most of them are timed. And as Kevin was pointing out they're paying for the minute that

they use. So you have to be cognizant of are you going to make them pay more by increasing the time. Or are they just going to have to pay more for the per minute, because the dryer now costs more for the route operator or the owner of the laundry mat. So some things to think about, especially when it comes to low-income consumers.

Also, for the on-premises laundry, multi-family and some of the larger coin op, there's distributors, route operators and the small businesses that are going to be impacted, like I said, if there's a longer drying time. There's potentially increased product costs within the technology in there and few returns available in a given day. So you have less revenue coming in for the route operator or the owner.

And to talk about OPLs, there might be lower worker productivity if you have few turns on a given day, because the cycle is now taking longer. So we think all things should be examined especially when it comes to California-specific customers. And we can obviously help put you guys in touch with some of them, if you don't have any contacts in that space.

And on the test procedures specifically, we caution you against using -- I don't think that you guys have necessarily hit those four R's quite yet. And this is kind of why I wish you would have engaged us beforehand,

because we could have helped you think about some of these things. This is the things that we think about when we develop test procedures. But I don't think that you guys have given the state of quote yet to say, "Yes, that's repeatable, reproducible, representative, and reasonable."

And especially in the reasonable portion, you guys need to probably better quantify the manufacturer burden. In terms of procuring all this new equipment that we have to have, new lab spaces, thousands of pounds of test cloth. And I noticed you didn't mention how much the test cloth costs, because it's very expensive. It's thousands of dollars for a single load, especially if you talk about a 210-pound load that's thousands and thousands of dollars just for that one load. And it's already making me wonder if you guys are kind of in it with the suppliers, that are making all this cloth, just because it costs so much. And now they have this new business, right?

And another point I wanted to mention is the on-premises business is mostly built to order, as Kevin mentioned. These are custom SKUs in most cases and there's thousands of them. Just Whirlpool alone, we have thousands of SKUs in the on-premises laundry space. So you have to balance how much of these can we feasibly test and certify for our customers without delaying product development and launches.

So I know you guys had stuff in there like testing basic models, but it's not the same in commercial dryers as it is for residential appliances where a basic model might be color variant or a different door handle. These are things that the customer is asking for specifically to be different. So it's not the same in residential as commercial, to try to get just a basic model. And you might have to test thousands of SKUs, you know?

And you have to kind of think about what's the benefit to that purchaser to having this data? They might be buying it and then -- okay, so you buy it, you manufacture it for them, and then we test it afterwards. Well, why does it help to have that data after they already bought the dryer, right? They probably would want that data ahead of time, but it's custom, you simply don't have that data available. Okay.

And we have other specific issues with the test procedure. I'm not going to go into the detail on most of these, but we'll definitely follow up with written comments on them, including the RMC as Kevin was mentioning, the scope. I'm not sure why you guys landed at 655 cubic foot, but I'd like an explanation of that.

A standby power measurement? I'm going to point out for DOE that we don't measure standby power for

commercial washers. And there's a reason for it, because commercial laundry you have to show that the product's turned on, so the customer or route operator doesn't think it's broken. So if you try to do anything to route a standby you might turn off the displays or something like that. And now you might get a service call, because they think it's not working. So I would encourage you to look at that and what DOE has done for commercial washers.

Kevin mentioned the environmental tolerances and there's a few other things, but I won't go into detail on those right now.

And then it brings up this larger point that I had that the CASE team only did a limited amount of testing in that single lab. And I think you guys mentioned you did some, one or maybe two tests at UL as well. We don't want to call seven or eight units tested at one and maybe two labs, equally reproducible and everything that you mentioned. The test procedure coloration or it's supposed to be a collaborative process, it takes a long time to get it right. And it's not just developed in a black box somewhere in California and then handed down to the manufactures. It's iterative and it doesn't take six months. It's usually several years of development. So we really don't have an appropriate amount of time by September 1st to meaningfully use this test procedure and

comment on it. So I would recommend, for now, just to abandon the proposal entirely to test and certify.

If CEC really does want to move forward with it, despite our concerns that I highlighted, I would suggest working directly with us, associations, other manufacturers and we can talk in more detail about the proposal itself. And we'll help you get a proposal that works for manufacturers as well, the ones that are actually going to use this to test and certify.

So I'm not sure what that looks like. I'll let you guys think about that. But maybe it's, like I said an iterative process, round robin type testing with manufacturers, using third-party labs. Maybe an in-person workshop once we all have some experience with it to go through these details with some of our engineers. Kevin and I aren't engineers by training, but we would love to have them here to debate specific points on this.

