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Filer:	Bruce Helft
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CALIFORNIA ENERGY COMMISSION
REMOTE STAFF WORKSHOP

IN THE MATTER OF:	) Docket No. 20-FDAS-01
	)
	)
Public Workshop for Flexible Demand Appliance Standards for Pool Controls Draft Staff Report and Proposed Regulatory Language	) REMOTE WORKSHOP) Re: Flexible Demand Appliance Standards for Pool Controls Draft Staff Report and Proposed Regulatory Language

STAFF WORKSHOP FOR
FLEXIBLE DEMAND APPLIANCE STANDARDS
FOR POOL CONTROLS

REMOTE ACCESS ONLY

JULY 19, 2022
9:00 A.M - 1:00 P.M.

Reported By:
E. Hicks

APPEARANCES

CEC Commissioners:

Andrew McAllister, Commissioner CEC

CEC Staff: (Via Remote)

Michael Sokol, Director of the Efficiency Division, CEC
Nicholaus Struven, Program Lead, CEC
Bruce Helft, Moderator CEC
Ho Hwang, Electrical Engineer CEC
Livinus Ishaya, CEC

Presenters

Michael Sokol, Director of the Efficiency Division, CEC
Andrew McAllister, Commissioner and Lead, CEC
Nicholaus Struven, Program Lead
Daniel Buch, Branch Manager, CPUC
Bruce Helft, Moderator, CEC
Ho Hwang, Electrical Engineer CEC

Panel Members:

Panel: Respondents' Panel Discussion
Moderator: Bruce Helft, CEC

Pierre Delforge, National Resources Defence Council, Inc., NRDC
Jennifer Hatfield, Pool and Hot Tub Alliance, PHTA
Mary Anderson, Pacific Gas & Electric Company, PG&E
Henry Richardson, WattTime

Public Comment:

Bruce Nordman, Lawrence Berkeley National Laboratory
Geoff Wickes, NEEA Emerging Technology
Jorge Gamboa, Self
Tristan de Frondeville, SkyCentrics
Angela Chuang, EPRI
Philip Escobedo, Fluidra

I N D E X

P R O C E E D I N G S

JULY 19, 2022 9:01 a.m.

(On the record at 9:01 a.m.)

MR. SOKOL: All right, good morning, everyone. It's just a minute past the hour and 9:00 o'clock here. We'll go ahead and get started. Welcome to the Flexible Demand Appliance Standards Workshop, a staff workshop on pool controls. I'm Michael Sokol, the Deputy Director with the Efficiency Division. And I'll give some quick introductory housekeeping comments before turning over to Commissioner McAllister for some introductory remarks. Next slide, please.

Here's a brief overview of the agenda for today. I'll give a brief welcome, followed by introductory remarks from Commissioner McAllister. And then, a brief presentation framing the Flexible Demand Appliance Standards before a good presentation and discussion on the poor controls staff report that was recently published.

And then we'll hear from the Project Lead, Nich Struven, who's going to provide an overview of the report and the proposed regulatory language.

Also, we have a representative from the California Public Utilities Commission, whose staff we've worked closely with in developing the proposed standard and the staff report: Daniel Buch, the Program Manager for

Electric Rates, Customer Generation and Demand Response at the Energy Division of the California Public Utilities Commission.

And then we'll have a facilitated discussion by Bruce Helft of the Flexible Demand Team, and then we'll follow that up with an open public comment period where attendees will be able to make comments and ask questions.

We also -- a reminder we would like to encourage written comments, which are due August 31, by 5:00 o'clock p.m.

Next up are two brief housekeeping slides. First, this workshop is held remotely without a physical room location for participants. We are using the Zoom platform with remote participation instructions provided in the Notice. And we've included a link here for convenience.

Also for any technical issues or questions about participation the CEC's Public Advisor Office can facilitate your participation and they're available at the email and phone number you see included here. Next slide.

Before we get jump into the agenda items, we need to cover a few housekeeping rules first. First, this is a public hearing, and it is being recorded by a court reporter. All statements communicated today become part of the public record. All attendees will be muted during the

presentations. If you have questions during the presentations, you may type them into the Question & Answer function on Zoom and they will be forwarded to the moderator.

Near the end of the workshop there will be a 60-minute, or more if we need time, period for question and answer session where we will take questions and public comments. And if you're on the phone, raise your hand to speak by pushing *9 and the host will give you the ability to speak during the public Q&A session. When it's your turn you can push *6 to mute and unmute.

And a reminder to please state your name and affiliation when speaking. Next slide.

So at this point, next up, we have Commissioner McAllister, the Lead Commissioner from the California Energy Commission, to provide some introductory remarks. Commissioner?

COMMISSIONER MCALLISTER: Great. Mike, thank you very much. I appreciate your being the maestro over us here today and the host. And I want to really just thank you and staff. And in particular Nich Struven, Todd Ferris, Pierre duVair, that have kind of now retired just recently, but actually were an instrumental part of getting this report done and leading different pieces of it in the Appliances Office, so want to thank them as well. And

Bruce, of course, who will be helping out today as well. So a big team behind all of all of you, but I want to just thank the staff broadly.

This, I think, is -- I feel that this is a momentous day, really. I think if we step back, and we sort of take stock of what this first staff report under the Flexible Demand Appliance Standards authority means, it's huge. And we are trying to develop load flexibility as a legitimate aggregable, quantifiable, predictable resource for the State of California to support our clean energy transition.

Why are we doing that? Well, we know that renewables are inherently intermittent, and demand has to change and shift, and be able to modulate according to the resources that are on the grid and their carbon content. As well as reliability issues, such as an N minus 1 or you know, peak summer load, those sorts of things. A particular load pocket that's having distribution system issues, load flexibility is going to help us minimize the cost of dealing with those sorts of fairly rare, you know, honestly fairly rare issues. Obviously, climate change is accelerating a lot of those. But still, it's a few hours, not that many hours of the year we're talking about. And rather than driving massive infrastructure investments, we can use load flexibility to avoid -- to at least manage

those costs. And that's going to be good for ratepayers over the long haul.

It also helps us decarbonize when we can flex towards energy that is low carbon. And away from that, that has a higher carbon content, like in the evening peak where we've got gas fired power plants coming on, the load flexibility can help us manage those carbon emissions. And so you know, decarbonization and cost management and fundamentally over the long term, load flexibility is a reliability resource. And so even when the carbon of the grid is very low, even when it's carbon free, in 2035, '45, and beyond, we will need load flexibility to manage, to support reliability. Even when it's no longer fundamentally a decarbonization resource. So we are developing load flexibility for the long term.

The Flexible Demand Appliance Standards is one key piece of that, I think it's now -- I'd say we used to have a tripartite of authorities around the Energy Commission in terms of our standards making, sort of efficiency-related standards making: the Building Standards, the Appliance Efficiency Standards, and Load Management Standards, which I'll talk about in just a second. But this is really a fourth authority, relative to end use standards, this Flexible Demand Appliance Standards.

And so the sum total of all of those regulatory authorities is something that makes California unique, and really puts us in a leadership position. There isn't another state that has that level of kind of authorization from the Legislature to do the things that need to be done to manage the grid in the clean energy transition.

So this first report is really momentous, because it is laying a foundation for a number of appliances going forward. And so I think I would ask all of the attendees to -- you know, all the stakeholders, all of those who are listening today, thank you very much for being here. And ask all of you to look at this report, through that lens of not only is it about pool pump controls, but it's also about laying the foundation for future appliance categories that we are going to be considering flexibility standards for.

And so as you look at the report, many of you have already read it, but as you look at it, you'll see that not all of the categories of potential sort of requirements under these regulations for this specific device category are utilized fully. But we're kind of laying a foundation, staff in this report is laying the foundation for future appliance categories to say we will be considering these routinely for the devices that come up for future consideration. And so I think it's really

important that people look at it in that way through that lens.

Just stepping back a little bit further, we also have these days the Load Management Standards, the first update of Load Management Standards in a long time and quite a unique update. It's not an incremental improvement, or an incremental change to existing Load Management Standards. It's actually kind of a new approach to Load Management Standards. And it's really trying to create the conditions by which we can -- we will have massive automation at the device level. And facilitated aggregation of those devices to do the kinds of things that our Flexible Demand Appliance Standards will enable.

So when you have automated rates on a database on the web, you'll have access to those by third parties, by larger customers, potentially, by individuals potentially, but certainly by third parties that are providing aggregation services and managing a multitude of devices at the customer premise. And so those automatic rates will be automatically sort of transparent to those devices. And based on whatever the customer chooses they will be flexible, they will be manageable, they will be grid interactive. And so all that can be automated at low cost, kind of behind the curtain.

So when we have millions of flexible demand

appliances out there, and an automated platform or a platform, a digital web based, cloud-based platform to enable that automation, we're really talking a game changer there in terms of the ecosystem that will exist. That that today does not exist.

So there are other efforts that we're making in load flexibility in terms of sort of helping this ecosystem develop. The CalFlexHub is a research and development initiative that the California Energy Commission has funded with EPIC funds, that's being led by Berkeley Lab. That will help sort of put meat on the bones here to develop sort of business models and approaches that are going to allow this to happen in the real world in a grounded way.

We also have our Building Standards, really our Building Standards and the joint appendices of those Building Standards that are increasingly going to emphasize load flexibility.

So the sum total of all of this is that load flexibility, grid interactivity, native pervasive load flexibility is a core part of California's electric grid future. And so this report, I think, needs to be seen in that context. This proposal for flexible pool controls is really, I think, a harbinger of many things to come. And so I wanted to kind of set that context before today's workshop.

And really as I wrap up, I want to just commend staff on a job very well done. I think as all of you look at this report, you'll see that it is I'd say, excellent. And, you know, it took some learning on staff. This is something new. We're creating something more or less out of whole cloth. And so the staff really took that to heart and developed new skills, new knowledge, aggregated and went out there and just did the work. Rolled up their sleeves and did the work to understand what was necessary. And so we've developed some new skills on staff that are going to, I think,
serve us in good stead going forward with new devices, new appliance categories for load flexibility, as well as all the other arenas that I mentioned.

So it's not perfect. That's exactly why we have these workshops. We really need all of your input, all the stakeholders. You know, this is a key moment, I think, to make sure that the groundwork for this long term that I'm talking about, that we're aiming towards in California, is done as well as possible. That we can get this in consensus. You know, the more standardized and broad based this approach is, the more we can all agree, and industry can sort of standardize, the better it's going to be for California. And I think as goes California, goes the rest of the country. And so we're doing something really

important here.

And so I think it's not a -- it shouldn't be lost on us that this is an occasion worth celebrating. And also a challenge that we have undertaken. And I think we're going to succeed and with all of your help, I know we will.