So that's I guess all my comments. Thanks for letting me talk.

MS. FOSTER PORTER: This is Suzanne Foster Porter. Can I ask you one clarifying question, just one clarifying question about your comment? You mentioned remaining moisture content as one of your concerns, but neither of you elaborated on that. Could you please -- would you mind elaborating just a bit on your concern with

that, just for clarification?

MR. MESSNER: So there are two maybe higher arching concerns. One is that the auto termination concept doesn't even -- I can't even get my head around it, to even fit in a laundry mat situation or when you're paying for time. So that it just doesn't even make sense. And so that's one. And then other is that the ambient moisture gets into to loads, which you already talked about that, creates significant problems when you have a 2 percent or even 4 percent RMC to hit that, pull the load out with cranes or whatever.

And no one here is going to -- maybe you guys are strong, but 200 pound loads or whatever, people aren't lifting those up with their hands and with their backs. You have to have cranes or something to lift loads around. And by moving those loads around, as soon as they're out of the dryer, the ambient moisture collects in that RMC. You could have a bone-dry load and in a few minutes it could be 2 percent RMC. That's how quick it changes. And so it could depend on what's going on.

So those are two high-level concerns that doesn't match with the low stuff and it's hugely sensitive and to the ambient moisture content with the larger products.

MR. SOUTHARD: And then just one other concern, Sean again from Whirlpool. Generally, how did you arrive

at those RMC targets? Per DOE for D2 dependencies in test procedures, there is a lot of work with manufacturers to figure out what consumers believe to be a reasonable RMC that they would determine to be dry. It seems like your guys's targets were more arbitrarily chosen. I didn't see the research that went into -- we believe that all the way from coin op multi-family on premises this is a reasonable RMC target, where consumers and users believe that the cloths are dry.

I mean there's reason to believe that in a lot of those cases, they want them to be very dry at the end. It's not like you're at home where you can just hang them up at the end and let them get that other couple of RMC out of the clothes. Especially for like a hotel. You want those towels to be bone dry when they come out at the end. You might not want them at 5 percent RMC or at 4 percent RMC, because they're going to smell like mildew once you fold them and leave them somewhere in a closet.

So I think you guys probably need to talk to us, interview other users, owners of these to figure out what those appropriate RMCs targets are. And it just seems like it was more arbitrarily chosen at this point.

MR. NELSON: Thank you, Sean and Kevin. And again, I appreciate the comments. By all means, contact me if you have any questions regarding dryers. If you have --

I appreciate your statements. If you have data to support your comments today, I highly suggest you submit that data. All that data is very valuable in our rulemaking process.

Our process is slightly different than the DOE's process. We just had a presentation on Tuesday on that. I'm sorry, Kristen you're raising your hand. And that presentation is available on the Web. If you contact me, I can put you -- just to clarify some of the differences of how this process will move forward. And I encourage reaching out to other groups in the room to work collaboratively to work together and help each other out in this process. So I appreciate all your comments today.

Kristen?

MS. DRISKELL: Hi, this is Kristen Driskell from the Efficiency Division. I just wanted to clarify or correct something for the record, which is that we didn't just start this rulemaking. We started it back in 2013. We had an invitation to participate with Whirlpool and AHAM who participated in that process. They participated in the invitation to submit proposals.

It's been a long time for this rulemaking and I know it went silent for a while. So we really do appreciate the feedback that we're getting now, especially since this is within the last six months, the first time we've seen this proposed test procedure. So it's important

to get that feedback, so we really appreciate that.

MR. SOUTHARD: Thank you. This is Sean again. So like you said, it was started several years ago and there were opportunity for stakeholders to submit comments. But from our perspective, it went away in like 2013 and we had nothing for four years until maybe like 2016.

So for us, it seemed like it just kind of went away and all of a sudden, now we have a proposed test procedure, which was developed outside of our knowledge. So like I said, test procedures are a very long process to develop and they're usually open and very collaborative. Like I said, I'd recommend looking at what the ANSI process is, the DOE process developing test procedures. It's not just a consultant or one agency just developing it on their own. So thanks again.

MR. NELSON: Are there any other comments in the room? I think I have one hand raised online and then we'll -- Carlos?

MR. BAEZ: Online we have a hand raised from Mike Nelson. Did you have a comment, Mike?

MR. MIKE NELSON: I do. Can you hear me okay?

MR. BAEZ: Yeah. We can hear you.

(Audio cuts in and out.)

MR. MIKE NELSON: Okay very good. Thank you for the opportunity to speak here. Two comments real quick, we

are from Dexter Laundry. We are a commercial and hotel laundry manufacturers only we don't do household. So unfortunately, Kevin and Sean can and can't represent me, but some similar comments and I won't (indiscernible) I'll just add those to my notes.

But my two comments I do want to talk about is cost. Being a non-household producer, we really don't have facilities like the household manufacturers do for doing testing. I've seen the Whirlpool. I've seen Alliances test facilities for doing DOE and AHAM and I worked for you all for a while. I've seen UL facilities that do the testing. But we don't have that type of infrastructure.

So to do very large dryer, the air conditioned, humidity-controlled room would be a huge investment for us. In fact the equipment, I would like to buy new gas meters, power supplies, power regulators, but the room would just be a terrible expense for us for doing that.

And on top of that, I'm going to have to probably contract this work out. And your labor estimates that were posted back in June by Ryan, I think probably look like the effort needed to do the test, but it's probably missing some stuff. It's missing the markup. And OEM's going to charge -- you know they've got to make a profit margin on doing this testing. They've got project management. They've got formal reporting. They've got to ship this

stuff back to us. So you're $600 to $1,000 test for labor is actually going to be about $3,000 to $5,000 per unit charge for me to test per model.

And then we have comments around the standards. Obviously you're proposing testing and listing, because I think in the future you want to set some minimum guidelines. And based on the machines that were tested, you're going to set some standard. And ultimately there's going to be testers out there that may need some help, that's going to have to make changes to their machines.

And like just the product testing costs, the actual products, I'm going to have to pass those costs on to the distributers and ultimately the end users that buy the equipment. And unless they're saving significant amounts of money on energy, they're going to have to add that to the VIN price. Or if it's time, they're going to have to add people or work overtime in the OPL situations to finish the same amount of loads.

Again, I appreciate the opportunity and thank you again.

MR. RYAN NELSON: Thank you for joining us and thank you for the comment. If you have data on what you think the tests would cost, as compared to what has been proposed, I invite you to submit those to the docket. That would be very valuable information also.

MR. SOUTHARD: (Indiscernible).

MR. MIKE NELSON: (Indiscernible) No, go ahead.

MR. SOUTHARD: Sorry, I was just going to make a point. You know, it's hard for us to give you these costs without actually purchasing the equipment and conducting the test procedure. So like I said, it just goes back to my main point about we need more time if you're really going to move forward with this to help flush out some of those costs and figure out what the exact manufacturer burden is. Just the one estimate that came already, as Mike was saying, probably doesn't reflect the reality for us when it comes down to actually performing the test procedure.

Sorry to interrupt you Mike.

MR. NELSON: That's okay. We're having --

MR. MIKE NELSON: Go ahead, Mike.

MR. RYAN NELSON: Yeah. It's just that I'm not going to do a quote to do a facility, because that's unreasonable for me to think I would spend that type of money. So I will get some competitive bids to do this test procedure from some NRTLs.

MR. MIKE NELSON: Thanks, Mike.

Yes, in the room?

MS. ANDERSON: So this is Mary Anderson, from PG&E. I recognize it would have been lovely if we could

have reached out. I reached out at least to a few of you through a friend of yours, Pat Kilroy. And I believe we are planning on having meetings soon to address this and a few other opportunities. I think we were told maybe October would work. We are happy to move at a quicker pace than that, if that be helpful.

MR. MESSNER: Yeah, I think what the -- yes. I mean, we're happy to talk through this. But I think what Sean's trying to get at, is that we realize these rulemakings, we have the history of what's been going on for years and that's all fine. But what the frustration is I think that you're hearing is that this test procedure -- and is mentioned I think in your presentation or somewhere that this was done in conducting and included manufacturers. I don't know what manufacturer, appliance manufacturer or say an AHAM member that you actually talked to. You said you said you talked to someone, but maybe it wasn't Whirlpool and it wasn't some others that I've talked to.

So by going to in this test procedure -- it's better done in an open collaborative process, in an ANSI driven process instead of PG&E and your consultants. I'm just being frank, going in and dropping this test procedure on and making up your own new test procedure when there's already a DOE one out there that, which I know that's what

started in the first time. But then you go from DOE, which has some issues and then come up with an entirely new one, way off. I mean if you just leap from one to the other and PG&E, you guys are utilities. We're manufacturers. We deal with the tests.