So I want to just kick off the day with those comments, incredibly supportive of the staff here. Gratified with the work they've done, and really thankful for all the attendees today. And looking forward to all of your comments.

Well, thanks very much. And I'll pass the mic back to Mike.

MR. SOKOL: Thank you, Commissioner.

So with that, I'd like to take a few moments to frame our progress to date, and where we are currently with the CEC's overall flexible demand efforts. Next slide.

So going back to Senate Bill 49 in 2019, passed by the California Legislature, gives the CEC authority and a directive to pursue Flexible Demand Appliance Standards that meet a number of criteria, in consultation with Load Serving Entities and the California Public Utilities Commission. So implementing these standards are a critical piece in realizing load flexibility as an important resource to support the CEC's efforts to lead the state to 100 percent clean energy in the coming years. Commissioner

covered some of that, of course, and I'll provide some additional detail in support of the load flexibility ecosystem that California is developing.

But Senate Bill 49 back in 2019, directed the Energy Commission to establish standards that facilitate deployment of flexible demand technologies for appliances. This was a new authority under the Warren-Alquist Act, with new regulations that will be placed in a separate section of Title 20, to differentiate from the efficiency regulatory authority for appliances that we have been utilizing for some time.

The standards must show that they're cost effective, and will enable appliance operations to be scheduled, or curtailed to reduce emissions of GHGs associated with energy generation, all while requiring the consent of consumers.

The standards shall meet cybersecurity protocols, communications have to be open source, and interoperable and user friendly. A very consumer-oriented approach to make sure that there's benefits for consumers, for the environment, and for the electricity grid.

It's anticipated that this rulemaking will implement directives of SB 49 to establish standards for appliances that facilitate deployment of flexible demand technologies and introduce a framework for enforcement to

achieve the objectives consistent with state GHG reduction policies and mandates.

And of course, beyond the mandate staff has been working extensively with stakeholders including the California Independent System Operator, California Public Utilities Commission, the California Air Resources Board, the US Department of Energy, other organizations that are focused on this topic. And a lot of research for existing voluntary standards or even just ideas that exist nationally, in other states, and even internationally to inform the work here.

And just to piggyback on what Commissioner McAllister said, a lot of kudos deserved to the staff for doing a lot of research and a lot of analysis on this stuff, and really building out the skill set and building the muscle in this area.

And thank you to the stakeholders who have provided input along the way through public comment periods, and informal discussions. It really has taken a lot to inform this initial staff proposal for pool controls. Next slide.

So as mentioned, Flexible Demand Appliance Standards really support a number of the state policy objectives. And as Senator Nancy Skinner said, the author of SB 49, "SB 49 will help bring California's electrical

grid into the 21st century and allow us to use our clean, renewable power more effectively. SB 49 will also save ratepayers money, because smart appliances can be programmed to use electricity when it is cheapest." And SB 49, Flexible Demand, Appliance Standards are really just a tool that will help us get us there.

What we see is SB 49 is at the intersection of a win for climate, reducing GHG emissions, while also a win for consumers saving money on utility bills. Importantly, there's also a number of other benefit streams of Flexible Demand Appliance Standards, and Commissioner underscored the reliability benefits over the long term. So staff has intentionally developed the proposal for pool controls with these benefit streams in mind. Next slide.

Here's just a brief snapshot of a very, somewhat complex slide, but it illustrates the flexible demand ecosystem that's being built out here in California. Where the Efficiency Division is pursuing Load Management Standards for utilities and Community Choice aggregators. That will provide rate time dependent rate information to a central database we refer to as MIDAS, along with greenhouse gas emission signals, and emergency flexibility signals, all made available through MIDAS or a database in a machine readable format. And then made available to automation service providers and different indices in the

market to allow for shifting of load.

Since marginal GHG emissions are highly correlated with real time electricity prices and grid congestion, GHG emissions are also a reasonable signal option for introducing customers to load flexibility programs.

There's a lot more information about the different aspects of this ecosystem available on the CEC's website through the Load Management Standards proceeding, which is an active and ongoing proceeding. And also through the research opportunities that Commissioner McAllister touched upon with the CalFlexHub. You will also in addition, hear more about the CPUC's interface with the flexible demand ecosystem in California as well. And lots more to come in this space. Next slide.

So quickly, pool controls at a glance here. Today's workshop is focused exclusively on one device, which is pool controls. Back in September of last year, CEC staff conducted a request for information, and a workshop where we proposed implementing flexible demand standards in three phases. And at that time, Phase One included four appliance types, which included pool controls, dishwashers, electric clothes dryers and thermostats. Staff has been working diligently since that time meeting with stakeholders and manufacturers,

researching technical feasibility and cost effectiveness, and a better understanding of the unique issues for each of these appliance categories.

To identify flexible demand functionality for those four initial appliances scoped under Phase One, and based on that preliminary assessment, we have identified pool controls at the as the immediate candidate to move forward with proposed regulatory language and the draft staff report that was published a couple of weeks ago. At this time, we will not be further pursuing dishwashers or clothes dryers based on the preliminary analysis, but do reserve the right and may revisit those as we learn more information, and as technologies and markets evolve. There's certainly a lot more work to be done and work is ongoing to assess the other technologies you see identified here. But today's workshop and staff report and proposal is focused on pool controls.

Staff analysis indicates that the proposed Flexible Demand Appliance Standards for pool controls are both cost effective and technically feasible. Other appliances will follow soon. And the list that you see here is not exhaustive. The work is ongoing to assess the broader list of potential technologies. We'll continue to evaluate new technologies and opportunities, but today the rest of the discussion will focus on flexible demand

standards for pool controls. Next slide.

So with that, I will turn it over to our Flexible Demand Technical Lead Nich Struven. And he's going to provide more of a detailed deep dive into the draft staff report and the proposed regulatory language for pool controls.

Welcome, Nich.

MR. STRUVEN: Thank you, Mike.

Hello, and welcome. My name is Nich Striven. I'm an Engineer in the CEC's Appliance Office. This slide shows where we're at in the pre-rulemaking process. We're here at the public workshop. Over 15 days ago the draft staff report was docketed. The report contains the analysis and the draft proposed regulations. The comment period ends on August 31st of 2020. Written comments may be submitted to the docket directly from the website for this pre- rulemaking, and assistance in docketing comments is available from the Public Advisor's Office.

The Schedule provides 64 days for review and commenting. Staff will review the comments received, and where appropriate staff will revise the analysis and address comments and the next draft of the staff report. After the final staff report, the full formal rulemaking process can begin.

The goals for this workshop today are to one,

introduce the draft staff report and the proposed regulatory language to you. Two, gather your ideas, concerns, solutions, and recommended next steps. Please note that your written comments are due no later than August 31st by 5:00 p.m.

Let's begin the draft staff report and proposed regulations part of the workshop. If you have any questions during the presentation, you may type them in the question and answer function on Zoom. They'll be forwarded to the moderator. We can try to answer them in the question and answer function, or possibly answer them live if time permits. If we don't get to your question, please reach out to me using our contact information on the CEC Flexible Demand Appliance webpage.

You might ask, why do we need Flexible Demand Appliance Standards? California residents are often asked to flex their power by scheduling and shifting appliance operations to other times of the day. Integrating connectivity into the appliances provides the consumer with important tools to manage their utility bills to provide consumers with additional features. Consumers can align their electricity demand with renewable supplies to avoid greenhouse gas emissions. Flexible demand standards for appliances will ensure that consumers will be able to do all of this with minimal effort.

Pool controls allow owners or operators to control various aspects of pools. A pool controller schedules the start and stop of pool maintenance operations. Some controllers also control the operation of the pool heater, sanitizer, valves, water features and lights. All controls may be integral to the pool pump or may be a separate device to that remotely controls the flow pump.

Many pool controllers can provide a user interface on a computer, tablet, or cell phone. According to the residential Appliance Saturation Survey there are estimated to be around 1 million pool controls in the five load-serving entities of California. Staff analysis indicates with a few small changes, future pool controls that come out of the box with a default operating schedule and connectivity, can maximize the use of renewable energy and provide additional consumer functionality.

Requiring consumer protection measures such as cybersecurity and customer consent complements the connectivity requirements.

Staff analysis indicates for a small average incremental cost, California flexible demand pool controls can shift electrical grid energy, help the consumer better manage their utility bills, and improve air quality around electrical generation plants in many disadvantaged

communities across California.

Details of the staff proposal can be found in our docket, and at this link in our slide package. Chapter 5 contains the staff proposal and a discussion of the alternate proposals. Appendix A contains the staff proposed regulatory language. The proposed effective date is one year after adoption. Staff seeks public comments on the proposal.

The next seven slides will highlight some of the definitions in the Appendix A proposed regulatory language. After the definitions, there are slides that highlight the results of the analysis. Staff will work to post these slides and the transcript in the docket before the comment period ends.

This slide highlights some of the definitions found in the proposed regulatory language. The proposed regulatory language definition of a "pool control" is, "a pool control means any component or group of components that: 1) causes the pool filter pump and other pool equipment to start or stop operation, and 2) use a single-phase AC power as input power. Pool controls exclude pool controls marketed exclusively for use as a control for a pool filter pump with a rated hydraulic horsepower greater than 2.5.

"Flexible demand," means the capability to

schedule, shift, or curtail the electrical demand of a load-serving entity's customer through direct action by the customer or through action by a third party, the load-serving entity, or a grid balancing authority, with the customer's consent.

"Consent" means a customer's permission or agreement to use the capabilities of the appliance subject to this Article to schedule, shift, or curtail its use through direct action by the customer or by a third party load-serving entity, or a grid-balancing authority. Consent may be expressed or implied.

"Connected device" means a device that is capable of receiving TCP/IP signals from the Internet, with or without the connections through common home network equipment or radio broadcasting, by means of integrated or separate communication module.

"TCP/IP signal" means a type of data format used to carry data through the network. Regarding the default operating schedule, the pool control shall be equipped -- sorry -- the pool control shall be shipped with a default operating schedule setting that starts no earlier than 9:00 a.m. Pacific Standard Time, and finishes no later than 3:00 p.m. Pacific Standard Time for the following operations: any operation of the pool filter pump at more than 50 percent of the maximum operating speed of the pool filter

pump, any operation of the pressure cleaner booster pump, and any operation of the electric pool water heater.

During periods of daylight, Pacific Daylight Time, the start time of the default operating schedule shall be 8:00 a.m. and finish time shall be 2:00 p.m.

This highlight type -- the slide highlights some of the definitions found in the proposed regulatory language. These definitions are found in the draft staff report Appendix A, Section 1691 of the proposed regulatory language titled "General Reliability and Cybersecurity Standards."

Next step, I'll highlight some of the metrics from the analysis that are in the draft staff report. So let's begin that section. If you have any questions during this part of the presentation, just type them into the question and answer function on Zoom and they'll be forwarded to the moderator.

This graph shows a comparison of the Hourly Electric Load Model, otherwise known as HELM, load for a single load serving entity during a single day in the year 2033, compared to the baseline load in 2033. This graph is an example of PG&E. Staff created analysis baselines are a total of five load serving entities with datasets and forecasts available for SMUD, SCE, LADWP, PG&E and SDG&E. These five load serving entities represent the majority of

the electricity used in California.

Staff created a 1-year and a 10-year baseline to account for changes in compliance rates, marginal GHG emission rates, and TOU electric rates over a 10-year period. When the HELM load shape data was collected, TOU electric rates were not as widely available as they are today. A baseline was created to account for the full control owners and the five load serving entities that have shifted their pool controls based upon electricity time of use rates after the HELM data was collected. The assumed percentage for those who have already made the change to TOU rates is 30 percent. This change in the daily load is shown by comparing the orange HELM load profile to the blue baseline load.

Staff also considered the pool control consumers that will change the default schedule when they first install the pool control. Staff analysis metrics represent the savings from the largest five of the 82 California load serving entities. The other pool control consumers from the 77 smaller load serving entities for the purposes of the analysis are assumed to represent the individuals in California that have decided to change from the default schedule to meet their personal preferences. Since they simply opted out by changing the default settings, they're not included in the draft staff report estimate and

estimated savings metrics.

Staff analyzed four load shifting strategies they differ by scheduling algorithm used for pool controls. The graphic shown here is the proposal that is based upon a default schedule for each day. Staff proposes a default schedule for major pool operations. The default schedule would command pool heater, pool cleaner pressure booster pump, and the high-speed pool filter pump to begin and complete operations between 9:00 a.m. and 3:00 p.m. Pacific Standard Time. During the days of the year when time transitions to Daylight Time, the window of operation will be 8:00 a.m. to 2:00 p.m. to maintain alignment with the local sun.

We can see in this graph the orange line representing the major pool operations would be completed before the green to you price increases in the afternoon helping consumers manage their electric utility bills during the hours of 9:00 a.m. to 3:00 p.m. in California when the sun is shining on the solar panels providing the electrical grid with clean energy. The default schedule alignment minimizes the GHGs from electricity generation and is advantageous to consumer utility bill savings.

Staff analyzed the avoided greenhouse gases for the proposal and three alternates. The proposal a default schedule: Alternate 1, a time of use electricity rate base

control. Alternate 2, a greenhouse gas emission rate based control. Alternate 3, a time of use electricity and greenhouse gas emission rate based control. This figure provides a comparison of the GHGs avoided under the four load shifting strategies analyzed by staff.

Shifting load TOU electric rates yields the smallest GHG emissions avoided. The smaller reduction is due to the TOU electric rates not being aligned with marginal emission rates for the California electricity supply. Shifts of energy demand tied to marginal GHG emission rates yields the most GHG reduction, because the pool control will find the lowest GHG emissions for each day to operate. Following a combined TOU and GHG emissions signal leads to GHG emissions avoided that is less than following only a GHG emission signal.

The default schedule creates nearly the same GHG emissions avoided as a shift tied exclusively to GHG emission rates, which is due to the consistent hours when the GHG emission rates are low. Staff proposes the default schedule option, because it achieves a significant quantity of GHG avoided while providing consumers with significant utility bill savings and is relatively easy to implement by manufacturers of pool controls. The consistent daily pool operation schedule will enable high consumer acceptance of the default setting.

This table shows pool controls statewide annual avoided GHG emissions metrics, and the value assigned to GHGs using the social cost of carbon. The GHG scheduling alternative is predicted to have the greatest amount of avoided GHG, because the algorithm is designed to optimize operations based on a GHG signal. The TOU scheduling alternative is focused on optimizing the consumer bill savings and does not consider GHGs. This is the reason why it ranks the lowest for the avoided GHGs.

The TOU and GHG alternate is predicted to have some of the benefits following a GHG signal, and a TOU price signal. This alternate is the most complex to implement, because the real world will require multiple data inputs to evaluate when to operate the pool equipment. The staff proposal with a default schedule focuses the significant pool loads from 9:00 a.m. to 3:00 p.m. without the need for an advanced control algorithm.

The default schedule is predicted to be the easiest for manufacturers to produce and it's simple to verify for compliance. A 9:00 to 3:00 schedule simply aligns pool control load with California's grid renewables, avoiding GHG emissions and helps customers manage their utility bills.

This table shows the pool control statewide permanent load shift from peak for the proposal and the

alternatives. For the purpose of the analysis, "peak" is defined as 6:00 p.m. to 10:00 p.m. The definition covers the CAISO top four hours where the grid could experience a shortfall in supply. During a single day in August, the analysis shows all the proposals equally shift the load away from 6:00 p.m. to 10:00 p.m. As the analysis expands out to an entire month, we see the TOU alternate dropping off in load shift from 6:00 p.m. to 10:00 p.m., because TOU rates are prioritized.

Looking at the permanent load shift over a full year, the default schedule has the greatest amount of load shift from peak, because the pool control is on a default operating schedule. The connectivity component of the proposal could provide additional load shift from individuals that have changed from the default settings and are participating in a demand response program.

Additional contributions from the third-party Demand Response Program load shifts are not included in the analysis at this time. Shown here are the first year and tenth year metrics for the five load serving entities for the proposal, a 9:00 a.m. to 3:00 p.m. schedule. The analysis was conducted at an hourly level for each of the five load serving entities during the year 2024, for the first year of the regulation. And the year 2033, which is predicted to be when complete pool control stock has been

replaced with the 9:00 a.m. to 3:00 p.m. default schedule models.

The alignment minimizes GHG emissions from electricity generation and is advantageous to consumer bill savings. For LADWP, the predicted utility bill savings values are zero, because of their current fixed price tiered rate structure. But there are still significant GHG emissions avoided with the default schedule. Depending on future TOU rates selected by LADWP, their predicted savings could be similar to those of other load serving entities. Staff used the best data available for the analysis to determine the impact from the proposed 9:00 a.m. to 3:00 p.m. schedule. Moving forward with these first standards for pool controls establishes a framework for flexible demand applying standards. Next steps can build upon this framework, and appliances can be revisited along the way. The proposed regulatory language has been structured in a way that facilitates future work. When better data is provided to the CEC for analysis, additions and updates would be considered.

The proposed standard is technically feasible and can be met with many existing models and technologies today. Shown here on this slide are a sampling of two products sold today that are very close to meeting the CEC proposed standard. One of these products sells for about

$84 and the other sells for about $70 both with free shipping.

The proposed alternates are also technically feasible with today's connected technology, utilizing the CEC Market Informed Demand Automation Server otherwise known as MIDAS or participating in other consumer selected third-party services.

I hope that sharing these alternate connected control strategies ideas with you today will inspire you to think beyond the minimum CEC standards and incorporate these advanced features into your product designs.

The staff proposed standards are cost effective using a simple utility bill savings analysis. Staff estimate the incremental costs to be $70 to add scheduling and connectivity to pool controls. There is a positive savings to investment ratio for the standard, and the average consumer will be paid back within the first year. Over the 10-year life cycle, the average customer utility bill savings for customers on TOU rates are $1,225. Research indicates a 10-year life expectancy is a conservative approach. If the pool control lasts longer than 10 years, the total savings will be much greater than the number shown on the slide here.

The staff proposed standards will help California avoid GHG emissions and help the consumers manage their

electric utility bills. Staff estimate that during the first year of the standard, there'll be $11 million dollars of consumer utility bill savings and $2 million worth of greenhouse gases avoided. Staff estimate that during the tenth year of the standard, and every year after there will be about $170 million of consumer utility bill savings, and $27 million worth of greenhouse gases avoided.

What I've shared with you today is just a small sample of the draft staff report that is in our docket for you to review in detail.

Right now time is 9:47, so we're a little bit ahead of schedule. So we'll just pause here for a second to give the court reporter a break. And we'll take a look at the Q&A question questions. And we will start back in a couple of minutes.

MR. HELFT: Hello, Nich? Let's answer a few questions now if you have time and then we'll take a break after that, and we'll be a little more specific about when we will restart. You ready, up for a few questions?

MR. STRUVEN: Sure.

MR. HELFT: Okay.

MR. STRUVEN: Let’s just make sure the court reporter is still ready.

COURT REPORTER: I am here, thank goodness.

MR. HELFT: We'll take away --

COURT REPORTER: Okay.

MR. STRUVEN: So Bruce, do we have a question in that Q&A there (indiscernible)?

MR. HELFT: (Indiscernible)

MR. HWANG: Our first question is from Bruce Nordman of LBNL.

"The first slide mentioned Open Source. What software are you referring to or do you mean open standards? Do you agree with common definitions of this as found in Wikipedia? Open Standards are standards made available to the general public and are developed or approved and maintained via a collaborative and consensus driven process. Open Standards facilitate interoperability and data exchange among different products or services and are intended for widespread adoption." End of question.

Nich, you're muted. Are you trying to --

MR. STRUVEN: When you refer to the first slide mentioned as open source, is that the statute that he's talking about?

MR. HWANG: Yes.

MR. STRUVEN: Maybe we should let him talk?

(Indiscernible)

MR. HWANG: Bruce? Bruce Nordman, are you available to elaborate your question?

MR. NORDMAN: Oh, sure. Yeah, I didn't realize I

was unmuted. Yeah, one of the first slides in this slide set mentioned open source. And I was just unsure what is being referred to. I assume you're talking about open standards, which is a very different concept from open source software.

MR. STRUVEN: Okay, I understand what you're asking. So in the slide we were quoting our statute from Senate Bill 49, which talks about that our standards shall be -- contain open source and cyber security. So that's really open for us to interpret. So if you have some specific input of going one way or another, what we're trying to do is really keep our standards open enough to allow multiple pathways to achieve this. So if there's a very specific definition you'd be interested in us to follow, then please provide that comment to our docket so that we could share that with everybody.

MR. NORMAN: Yeah. If that's the term used in the statute, I would just say that the statute is using the wrong term, which is awkward, I realize. But we should recognize that and not pretend otherwise.

MR. HWANG: Okay, thank you.

MR. STRUVEN: Thank you. Is there another question that anyone has?

MR. HWANG: The next question from Geoff Wickes. Has the CEC done much evaluation on how homeowners support

connectivity with wi-fi for pool pumps?

MR. STRUVEN: Yeah, we've had some discussions with the pool control manufacturers of the different pathways that customers are using connectivity. So we have had that discussion. In our docket I think there is a few of those pathways spelled out, so I hope that answers your question. And I predict that maybe Geoff might have another question following.