And so that's the frustration that you're hearing. And so now you come up and now we're stuck with yes, we have a lot of criticisms over it, because it doesn't make any sense. Because it was done by utilities and no manufacturers were in the room. And so by ANSI process, it doesn't mean that we'd do the test procedures. That's included in NRDC and that's what's in every PG&E and every one and works to see coin operators all. You get a balanced standards committee and work through this stuff.

And it is hard. Test procedures are a pain. And they're very difficult for us and for everyone. And we, AHAM has its own test procedures. And we have a home laundry test procedure, which is cleanability and we -- we continually say we need to change that as well. And so it's tough. And but they're the backbone of everything that then drives from that. If you get those wrong then everything else is flubbed up.

And so we need to get this right. And it has to be done open. And I don't know the best way to do it, whether it's through maybe CEC or workshop or whether some

ANSI or a standard setting body or what. I don't know this. I don't have any -- but that's what we're after. I mean just you talking to us and then going and doing shuttle diplomacy, I'm not sure how well that works either necessarily. It's good to get everybody in the room and it takes a lot of meetings where we get engineers in there.

So that's kind of what you're hearing our frustrations with, and maybe not the most -- maybe our tone. I mean, we're trying to -- it's just we're frustrated, so that's what you're hearing. So that's where we are at, but yes we'll be happy to meet as soon you can.

MS. ANDERSON: We are happy to meet with you and work in a way that works well. So the one thing to note, PG&E is working on this through our EE program. The parties that we are looking to make -- we have to work with them the processes we're given, but absolutely we look forward to working with manufacturers and industry groups.

MR. NELSON: Thank you, everyone. Are there any other comments? If not, we're going to take a short break and come back at the top of the hour. Is that enough time for everyone? Ten minutes. We'll come back, let's just call it, 3:05. We'll come back at 3:05 and you get 15 minutes.

All right, thank you everyone.

(Off the record at 2:53 p.m.)

(On the record at 3:07 p.m.)

MR. SAXTON: Can I get started again? This is Pat Saxton. I'm an Engineer in the Appliances and Outreach in Education Office in the Efficiency Division. And I'll be presenting on the draft air filter testing certification and marking requirements.

We'll cover today's purpose, a quick background, proposed changes to the existing regulations, have an opportunity for public comments, and then talk about next steps.

We're a little different, because this topic has been presented multiple times. We have existing regulations. So rather than present any new concepts, we're just going to review proposed modifications to the existing regulations.

As background, in case someone is new to the issue, the building efficiency standards that required the installation of air filters that were labeled for filter efficiency and static pressure drop beginning July 1, 2014.

And the appliance efficiency regulations required residential air filters sold in California, to be certified and marked with the same information for filter efficiency and static pressure drop, beginning July 1, 2016. This compliance date was subsequently delayed to April 1st, 2019 through emergency regulations that were adopted by the

Commission earlier this spring. Next week, at its August 9th business meeting the Energy Commission will consider making permanent that delay in compliance date.

Just for a quick refresher, the product types that are currently covered by the existing regulations, the types of filters that we see in residential mechanical systems, they could be fiberglass, pleated paper, electronic, I'm not showing adjustable size air filters, but those are in the current scope.

So jumping right to that regulatory language we are proposing modifications to the scope, because we typically want product coverage requirement to be done in the definitions rather than the scope. So we're eliminating the language in the scope for this topic, except just leaving air filters. And then we'll make changes in the definitions.

The goal for the definition changes and really the products that get covered, because of those definition changes, are to better align with the scope that's in the Title 24 Building Efficiency Standards. And just roughly paraphrasing that, it's residential mechanical systems, supplying air through duct work that exceeds ten feet in length.

So the change that we're proposing for Title 20 is to eliminate that phrase, "Installed in forced air

heating or cooling equipment" and then add phrasing that says, "Designed for installation in residential ducted forced air heating or cooling systems," adding a sentence that says, "Air filter does not include models that allow the consumer to adjust the dimensions of the end use device."

This does three things. It limits the coverage of air filters to be those designed for installation in ducted systems. It removes from coverage air filters that have a filter face area that's adjustable by the consumer. And it leaves electronic air filters within product coverage.

We're also proposing to add a new definition. This would be for the basic model of an air filter. The proposed definition is all units of a given type of an air filter, with the same depth and the same construction, including type and grade of air filter media, pleat spacing, pleat height, pleat support, and filter frame pattern. The basic model of an air filter includes air filters with different filter face areas. The reason for adding this definition, which could be roughly considered a definition for a product family, the reason for doing that is it facilitates reducing the number of products that must be tested.