MR. WICKES: Yes, thank you. This is Geoff Wickes with NEEA Emerging Technologies.

One of the things we found with a pretty big load here in the Northwest is with water heaters. And we found that connecting wi-fi to water heaters, or wi-fi or even to thermostats was really exciting for the first period of time for homeowners. And then after changes to either wi-fi passwords or gates, they lost interest in it and connectivity was dropped. So it's having that pathway is problematic for long-term savings. So we're suggesting that there might be an alternative pathway, still have a wi-fi pathway for consumer experience if they want to have it. But for controlling on a regular basis, you might, especially if you're going to get into dynamic loads or load management, rather than the prescriptive ten to two or three. So I would just make the comment that wi-fi can be problematic for the homeowner.

MR. STRUVEN: Thank you, Geoff. And we also have a period coming up later that --

MR. HWANG: There's a question from Jorge Gamboa.

"Just for clarification, most of the poo1 controls today include Alternative 1. This entails basic and complex scheduling procedures for filtration pump speeds and heater setpoints. Question, will this capability be considered compliant ready?"

End of question.

MR. STRUVEN: Yeah, I'm not sure if I can answer that, with that amount of details right now. But what we -- there is in our draft staff report, there is Appendix A that I had highlighted with the proposed regulatory language. And if you wanted to you could take a look at a specific item that you've had in mind, a specific model, and compare it to the requirements in the proposed regulatory language. And if there's any concerns, then please submit a comment to us with the proposed regulatory language highlighting what should be changed or what you recommend be adjusted.

MR. GAMBOA: I guess the integration was simpler than that. Basically, I was just looking at the deck and the staff recommendations are Alternative 1, 2 and 3, which includes the time of use, the avoidance of emissions. And then looking into the detail of only the time of use

scheduling it mentions. I mean, any means for the users to select, in a specific time variation of the filtration process, maybe changing the setpoints at some point. And those things already exist on pretty much all the pool controllers. And I use wonder if those will be considered compliant already with that functionality in place?

MR. STRUVEN: It's possible. We'd have to look and see if you know, all the details are met. I mean, it's -- since I don't know exactly the model you're talking about it's a little difficult to answer live. But please reach out, we can go over it and talk about that specific model and see how it does.

MR. GAMBOA: Thank you.

MR. HWANG: A question from SkyCentrics, Tristan.

"You mentioned TCP/IP as the mandated connections standard. This is a very low bar. If OEMs provide that, there is no common set of commands that they will be required to follow. Therefore, every OEM will have a variety of commands. And every aggregator or utility will have to learn them all. Is there any plan to coordinate around a common set of commands?"

MR. STRUVEN: Yeah, that's a good comment, Tristan. I had mentioned in one of our slides that we're setting up the framework for the standard. And as we go forward, we can come back and revisit the standards as more

data is available. So as we get more information, more data on how specific requirement maybe benefit or may help this, then we can include that and make that update.

MR. DE FRONDEVILLE: Yeah, this is Tristan at SkyCentrics. It's just interesting that as the person just prior said, a lot of controllers already have scheduling. They already have connectivity. And so the default schedule is really the only thing new. Whereas focusing on a set of commands, so that a utility can send all the controllers a single command essentially, let alone the fact that there might be different APIs to every single OEM, so that that is where I think the Commission could really benefit from moving the ball forward. So that's what I want to encourage.

MR. STRUVEN: Okay, thank you, Tristan.

Do we have any other unanswered questions? We have about two minutes left, and then we need to move on.

MR. HWANG: There is one more question from Geoff Wickes.

"Will the CEC use a connectivity standard like CTA-2045, that has standard command structures? Because TCP/IP has a wide variety of command structures. I second SkyCentrics' comments.

MR. STRUVEN: Yeah, that's a good comment, Geoff.

Thank you, and it's definitely something that has been discussed and we'd like to see what all the stakeholders, the pool control manufacturers also have to say. So we'll be finding out on or before August 31st in the comments.

MR. WICKES: Geoff Wickes with NEEA, thank you for considering it. I think there's already some command structures in place that could easily be deployed and/or used for pool pumps.

MR. STRUVEN: Okay, doing a time check right up at 10:00 o'clock on schedule with our agenda. So next up, we have a representative from the CPUC who will provide comments on the proposed standards, followed by a guided discussion from a Respondents' Panel moderated by Bruce Helft, a member of the Flexible Demand Appliance Standards team.

Daniel Buch is the Program Manager for Electric Rates, Customer Generation, and Demand Response branch of the Energy Division at the California Public Utilities Commission. Welcome, Daniel.

MR. BUCH: Good morning. I want to start by thanking the Energy Commission for inviting me today to speak with you. By way of introduction, just a little bit about me, I'm the Branch Manager for the Retail Rates, Customer Generation and Demand Response branch in the California Public Utilities Commission's Energy Division.

That's my current title. And in that role, I oversee CPUC staff efforts related to demand flexibility, including staff support for a new rulemaking proceeding devoted to demand flexibility that the CPUC opened last week.

I also cut my teeth as an Energy Efficiency Analyst at the PUC. And so I've had the opportunity to work with Energy Commission staff over the course of my career on all manner of standards, Appliance Standards, Building Standards, and now Load Management Standards and Flexible Demand Appliance Standards.

Going back to the CPUC's efforts on demand flexibility, in addition to the new rulemaking proceeding, we also released a staff report last month outlining what we're calling the CalFUSE framework. That's the California Flexible Universal Signal for Energy. CalFUSE fuse draws heavily on the CEC's pathbreaking work in Load Management Standards, particularly MIDAS to propose a new opt-in rate design framework, incorporating dynamic rates, scarcity pricing, subscription charges, and transactive energy features to unlock and incentivize demand flexibility solutions for customers.

Then for those who are interested in learning more, CPUC staff will be holding an informational workshop this Thursday, two days from now, at 9:30 a.m. to present the proposal and answer questions from stakeholders.

Now pivoting to the Flexible Demand Appliance Standards, I want to take this opportunity to offer my enthusiastic congratulations to the CEC and to CEC staff on reaching this exciting milestone. These are the first proposed standard in Flexible Demand Appliance Standards. This is a crucial cutting edge initiative demonstrating yet again California and Energy Commission leadership nationwide on energy standards.

Then I want to offer a second congratulations to the CEC for hitting the ground running with a strong first proposal. The staff report shows that the proposed Pool Pump Standards will result in a windfall of GHG reduction through a simple cost effective default schedule with the opportunity for even greater future savings under other ratemaking frameworks.

Now let me let me turn there. I want to talk a little bit about sort of the path forward. And here is a question for CCE staff to some extent, basic Internet connectivity is a good baseline. Being able to update device settings is important to ensure that schedules can be updated easily, but the question here is does the current standard allow for Internet controllability of the pool pumps? It wasn't clear to me looking through the report. Can the appliance, the pool pump, do something when it receives data, the control signal?

And the reason this is important is that Internet controllability would enable devices to be scheduled to respond to dynamic prices or GHG signals by allowing the decision logic to be Internet based, but still allow for price or GHG response performance on the device. And so, one question is whether or it would be possible to add Internet controllability either to this phase or to a future phase in order to unlock that dynamic response.

Now why that's important, particularly from the from my vantage at the CPUC, is that future rates are unlikely to look the same as our current rates. We anticipate the introduction of more dynamic or hourly rates, and high differential TOU rates. We anticipate that those will be available on a widespread basis within a few years. And so these rates are targeted at larger flexible devices such as heat pumps and EVs. But any customer that opts into one of these rates will have the rate apply to all their appliances. So it's important that all the appliances to the extent feasible, can flex in order to respond to that dynamic hourly signal. And so I want to encourage the CEC to incorporate hourly rates, at least for larger flexible appliances in future phases of this rulemaking. As we really do think that that that is where ratemaking in California is headed.

Now one last comment for the CEC, which is future

oriented in response to some extent to Commissioner McCallister's comments at the beginning of this workshop, which is that we are really excited about this staff proposal, and we think that it makes a lot of sense. But we would also like to encourage CEC and its staff to be strategic moving forward and to tackle standards updates for the highest impact appliances as soon as possible.

There I'm really thinking about residential electric vehicle supply equipment, thermostats, electric storage water heaters, including heat pumps, and to a lesser extent batteries. And we think that those are the largest and most impactful appliances in the pipeline and as such should be a priority.

So a few things to consider. There are big investments being made now in electric vehicle supply equipment. Everybody's aware of the rapid pace of electric vehicle adoption in California and across the country and elsewhere. And so we think that electric vehicle supply equipment, which needs to respond, we need our EV chargers and EV batteries to respond to hourly signals, not the kinds of default scheduling here. And because they are likely to be one a major addition to the grid, and they have the ability to flex in a number of different ways, so that we can support the grid and reduce costs for all ratepayers and reduce costs for EV owners.

Second, battery manufacturers already generally include sophisticated control system, I'm thinking here of standalone storage. So that may be a lower priority, but electric vehicle supply equipment is really right up at the top.

Another thing for the CEC to consider when it's figuring out which appliance standards to tackle next, is which appliances have the longest useful lives.

And then finally, just something to consider. You know, the CPUC conducts demand response potential studies. And our most recent study is showing that there is significant technical potential for things like light-duty electric vehicles, and residential thermostats. But thus far, we have not been able to achieve that potential through our demand response program offerings or we have not been able to achieve -- we've achieved some, but there's a lot of technical potential still out there.

And we think that the dynamic rates are perhaps the key to unlocking that potential and having the response come from flexible loads and from load modification by the customer. However, the Flexible Demand Appliance Standards, and standards for that equipment will be crucial in ensuring that the device is actually can and will respond to the signals coming from rates.

So I want to close by congratulating this CEC

once again for a very strong proposal that really moves the ball forward on demand flexibility. And the CPUC staff looks forward to productive stakeholder feedback and ultimately the rapid adoption of these first-in-kind standards. And I want to thank the CEC for the opportunity to speak today and for its continuing partnership with the CPUC on demand flexibility initiatives. We look forward to continued staff collaboration between the agencies on these and other related initiatives moving forward. Thank you.

MR. HELFT: Thank you, Daniel, and for taking the time to step up today and make your comments. We heard them loud and clear. Good news is we're like minded and moving forward, as you describe.

Before we take a short break and start again at 10:15 I'm wondering if Commissioner McAllister had any thoughts that he'd like to respond to what Daniel said? If not, we'll just go silent for about five minutes and come back at 10:15.

Commissioner McAllister, yes, no?

(No audible response.)

MR. HELFT: I guess not. So, Daniel, thank you.

And to stay on schedule let's take a five-minute break. We'll resume with the Respondents' Panel at 10:15.

(Off the record at 10:11 a.m.)

(On the record at 10:15 p.m.)

MR. HELFT: Good morning, my name is Bruce Helft. And I will serve as the Panel Moderator for this 45-minute session. I'll just take a moment to let you know that I am joined today, here in our new offices headquartered at the California Natural Resources Agency at 8th and P, a Clean and Healthy Building, joined by our Electrical Engineer, Ho Hwang. And our Electric Generation System Specialist, Livinus Ishaya.

I serve as a Research Scientist and Energy Specialist for the California Energy Commission. And I'm a member of the Flex Demand Standards Team.

Today, we have four knowledgeable participants making up a Stakeholder Respondents' Panel. The stakeholder representatives will participate in an open discussion sharing their thoughts on the proposed language and draft staff report.

Three broad topics will be discussed. The panelists were given the topics ahead of time to prepare.

It is our hope that this guided discussion will stimulate thought and reveal strengths and weaknesses that staff can then use to improve the final report and regulatory language. Further, we hope that it may serve to set the stage for comments by the public, immediately following this panel. The plan is for our discussion to take us up to 11:00 a.m. If we finish sooner, we'll just

go ahead on to the public comments when we finish up this Respondents' Panel.

Joining us today are, from the Natural Resources Defense Council Inc. Pierre Delforge, Director, Clean Buildings. From the Pool and Hot Tub Alliance, Jennifer Hatfield, Regulatory Affairs, Consultant for Pool and Hot Tub Association. From Pacific Gas and Electric Company, Mary Anderson, a Program Manager, Codes and Standards. And from WattTime, Henry Richardson, an Analyst. WattTime is an environmental tech nonprofit that empowers people, companies, policymakers and countries, to slash emissions and choose cleaner energy.

Let's go to our first discussion. Ho, are they all unmuted?

MR. HWANG: Yeah.

MR. HELFT: Great. Thank you. Thank you, Commissioner.

As we just heard, staff developed and evaluated four scenarios, and is proposing a standard for pool controls that require a default schedule.

"How does the statewide standard for pool controls that prescribes periods of operation to be during times of low GHG emission intensities and cheaper electricity rates, bring benefits to pool owners, residents and low-income and or disadvantaged communities, consumers,

others?"

MR. HELFT: Yes, I was not going to call on you individually. I was hoping that you could just discuss as you would, if the five of us were together, and speak up whenever you have something to say please.

MR. DELFORGE: Well, somebody needs to go first. So maybe I can jump in and open the way and hear from my colleagues afterwards.

So first, thank you, Bruce. And my name is Pierre Delforge, I'm now with the Natural Resources Defense Council and I lead analysis and advocacy work on building and decarbonization. And I'm thrilled to be here today with all of you, and I congratulate you on this milestone. I think this first staff proposal on Flexible Demand Appliance Standards is leading to a momentous event once it gets adopted, similar to the Title 24 Building Code or the first Title 24 Building Code and the first Title 20 Advanced Energy Efficiency Standards. It's certainly as important in our view as we focus on science-based climate targets that will require complete decarbonization in the building sector and you know, full controls are a part of that.

Building decarbonization means we need to use the least energy from the cleaner source at the right time. So this energy is energy efficiency, cleaner sources from

electricity, and from clean electricity to a renewable electricity, and at the right time is demand flexibility. So it's one of the three major pillars for decarbonizing our buildings. It will reduce emissions by avoiding electricity use from the dirtiest power plants. It will also enable a highly renewable grid by adjusting demand to when renewable energy is available.

But perhaps most importantly, and one I want to emphasize -- and the reason I want to emphasize the most, is that demand flexibility is going to put downward pressure on electric rates. Because it reduces the cost to meet demand. And it shifts the use of electricity to times when it is cheap and abundant. And that's really important as we look to decarbonize and to shift electricity use to clean energy, is we need to make sure it's affordable. It's cost competitive. And it's accessible by all, so we can fully decarbonize the building sector.

So that's one of the key things I see behind demand flexibility. It enables us to cost effectively and affordably decarbonize the building sector. And I think these standards are a first step toward that. Obviously, there's many more steps to be taken. But I think it's a good first step. So I'll pause here and open it up for my colleagues.

MS. ANDERSON: So Pierre, I really appreciate

what you said. I want to second that the CEC really did find a novel solution to really difficult issues. And the power of these standards has the opportunity to increase the deployment of grid enabled technologies that are needed for decarbonization, and reduce costs and benefits for all consumers, especially those who are typically disadvantaged.

And we believe that the pool controller standard can help consumers reap benefit from current and future electricity rates by promoting off peak appliance operation, which should reduce costs, as well as reduce greenhouse gases. And I think that is a wonderful -- this is a wonderful step to begin this journey, so.

MS. HATFIELD: Good afternoon. This is Jennifer Hatfield. I represent the Pool and Hot Tub Alliance. And you know, I want to first note that we applaud the CEC for their work on this proposal and thank them for allowing us an opportunity to be a panelist today.

Our members support the efforts to reduce the energy demand by establishing the statewide standard for pool controls. And we'd want to note that the good news is that modern pool controls already exist in the market, and are being used by some consumers, pool owners, already to provide a total connected control operation for the entire pool pad. And it’s important to note that includes the

pumps, the sanitizers, chemical regulators, the heater, the lighting, etc. The use of the controls can be optimized for the emissions.

And excuse me, sorry. I hope everybody can hear me, my Internet was going in and out.

So having a statewide standard will hopefully mean more homeowners will take advantage of this option to lower their utility bill and lessen demand on the grid for the benefit of all Californians by shifting equipment operations to the lower peak times as practically as possible. It's important to note practically as possible is also critical to ensure the safe operation of the pool. So there's got to be that minimum flow and turnover rate to maintain proper water quality. Otherwise, the consumer is going to end up with a green pool that may not utilize -- they may then decide not to utilize this program. So we believe that proposal does provide the flexibility needed to account for this in most cases. You know, we'll have some thoughts on improvement, but we believe this is a good first step for pool owners and consumers and for all the citizens of California. Thanks.

MR. RICHARDSON: I think I would add here as well that the paradigms shift away from an event-based DR to continuous optimization is a pretty large paradigm shift for demand management. And that's kind of a new way of

thinking about load management for consumers. And so a pool owner would actually -- I think the staff report very clearly demonstrates both the benefit to pool owners and other residents of California. I don't know that there's a lot to add here other than there's, I think, a relatively low cost option to get a lot of benefit.

One thing that isn't potentially addressed, is the potential emissions benefits that are non-CO2, so health damaging pollutants like NOx, SOx, and particulate matter. By shifting away from those dirty generators we would have a benefit for those local residents and adjacent to those power plants. So the less we can rely on those dirty generators, the better and can stock up excess renewable energy.

MR. HELFT: I'm glad you raised this point, Henry. Because one of the primary, if not in the first position, in terms of what is to be considered when implementing Senate Bill 49 is the reduction of greenhouse gas emissions. And that's why Bullet Number 2 in this discussion topic is important, because even though there may not be pools in certain communities, there is an advantage widespread throughout the state for the option that's been proposed by staff.

Did anybody have any comments or thoughts about how the proposed standard benefits residents of low-income

or disadvantaged communities other otherwise?

MS. HATFIELD: I will just note, this is Jen Hatfield again with the with the Pool and Hot Tub Alliance. It wasn't just swimming pools are not prevalent in these communities, however the same benefits to pool owners should apply here, because of that overall reduction in the grid load during peak demands that may indirectly benefit these communities.

MR. RICHARDSON: Well, one thing we like to emphasize here is that consuming -- if you increase efficiency adjacent to a power plant, it doesn't mean that power plant will reduce load just because of how the grid is managed in marginal pricing. So a load reduction anywhere could affect the dirtiest peaker plants, which are often in the Central Valley. And so load reductions on those power plants will mean that they pollute less and less pollutants will be trapped there, hopefully. And so I would say that there's not a -- adjacency is not an indication of benefit in terms of load reduction.

MR. DELFORGE: This is Pierre. The only thing I would emphasize is to try and maximize the grid benefits. And when we talk about the grid is not an abstract, you know, it's not a grid for itself. It's because the grid costs are societal costs, a cost borne by all customers and low-income customers are often the ones who have a

disproportionate portion of their disposable income spent on energy, and who experience energy burden. So the benefits on reducing grid costs and putting downward pressure on rates really benefits low-income customers disproportionately.

I just want to also address the question of why do we need standards for pool controls? And if we have a technology that already has this and people can voluntarily adopt it, why are we just not waiting for that to happen? And I think the real question here is the magnitude and the urgency of ramping up demand flexibility, we're seeing today already some supply constraints on the grid during hot summer evenings with some potential reliability risks. And that's today's issue and tomorrow's issue for the next few years, as we move towards decarbonized buildings and electrification of heating.

In particular, we're going to move towards a winter morning peak. For those of you who were on yesterday's workshop, I think some interesting slides were showing how the grid is going to evolve to be peaking or be strained on winter mornings when it's coldest and heat pumps are working at full speed and there's no renewable energy on the grid. It's before sunrise.

And I think we need to -- these appliance standards have a long line of sight. They take ten years

to transform the market, so that problem, the time to address it is now. And I know we need to think about how to shape the market starting today, so that we mitigate this issue that we can see coming, and that will be an issue if we don't act today.

So I think standards are the right way to set the stage for all of the industry to have certainty, to have a clear line of sight, and to know where to invest and where the market is going. And to do that at a pace and scale we need, to address our challenges proactively.

MS. ANDERSON: So one of the things that I want to add to what Pierre said is that we've learned from the CPUC evaluations, that behavioral changes and being able to shift demand to off-peak times works, that it doesn't work long term. And so having been able to remotely control or manage the use of not only pool pumps, or other appliances as well, can improve the longevity of the savings and the reduction in greenhouse gases.

And I think that's really important. We all have the best of intentions, but sometimes we lose steam as we continue to try to do the right thing. So I think this SB 49 flexible demand, as we move towards -- you know, further down the road I think that ability to kind of bring people back to what they intended, is going to be a huge benefit going forward for all consumers, not just those who own the

appliances.

MR. HELFT: Let's move on to the next topic please, advance to Topic Two. "How can the proposed standards for poor controls be improved, to better address the reliability of the electricity grid in California?" That is that energy efficiency is kind of a clear lane with in that you can use less amount of electricity to perform the same amount of work. That's energy efficiency.

In the case of Flexible Demand Appliance Standards, we're talking about shifting load. And I'd like to hear your thoughts on how that actually can improve the reliability of the grid. Is there a direct connection between shifting load and grid reliability?

MS. ANDERSON: So this is a big piece for PG&E. PG&E supports using SB 49 standards that would increase the deployment of grid-enabled technologies with two-way communication between the consumer and the grid or the utility, such as open ADR communication. It would be useful to leverage the proposed connectivity feature to actually access and take advantage of rate and GHG information, such as information from the CEC's MIDAS database. This rulemaking lays a wonderful framework for future operations where devices can flexibly respond to price and GHG signals.