In Section 1604 test methods we're proposing to

update to the current version of the test methods currently cited. Those are ASHRAE 52.2 and AHRI Standard 680. (

More importantly, we're proposing modifications that do reduce the number of products that must be tested. And we're trying to increase the specificity and the particular product that's selected for testing. So we're striking the small, medium and large-size filter language in the existing regulations and proposing that manufacturers shall test each basic model of air filter. And that the tested filters shall be the one with the dimensions closest to 24 inches wide by 24 inches long. We do want to make clear that manufacturers may test additional air filters of other dimensions if they chose to do so.

In Section 1606 filing by manufacturers, we often call this certification. Just as a reminder tested models of air filters must be certified. Under this proposal, that would be at a minimum of each basic model. And then we want to be clear that models that haven't been tested, in our case that'll be models that have calculated data, that they cannot be certified.

The Section 1606 data submittal fields, we're proposing some very modifications. We're removing the field air filter sizes tested, because we've eliminated small, medium and large, so that's no longer relevant. We

proposed to add the model number of the tested air filter and then we're making minor changes to the allowable values for MERV. We're eliminating 17 through 20, because those are no longer referenced by the test method. And actually not applicable for filters tested for ANSI/AHRI 680 is, we're just maintaining that. It is in the current standard.

For the marking of the air filters, we're splitting those requirements into three subsections. One for filters that have been tested for ANSI/AHRI Standard 680; two, filters that have been tested for ASHRAE 52.2. And then three, the filters that have not been tested and will have calculated information.

For those first two types this would be filters that have actually been tested, first two categories, excuse me, filters that have actually been tested. We're not proposing any substantive changes. If you look at the staff report you'll see a couple of minor edits that are just wording and verbiage, but no change of intended effect.

However for filters that have not been tested, this is the new information that's being proposed and covered in the staff report. And the goal is to mark a filter that has not been tested with information based on that from an air filter of the same basic model or same

product family, which has been tested. And to derive or calculate that information will rely on the relationship of that volumetric flow rate equals the face velocity multiplied by the face area.

When comparing untested filters versus the tested filters, we're proposing to make the assumption holding the face velocity equal, so that it simplifies some of the calculations for the filter that hasn't been tested.

Specifically, the information that an air filter has to be marked with, for a filter that has not been tested, both the particle size efficiency or PSE and the initial resistance for the untested filter would be identical to that of the tested filter. So this is because of one, the way we've defined the basic model and two, because of this assumption that will hold the face velocity to be equivalent.

Another thing, the calculations that actually need to be completed are only for air flow rates. So to determine the air flow rate for the untested filter we're proposing to use the equation that the volumetric flow rate of that untested filter is equal to the volumetric flow rate of the tested filter, multiplied by the face area of the untested filter and divided by the face area of the tested filter. We've got a backup slide of how we came up with this equation if anyone is interested in following up

on that.

And then for air filters that were tested under ASHRAE 52.2, then they're required to mark a value for MERV, it would also be identical to that of the tested filter.

One item in Section 1607 is that the Energy Commission provides a sample of what the marking on an air filter might look like. We are not proposing any changes to that and it is only a sample. It is not required to manufacturers to follow that, but we did want to point out that there was a small omission. And that's that asterisk that should go along with air flow rate value 5, which is to indicate that that is the maximum rated air flow for the filter.

So that is really the end of my presentation. We'd like to take any comments of feedback at this time. Yes, in the room?

MR. STEUBEN: Good afternoon, everyone. This is Jeff Steuben. I'm with Energy Solutions, representing on behalf of the Investor Owned Utilities. Good afternoon to everyone who's still here and still awake.

I just have a really general comment on this topic, to say that the IOUs support the changes that have been made to the procedure. We think that the testing requirements are more clear and we think that that is a

good thing and that will help encourage industry participation and adoption of this practice.

MR. SAXTON: Thanks, Jeff.

Carlos, do we have any comments online?

MR. BAEZ: (Indiscernible)

MR. SAXTON: Yeah, just so everyone's unmuted now let's go ahead and -- Laura, do you want to go ahead?

MS. PETRILLO-GROH: Sure. This is Laura Patrillo-Groh for the Air Conditioning, Heating and Refrigeration Institute. I just wanted to thank the Commission, and especially Pat for the excellent dialogue and communication during this process to address air filter labeling. We appreciate your attention to detail on aligning Title 20 with Title 24.