And I think part of what makes this really

important is as we improve the availability, it reduces the cost and allows our disadvantaged customers or disadvantaged communities to be able to own at a reasonable price these grid-enabled technologies. So they can also manage their bill seamlessly and not have to think about it just as you know, many other people will also be able to do. So we see this as a really important component and the CEC has one of the strongest tools in their toolbox to be able to make this happen from our perspective.

MS. HATFIELD: This is Jen Hatfield again with PHTA. You know, we believe the CEC's generally on the right track in using full control to shift load and address grid reliability. The critical items we believe would be to have simplicity and value for the end user. Otherwise users will simply opt out if the program is cumbersome, difficult to use or if they experience problems with full sanitation. To this point, the standard should consider maybe including the allowance of low speed filtration outside of the 9:00 a.m. to 3:00 p.m. default run schedule.

Another aspect, you know, our members have noted as we're reviewing the report, you know, is how will the standard incentivize or require that the separate pool control is purchased and connected? You know, if the objective of the standard is to connect all newly purchased pool pumps, that may be something that needs to be

reconciled so to increase that you better address the reliability on the grid in California.

You know, a couple other things. I mean we've just as we've been reviewing that's important, we think the pool controls need to have the ability to be readily connectable. But the wi-fi interface, radio transmitters, should be allowed to be sold separately and not required to come with the product so long as that product includes provisions for connectability. And one reason for this is, you know, main manufacturers aren't going to know where the products are going to be shipped.

And I know there might be some questions that come up later, other states may have different default schedules in the future as well. So, you know, that's something that we think is something that should be thought about. And another critical reason for that suggestion is that some of the proposed requirements could stifle innovation. Many existing pool controls don't have the level of scheduling in their design. And we think more time needs to -- we need to have a lot more time to implement. But also, for example, if the client already has a connected pool pad and just wants to upgrade their pool controls, they wouldn't need to pay for Internet transmitters if they already have a compatible system in place. They can just purchase the pool controls that

include provisions to connect to their existing systems. So that's just some of the thoughts we had about increasing that. Improving, you know, the proposal and thereby the reliability on the grid.

And I know this may be somewhat off base, out of scope. But one of the things that has come up as a challenge here in California is you're trying to adjust the reliability on the electricity grid, but we also have the reach codes and decarbonization efforts to eliminate gas. And that's forcing a lot of these new construction pool designs to use only the electric heat pump pool heaters, which increases the electrical load versus the gas heater. And I get it. I just think it's an interesting dilemma that we have as we're trying to address both factors. But that's just some of our thoughts.

MR. RICHARDSON: That's really interesting. I think it's a balance of our decarbonization goals and grid reliability goals, which I think this standard really tries to address. Which is not only to electrify but to electrify intelligently, so that we can get both of those outcomes, which is decarbonization and less reliance on natural gas. As well as maximizing the emissions benefit of that electricity consumption while trying to avoid negatively impacting the reliability grid.

And I think one of the most powerful things about

this standard right now is that default. Because it is a default, people have to actively opt out. And so just like organ donations is much higher in states where it's a default on your license. I think it's just acknowledging that by making it required and standard and every device we will have much higher adoption rates, even if a small percentage of people do choose to opt out.

I don't know if that -- does that kind of begin to answer some of those questions?

MR. DELFORGE: Yeah, if I can chime in, I completely agree and second what Henry just said on personal default. And on how this standard is critical to help balance these objectives of reliability and decarbonization.

I think there are two things that can be done with this standard to further address or accelerate the help on reliability on the grid. One is on the connectivity requirements. And I know this is one of the third topics, so I'm going to save it for the next discussion. But the second one is actually to go into effect as quickly as possible, and to open, you know, to lay a good foundation for the next set of standards. So really pool pumps and pool controls are important, but they're not the biggest load or the elephant in the room.

And I'm going to echo Dan Buch's comments, and

his opening comments, are the electric vehicle charging stations, electric water heaters. And those are the big elephants in the room that we need to address very quickly. So the better foundation we can set and the quicker we can afford to address those big loads, I think the more impact we're going to have on the reliability on the grid.

MR. RICHARDSON: Actually, I want to echo Daniel's comments here as well. I think default schedules and connectivity are two of the key steps. But a third critical step is the controls necessary to actually shift that load based on that signal. So connectivity alone is insufficient. You also need the ability to control that device to respond to signals.

And I would consider the default schedules necessary for devices that drop out of connectivity where it's hard to communicate with them. But it's like a blunt axe, when you're trying to like shift load dynamically in response to changing grid conditions. Not every day will have the same amount of solar. You want to avoid peaks in different ways. Maybe you want a morning bias or evening bias, I think there's a lot of additional sophistication that could be achieved with active connected controls, instead of default schedules.

The ability to communicate can be so much more than -- it can send commands that can explain state not

just update the default schedule or things like that. I think that's a pretty, that's a big step in terms of sophistication. I think Daniel from the PUC addressed this pretty comprehensively.

MS. ANDERSON: So one issue, one worry that I have with pools, is that it isn't just the consumer who manages the controls for the pools. It's also their pool professional. And the pool professional, based on research done by the PUC, indicates that they change the scheduling to be on when they're there, so they can see if it's working. And they try to put it on for as long as possible, so they don't have to spend as much time brushing the pool. And so putting it back, so it can default after a specific time. Or indicate to the customer somehow "hey, if you changed your schedule, it got moved back on this date or something, and if you move it back you could save X number of dollars, or you could save money".

I think providing that ability would be huge, especially with this technology where consumers don't always pay attention to when their pool is on. They don't notice and they're not the ones that are taking care -- typically most consumers have someone else handling the operation of this major appliance in their home.

MR. RICHARDSON: You think a maintenance mode, or a "must run" like button would address that as well? Like

"run now," so that I can see it running, Mary?

MS. ANDERSON: Potentially? Potentially. I think part of it is training for pool professionals as far as what that means. But I think it's just so habits are hard to break, right? And I think this has been a habit for the pool industry for decades. And it's not a bad thing. It's just not optimal for greenhouse gas reductions or cost reductions for the consumer.

MR. RICHARDSON: Similarly, do you think pool maintenance companies should be as much of a target of this standard as owners, in the sense that they're going to be the ones adjusting schedules, actively managing the devices? Are they a useful kind of means of more effectively more implementing standard?

MS. HATFIELD: Well, and this is Jen, and I would say yeah, definitely. I mean, you know what we've done historically at Pool and Hot Tub Alliance is provide a lot of education on certain regulatory requirements, whether they're at a state or federal level. And I think when this proposal is a final rule, we'll do the same.

You know, we need to -- and our manufacturers also, they work to help educate the builders and service professionals that utilize their products.

So I think it's definitely important that whatever the final rule is, that we work to ensure that

they understand what is being put in place in California. So they can help educate themselves, but also educate the homeowner. So I think that's something -- the collaboration that we look forward to doing, and hopefully in leading that effort with our partners in California

MR. RICHARDSON: There's a somewhat linked question that came in from the chat, could Jennifer provide what percentage of pool pumps market is in California, and do other parts of the US require demand response and/or other types of time-of-use controls? Do you know that?

MS. HATFIELD: I can tell you that I know part of it. We're not aware of any other mandatory demand response or voluntary demand response pool pump programs. But I think that California tends typically as a leader in these things, so we do think that that will grow and follow. So yeah, not yet is the answer on that. But as it does grow, that's why I made my comment that that is some of our concerns, though. Is that manufacturers can't just say, "Oh, these are going to get shipped to California versus Iowa versus…" You know, that's something that we know for a fact, for future.

Regarding the percentage of pool pumps in California, I don't have an exact number right now. I'm definitely happy to find that information and get to it. I mean, we do know California is really an extremely large

market for the pool industry. So but the exact percentages, I'd have to find that out and comment back later.

MR. HELFT: In the appendix of the staff report, you will find this kind of data that we use to project all the way through 2033. So it is in our report.

I did want to pick up on something that Mary said, and others as well. Modeling after what's being done with the Tech Initiative in terms of heat pump water heater promotions and installs here in California, outreach and education, to in this case the maintenance and pool installers, will be very important to help them know how to install these properly. And set them up properly, even though they're coming out of the box already with the default mode, as we described in the standard. But also to educate the consumer. So that gets back to what was being discussed by Mary as well.

So we look forward to working with our partners at the IOUs, who have helped us so much in the past with getting outreach and education programs, trainings, FAQs, fact sheets, graphics, even videos and YouTubes out, so we can help educate all who will be involved with this.

I'm very pleased with all this discussion. I thought maybe we should just move on to the Topic 3, because that one has been mentioned a few times. The

connectivity requirements for appliances under the scope of this authority are intended to accelerate the market towards adapting technologies that enable devices to receive current and future time varying rates, greenhouse gas emission intensities associated with the local electricity generation. And power emergency events via web-based data distribution services such as MIDAS, which is the CEC's market informed demand automation server or other similar devices.

So under this proposed regulation, the devices must be capable of receiving data from the Internet and perform clock synchronization. We're hopeful, of course to do all that, the power that's quickly becoming available through pushes or pulls from MIDAS. But are you aware of any concerns about such a kind of connectivity requirement? For example, access for low-income households, cybersecurity, exposure of personal information etc.

And finally, just to conclude when we get to it, what are your thoughts on some of the next steps to be addressed?

MR. DELFORGE: I'm going to chime in first here. So first, I want to say that I think the approach that the CEC is proposing with having a default schedule and being connected ready is a really strong approach. It kind of echoes what was done with the heat pump water heaters with

Joint Appendix 13 of Title 24.

I think that one of the areas where this doesn't go far enough is in the connectivity requirements. I think that in order to realize the vision that you are pursuing here, which I think is the right vision of connected and responsive appliances, we need to have a strong foundation for these appliances to remain connected over their lifetime. And right now the majority of appliances are using wi-fi. It's cheap and convenient and it works well the first time you connect it. The problem with wi-fi is it doesn't stay connected very long. It doesn't stay connected because the pool control may not be within range of the router. The passwords and routers change regularly. Tenants change. Owners change. The likelihood that a wi-fi connected device is going to remain connected for its life is really low. I would not bet any money on that.

I think if we rely on Wi-fi for connectivity, on the fleet level, we're going to have very, very low connectivity rates. Even if all devices get connected at installation, it is going to go down, the connectivity rate is going to go down very quickly over the next few years. And we're not talking about a cell phone that people just change every two or three years, we're talking about devices that are supposed to last 10, 15, 20 years. And we need the device to remain connected over that time, not

just 2 or 3 years.