And I had previously mentioned in an email to you, just that CEC really has evolved on the issue of scaling the tested filter. So has industry thinking as well, regarding that procedure in AHRI 680. And I can fully express this more in comments. I'm hoping that it would be acceptable to conduct the testing at the max rated air flow and scale down based on that to 25, 50 and 75 percent of that 100 percent rated air flow. And that will get us to a good point of a scale test to the scale test numbers from the packaged filters numbers.

MS. SAXTON: Okay. Thanks, Laura. Yeah, that

will help if you add that to your written comments. We appreciate that.

MS. PETRILLO-GROH: Absolutely. Thanks, Pat.

MR. SAXTON: And Peter, did you want to make a comment?

MR. MCKINNEY: Yes, I do. This is Peter McKinney with StrionAir, Incorporated. I also really appreciate the work that's been done here. It's been a lot of good work on tightening up these regulations.

One question regarding electronic air cleaners and particularly electric enhanced air cleaners that have a removable filter element, I'm wondering if the marking on filters should be the same. The filters are generally designed for use only within the electronic air (indiscernible) and only meet their efficiency when used with that electronic air cleaner. So it could be misleading to the consumers if the filter is simply marked like other filters for use outside an electronic air cleaner.

Showing (indiscernible) particularly a little asterisk below the table that says, "Only when used in the air cleaner for which it is designed," or is it maybe something called out specifically in the regulations? You may not have the answer now, but I wanted to make sure that at some point that that could be thought about an answered.

MR. SAXTON: Great. Thanks. And if you can put that in a written comment Peter that would be very helpful. I don't have an answer right at the moment. But in general, if a manufacturer chose to add an additional explanatory information to the marking, that that should generally be okay.

MR. MCKINNEY: Great. Thank you very much. I will certainly put it in writing for you.

MR. SAXTON: Was there anyone else online who wanted to make a comment?

MR. O'DONNELL: Patrick, this is Dan O'Donnell with Honeywell. How are you?

MR. SAXTON: Hi, Dan. Good. Thanks. How are you?

MR. O'DONNELL: Very well. One quick question and I don't expect you to have an answer, but (indecipherable) extension might be helpful.

I believe this regulation is intended to be really geared towards consumers that will be purchasing filters at retail. Is that correct?

MR. SAXTON: Yes.

MR. O'DONNELL: When we talk about the labeling on the filter itself and on the packaging or being able to see the information through the packaging, that all sounds like it's geared towards the consumer purchase at retail.

And my question is therefore, what about wholesale packaging? Is the requirement the same if we were to sell or produce packaging or bulk packs for contractors?

MR. PAXTON: So yeah, Dan, I don't have an answer offhand for you. But I would agree that generally intent here is to provide the consumer with information, but the appliance efficiency regulations are applicable to all products sold or offered for sale in California, regardless of if that is for distribution or at retail. The one exception would be when they're sold for distribution that's explicitly out of state. So if you could put that comment in writing, that would be very helpful, Dan.

MR. O'DONNELL: Okay. Thank you much.

MR. SAXTON: Did anyone else online have a comment? Kristen has a comment in the room.

MS. DRISKELL: No, I just wanted to follow up (indiscernible) primarily consumer facing, but it's also geared towards contractors who are installing air filters in new construction. It's a requirement under Title 24 that the air filters in new construction have these labeling requirements in residential buildings. So that's the other intended audience for this label.

MR. SAXTON: Thank you. That is an important addition.

Okay. I don't think we have any more comments.

Just as a reminder where we are in this process and our next steps, we've published a draft staff report in July with a 45-day comment period. Any comments that the Commission receives will be reviewed and analyzed, potentially leading to modifications in that draft analysis, which would then be published as a new staff report.

Written comments are appreciated. There's a couple of ways that that can be done. They're due September 1st at 5:00 p.m. Probably the simplest way to do it is through the Commission's e-commenting system. The link here is a direct link to that comment form, for Docket 17-AAER-01. Comments can also be emailed to docket@energy.ca.gov or hard copies can be sent to the address at the bottom of the slide.

And finally, my contact information for anyone who doesn't have it is showing on the screen now. And thank you for your time and participation.

(Whereupon, at 3:26 p.m., the workshop was adjourned)

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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.

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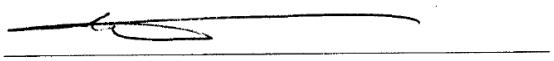

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