And to do that, I think we need to set a standard of open access at the device. So that whatever communication technology will be the winner of that flexible demand appliance connectivity in the next few years -- we know it's not wi-fi, we don't know which one it is yet. It might be cellular. It might be FM radio. It might be the next wi-fi, number seven or eight or whatever that is, we need the devices that are sold today to be upgradeable. Not to be stranded with current wi-fi, but to be upgradable to that device. And that requires some USB type device, or ports that just like we have, we plug in a USB dongle that does whatever on your laptop, you can do that on devices.

So that's the open standard that will also meet Jennifer's need, I think, to not necessarily ship that dongle or that connectivity everywhere. But to be able to add it where needed. And it will allow upgradability and will allow these devices to remain connected over their life. So I really strongly encourage the CEC to consider this as an enhancement to the current proposal. So that we are really talking of a fleet of devices that will be connectable over the life, and not just a couple years after installation.

MR. RICHARDSON: Okay, in that case, would you

actually call for that even today those devices still ship with some something plugged into that port that could be changed?

MR. DELFORGE: In California, I think that would be either it's in the box and you plug it in, or it's plugged in already. No, I don't have the details. But I think what's really important is to have that open access on the device. So I mentioned USB for laptops, everybody knows it, I think for flexibility demand appliances the emerging standard is CTA-2045. And I know it's not complete, there's still similar work happening and if that's normal. But requiring it is the best way to make sure that this work is finalized, but manufacturers get involved. And that we all settle on something that works.

And if we don't require it, then we're going to end up with a fleet of devices that have Wi-fi built in and are not future proofed.

MR. RICHARDSON: Yeah. Okay, so there was another comment from Geoff, in supporting Pierre's comments on wi-fi not staying connected long term, but not dongles. I guess it sounds like Pierre was speaking to that when he said it's not really just a connectivity port is the key thing that is standardized.

MS. ANDERSON: And what Pierre said, I don't know that there's anything that could be added. But I think

what he said is so important. This is so powerful if we can keep these products connected, and continuing to be a powerful resource for the grid. And also an amazing opportunity for customers to maintain their utility bills at a specific rate, so they don't have to spend more than necessary. That's so important.

COMMISSIONER MCALLISTER: Hey, everyone, this is Commissioner McAlister. I want to just chime in here. I agree. This is a fundamental, just foundational super important part of this conversation. And, you know, I think so Pierre, so you mentioned -- there's discussion going on, there's not quite consensus. And I agree it's a conversation we need to have. It's vital that we have it.

I guess, you know, in the broad scheme of things not just with pool controls, but also water heaters say and other devices that are coming down this path here presently, I'm a little concerned. So we're a regulatory body, we're a standards-making body at the Energy Commission. We do that well. I think we run the processes well. And we would do so, we will do so here as well.

You know, in this case we're kind of leaving the controls methods. And so in this proposal right now as it stands, we're leaving the kind of comm and controls and methods and details to the manufacturers. I wonder if any of you have sort of further comments on this trade-off

between a highly detailed standard that could include even a port like a CTA-2045 or some hardware as well as an and/or a communications protocol like Open ADR or another one. Or a communications protocol, and then sort of a dispatch protocol, if you will. Like we could dictate those things.

I guess I'm wanting to kind of hear further insight about the trade-off between kind of that approach, which is sort of a heavier regulatory approach. And one that does leave the kind of development of the specifics to the manufacturers. And I see the attractiveness of that latter approach, but I also kind of worry that it could make the dispatch, the implementation more diffuse and less predictable. And kind of get us wrapped around some proprietary approaches that may be counterproductive.

So I want to know, I guess I want to hear sort of how big of a risk or you know how we achieve that balance? How big of a risk that scenario might be?

MS. HATFIELD: Well, this is Jen from the Pool and Hot Tub Alliance. Sorry, I can't be on the screen with you all today. I'm out of the country doing this, so this is a more reliable way to call in.

COMMISSIONER MCALLISTER: Thank you for being here. That's fantastic. We appreciate it.

MS. HATFIELD: No worries.

No, I would say that it is a tough dilemma that you're in. I would note from the manufacturers industry standpoint you don't want to stifle innovation right, by being too narrow. And narrowing it down to a single standard and being too specific, because that could actually decrease future energy savings and innovation that the industry can do. But also maybe you don't want it to be too broad and too specific as well.

You know, I think finding that middle approach is probably what's most practical for our industry and our members. You know, existing API system can be made compatible to open ADR protocol. But it's going to definitely require significant investment by manufacturers to do that.

And I think that's the other side of the thing, that depending on which way you go. There may need to be more time allowance. I know that you guys are eager to get this first one out the door. And the effective date is right now proposed for January 1, 2024. But I mean, we think we need more time to also address this and make sure we're actually going to be able to put the investment into follow whatever the final proposal is. So I would just caution not being too prescriptive. You don't want to stifle innovation long term.

MS. ANDERSON: So one of the things that I -- oh,

go ahead, Pierre.

MR. DELFORGE: After you, Mary.

MS. ANDERSON: So I absolutely agree. And so I worry about it being too prescriptive. But I do believe there's a lot of power in having the CEC involved. They are able to push movements where other parties cannot. And so even if the CEC doesn't mandate it, I think having the CEC staff involved is so powerful and engaged in a productive manner to help all the parties come to a consensus.

Yeah, I can't -- there's no way to underline how important the CEC staff is coming to an agreement for all the parties.

MR. DELFORGE: Yeah, I would add to that, that I agree this is the right question. What is the trade-off between being too prescriptive and not enough? And I my sense is, at the moment, the requirement of just TCP/IP is just not prescriptive enough just to fall on the other side.

And standards need some pull from regulation. I think once the standard is required, you're going to see a lot more traction from the industry to develop it, to adopt just like I think Geoff Wickes mentioned, and I think Tristan as well, a standard set of commands. I mentioned an open standard physical access at the device, those are

going to need to be required if we want to get them adopted. I think voluntary is not in the lead there. It doesn't mean they have to be exclusive. It doesn't prescribe or preclude wi-fi on the device, built into the device, or some other type of connectivity. But it provides a minimum standard that guarantees access, long-term access to the device, and long term interoperability.

So I think, to me, that's the minimum standard that we should build on. And then if manufacturers want to do something else, it doesn't prevent them from doing so. It's just a starting point, so a foundation.

MR. RICHARDSON: I do want to pick that apart though. So there's the connectivity issue, how you get access to the device, and then how you control it. And those are not necessarily the same thing, and I don't know how much they can be divorced or not.

MR. HELFT: If I could just mention something on behalf of staff, early on when we were working on the draft of these standards, we reached out quite a bit to our friends in Australia that do have a set of commands. And we were headed in that kind of a direction, but then realized that we have to get something to start with. And this is our first iteration of the standards for flexible demand. We wanted to get something out to the public and in the works and can certainly be revisited and updated as

time goes on.

So take it for what it is at this stage. And it's a work in progress to be improved. Commissioner?

COMMISSIONER MCALLISTER: Yeah, Bruce. I just have one other, I guess so this particular one, just along the lines of what Bruce just outlined. This is a little bit of a light touch, relatively simple to what's coming. We're going to have to think about test procedures. Maybe in this one if we revise it in that direction, but certainly in future device categories. Any thoughts about -- I mean, you know, that'll be a future conversation, but I just how big of a concern. I mean, as far as I know that's pretty open landscape. So we'll need to develop some test procedures. Any thoughts about that?

MS. ANDERSON: I can say that the IOUs look forward to supporting that with the resources that we have and working alongside all of the important stakeholders that are willing. Because we agree that there's a lot of effort that needs to be taken to be able to get a test procedure that can be adopted by the manufacturers.

MR. HELFT: So if we could advance to the next slide, please?

COMMISSIONER MCALLISTER: Thanks, Bruce. I'm going to let you move on, so thanks a lot.

And I really appreciate the panelists. Your

thoughtfulness and yeah, just your engagement here, your positive engagement and encouragement really. I think we're all in agreement that this is important work. And I'm really looking forward to working with all of you and all the stakeholders and staff to move this forward. So thank you.

MR. HELFT: And I want to thank Mary, Jennifer, Pierre and Henry, for your involvement, as well as Daniel Buch in speaking today. Thank you again.

We're going to move on just to keep a watch of the time here. For public comments I'm going to turn this over to our friend, Nich Struven.

MR. STRUVEN: Yeah, thank you. I just wanted to check and see if the court reporter needs a break before we begin our comments.

COURT REPORTER: I'm fine.

MR. STRUVEN: Okay, this is a public hearing being recorded by a court reporter and all statements today become part of the public record.

Just a few housekeeping rules. All attendees are muted. If you have questions, you may type them into the question and answer function like we've been doing. Be sure to include your name and affiliation, and they'll be forwarded to the moderator. If on the phone, raise your hand to speak by pushing *9 and the host will give you the

ability to speak. And then you can push *6 to mute and unmute. We can keep the comments to three minutes per person and one person for organization. If we have a little extra time, it could go a little longer. Please state your name and affiliation when speaking.

So let's first go to the -- let’s see if there's any raised hands. And I think we do.

Okay, at the top of my list I see it says “SkyCentrics, Tristan.” I think you have the ability to unmute.

MR. DE FRONDEVILLE: Yep, I'm on there.

MR. STRUVEN: Great. Go ahead, state your name and affiliation.

MR. DE FRONDEVILLE: Hi, my name is Tristan de Frondeville. I'm the CEO of SkyCentrics. SkyCentrics has been tasked with making a testing procedure for UL and Intertek. And UL and Intertek are -- for CTA-2045, UL and Intertek are already testing water heater products to be certified as CTA-2045, something called -B Level 2. Level 2 was created so that water heaters in particular, would have standard commands that they could respond to, that a utility could rely on for that water heater responding.

So just to show you how far along the standard is, I think the comments from all the participants about the need for a port, and how it would be incredibly

efficient as a way of future proofing, providing communication path flexibility, I'd like to say one story. An RFP for a water heater load controller came out of the Midwest, and they wanted a cellular connectivity and a CTA port. And I was surprised. I asked them, "Why do you want cellular connectivity, I mean a CTA port if you already have cellular connectivity? Add the CTA port's been branded the Eco port, by the way. Ecological or economical, it's good brand.

And they said, "Well, because someday in 10 years, we think 30-year life cycles for these, and in 10 years the 5G may be deprecated and not able to work anymore. And we want to be able to just mail people a 9G cellular module that they can plug into the port." Which is a great story about the future proofing capability.

So the standard is much further along than one thinks. It's inexpensive for manufacturers to put it in, especially if they already have a CPU brain that is scheduling things it's easy for them to put it in.

And finally, if you need Open ADR, you can add it. And we've seen historically that the module makers can be much more flexible about updating the firmware over the Internet and creating new features than the OEMs. But the OEMs responding to the three levels of shed and the two levels of load up already provide a lot of flexibility and

value in terms of maintaining customer comfort. I'm talking about the water heater side, etc. So super flexible, super innovative, and thank you for your time.

MR. STRUVEN: All right. Next up, I see Geoff and it looks like you have the ability to speak. Go ahead and state your name and affiliation.

MR. WICKES: Great and thank you for the opportunity. This is Geoff Wickes with NEEA Emerging Tech area. And I've worked extensively in deep areas of water heating and connected water heating, especially in California as well. And I want to say that some of the topics that were brought up today were very helpful. And some of the work has already been done with the connected water heater world that would help address and create a pathway for this.

For example, in the Advanced Water Heating Initiative, we created two paths: one for the manufacturer and then one was CTA-2045.

I'd also point out that AHRI 1430 Standard is currently in the final stages of being developed for controlling water heaters, both electric resistance and heat pumps. And that technology and that work could also easily be borrowed from.

I would also say EPRI is developing, and they were the originators of the CTA-2045 with the Consumer

Technology Association. They're also building a reference design kit, so that the barrier to entry into controllability for the manufacturer is really minimized.

I also wanted to remind a story that I often tell that Commissioner McAllister, I think was about three or four years ago, made in a public statement of we don't want any dongle-itis going on. So just to remind you, Mr. McAllister, that you requested no dongles and we heard you. And we delivered CTA-2045.

Thank you for the opportunity.

COMMISSIONER MCALLISTER: I wanted to just thank you for that comment. And I appreciate your taking it to heart. You know, God forbid we end up with a drawer full of water heater dongles.

But seriously, I want to just highlight the Advanced Water Heating Initiative as a really great arena for talking about many of these issues, but a lot of informed people and with the backing of the Department of Energy. And so that's really, I think, a powerful forum. And I co-chair that and it's been a -- it continues to be, and it is a really good forum. So we're definitely listening to that as well.

MR. STRUVEN: I don't see any more hands raised at this moment -- oh, wait.

MR. NORDMAN: So this is Bruce Nordman. Can you

hear me?

MR. STRUVEN: Go ahead, Bruce.

MR. NORDMAN: Yeah, I raised my hand. I was unmuted.

Yeah, Bruce Nordman, Lawrence Berkeley National Laboratory. I think it would be very -- so the document that was released covers two fairly distinct topics. One is the communication strategy, and architecture. And the second is the particular implications for pool pumps, and it would really be helpful for everybody to separate those two into two documents and two processes. Because the connectivity strategy will be mostly universal across all in building devices. And there's really should be nothing specific about pool pumps, except things like the observations that they often can be far from like a wi-fi router.

But in general, most of it is generic to all devices. And there really should be a broad base discussion and consensus on that amongst people interested in all devices. And then a separate process for understanding the implications for pool pumps, specifically which this document, I think, does a good job of.

And some aspects that should be in that generic communications architecture document is some basic principles that can be adopted. One example could be that

the device should be fully capable of local operation without Internet connectivity, because sometimes you don't have it. And sometimes you have it, but then it fails. And so it's essential that -- and also, even if you have Internet connectivity, then you can be hostage to a particular cloud vendor. And you really want to make sure that customers have the option to be fully local and resilient for their own operation.

And it also, it's essential to identify more than one pathway, because I think it's clearly reasonable for some pool pump controllers to have the communication built in, like with IP connectivity, but I think the CTA-2045 path has an important role to also play.

And then there's the question of where is the intelligence to translate price to functional control? And that might reasonably be either in the device itself, or in a CTA-2045 module. I think the standard should support both, but they have to clearly articulate the implications of which path a particular product takes.

And then finally, it's critically important to understand the time dimension of this, because Open ADR is referenced. But Open ADR, there's a process to update it, to modernize it, to make it much more suitable for this type of application. And it'd be great if these standards would go into effect in the timeframe that is consistent

with that updating process, so that it can reference the new version of the standard rather than the old one. And the new one will be much simpler, and much less onerous for manufacturers to include. Thank you.

MR. STRUVEN: It looks like we have another raised hand. Angela, go ahead and state your name and affiliation.

MS. CHUANG: Hi, I'm Angela Chuang from EPRI. And I'd like to mention, although there's lots of good discussion already on connectivity, I'd like to talk about the potential impact of the default schedules on system operations. And better understand to what extent that has been investigated.

We're coming to a close on a multi-year project called Flexible Pool Pumps that involved in forming standards. And this is the ENERGY STAR connected pool pump standards. As well as informing the standard through our laboratory and building investigation.

And if you look at the evolution of the ENERGY STAR connected spec for pool pumps, originally they did have a hard coded default schedule, but for the peak load reduction type of response. And now there isn't a hard code after a process of commentary from the industry across the nation, including utilities with pool pump devices that are involved in demand response, to be able to learn from that

perspective, too.

And if the Commission is short on time, I'd like to offer to help through my project, gather that perspective if the Commission feels that this question has room to be investigated. The potential impact of default schedules on system operations surrounding my Q&A comment.

During peak flow days when solar power unexpectedly isn't available, the default schedules could exasperate a supply shortage condition, and contribute to a supply shortage issue. So getting the operator perspective, it may be very prudent to the extent that hasn't been gathered as much as the Commission would like.

MR. STRUVEN: Okay, thank you.

I see another hand raised. Philip, go ahead and state your name and affiliation.

MR. ESCOBEDO: Hi, I'm Philip Escobedo with Fluidra, a manufacturer of pool products. I had a specific question on Table 5.1 of the draft reports that shows in-scope devices and out-of-scope devices.

On the out-of-scope devices list, it showed integral pool pump controls on pool filter pumps and integral pool filter pool pump controls on replacement pool pump motors. And these are classically onboard controls for pool pumps with a UI, you can set your schedules and times and etc. So will those be completely out of the

scope of this regulation as far as the need for default scheduling on those particular devices?

MR. STRUVEN: I have to look at that a little bit more. It's probably something that we can discuss later to see if there's some changes need to be made. It kind of goes back to the definition of is, you know the -- where the control is. So that's something we'll have to look at. I don't have an answer for it immediately right now.

MR. ESCOBEDO: Okay.

MR. STRUVEN: I don't see any other hands up? Is there somebody else that has a question or a comment that doesn't have their hand raised they would like to ask.

MR. RICHARDSON: I actually raised my hand. This is Henry Richardson from WattTime, one of the previous panelists. I just want to reiterate my enthusiasm for the paradigm shift away from point in time and limited demand response, load management to continuous load management, that is a major innovation that I don't think is present in many other proceedings currently. Or that shift in mindset.

MR. STRUVEN: I don't see any other comments right now, but we can pause for a few more minutes. And if there's none, then we can proceed on to our concluding remarks if there's no more comments. I see Tristan with his hand raised. Go ahead, Tristan.

MR. DE FRONDVILLE: Yes, I know I've commented already, but just one brief comment on Commissioner McAllister's comment on being prescriptive to the OEMs versus giving the OEMs the choice of how to implement.

So the water heater industry is about five years ahead of the pool pump industry and went through exactly those issues. And Washington and Oregon two years ago put -- or Washington first put a flag in the ground of requiring the CTA port in every new water heater sold in Washington, and Oregon joined it. And it only took one state and now every water heater OEM is going to have the port in 2023. And they're going to ship it to every state in the union, which is radically transforming the water heater industry and the options for future management and everything that we've talked about.

So just in terms of encouraging this. And by the way, there was 10 years of the OEMs just sitting around the watering hole saying you go first, no you go first. And then the one state broke it open. I just want to encourage that knowledge. Thanks.

MR. STRUVEN: Are there any other comments? I don't see any raised hands right now. Just one last call for any questions, comments? You can go again if you have a second one, just raise your hand. Go ahead, Geoff.

MR. WICKES: Thank you, Geoff Wickes, NEEA

Emerging Technology. We would be very happy -- even though we only have 300,000 pools in the Pacific Northwest, we'd be very happy to help with this. And I realize California's second in the nation as far as pool count numbers, but happy to help where we can in moving forward a standard that all manufacturers and then eventually all states could adopt.

MR. STRUVEN: We appreciate the kind offer. Thank you.

Any other last hand raises? (No audible response.) Okay, well seeing no other hand raises, I just want to remind you that you do have the opportunity to make a comment in the dockets. Or reach out to us to our contact information on the Flexible Demand Appliance Standards webpage at the CEC.

Okay, the time is (indiscernible). Geoff, did you have some other comment? I just heard --

All right, I'll continue on. The time is 11:23. We're approaching the close of the workshop. And so now what I'd like to do is introduce the Flexible Demand Standards Team Electrical Engineer to provide some concluding remarks and next steps. Welcome, Ho.

MR. HWANG: Hello, my name is Ho Hwang, and I am an Electrical Engineer on the FDAS Team. Today staff introduced the draft staff report and the proposed

regulatory language for Flexible Demand Appliance Standards. The Flexible Demand Appliance Standards plays an important role in achieving California's ambitious goals to decarbonize California's energy, transportation and building sectors. Consumer savings on electricity bills, electricity, grid reliability and improved air quality.

The staff values your input highly. Today was the draft staff report workshop to request comments from the public. Staff will review and respond to comments received today and through August 31st. Stakeholders are encouraged to sign up for the Flexible Demand for Appliances list server to receive updates and notices on this topic. Note that this is a multipurpose list that serves the flexible demand appliances and load management and demand response activities at the Commission.

The table shows approximate dates from key milestones for the pre-rulemaking and rulemaking schedules. Staff plans to recommend to the CEC for adoption, the first Flexible Demand Appliance Standards in the first quarter of 2023 with the effective date for compliance one year after adoption.

Thank you for your comments today. Please submit your comments in one of these three ways before 5:00 p.m. August 31st, 2022. We welcome your comments. Thank you.

(The workshop was adjourned at 11:26 a.m.)

CERTIFICATE OF REPORTER

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

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

IN WITNESS WHEREOF, I have hereunto set my hand this 3rd day of August, 2022.

Elise Hicks

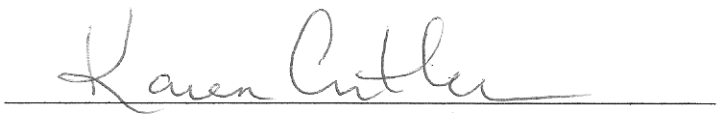
ELISE HICKS, IAPRT CERT**2176

TRANSCRIBER'S CERTIFICATE

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

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

IN WITNESS WHEREOF, I have hereunto set my hand this 3rd day of August, 2022.



Karen Cutler
Certified Transcriber
AAERT No. CET**D-1424