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CALIFORNIA ENERGY COMMISSION

In the matter of:

2022 Rulemaking for Part 11 (CALGreen) and Parts 2-5 of the Building Standards Code	))))	Docket No. 21-BSTD-03

LEAD COMMISSIONER HEARING

REMOTE VIA ZOOM

FRIDAY, AUGUST 6, 2021

9:00 A.M.

REPORTED BY:
Elise Hicks

APPEARANCES

LEAD COMMISSIONER

Andrew McAllister

CEC STAFF

Payam Bozorgchami, Building Standards Office

Danuta Drozdowicz, Building Standards Office

Peter Strait, Building Standards Office

Danny Tam, Building Standards Office

P R O C E E D I N G S

9:05 A.M.

MR. BOZORGCHAMI: Good morning everybody, we'll start about 9:05, just to allow everyone to sign on. Thank you.

Good morning, everyone. Just one more time – we'll start in about two minutes and just to make sure everyone's situated properly. Thank you.

So, I think we should start. Hi everyone, good morning. My name is Payam Bozorgchami, Project Manager of the 2022 Building Energy Efficiency Standards. I want to welcome you to the Energy Commission's Virtual Lead Commissioner Hearings for the upcoming CALGreen Code.

The Lead Commissioner overseeing the work that's being done for the 2022 CalEnergy Code is Commissioner Andrew McAllister.

This hearing is a second hearing on the 45-day express terms where we would like to receive your feedback from you regarding what Energy Commission staff is proposing for Part 11, and the minor editorials that we've down for Parts 2, 2.5, 3, 4 and 5 of Title 24.

In this hearing, staff will be presenting what they already presented at the first Lead Commissioner Hearing which was held on July 27th. It's the exact same slides.

During the hearings on -- that was held on July 27th, we noticed a lack of participation, and because we really value your comments, it was decided to have a second hearing.

Also, in these hearings, we will not be discussing the

Environmental Impact Reports for Part 6 that was recently posted.

So, with that, let's start first with some housekeeping rules, and this is what we have to do every time. We will be meeting everyone and after each proposed subchapter is presented, you can either raise your hand and we will unmute you, or you can submit your questions in the Q&A window. And we have a group of panelists who will try to answer your question as they come in.

Also, if you're participating by phone (I see a few people are doing so), you can use *9 to raise your hand and *6 to mute and unmute yourself.

And when we do unmute you, please state your name and who you're affiliated with. This workshop is being recorded and it will be transcribed. And by stating your name and affiliation, we can figure out who we need to reach out for further discussion if there's one needed.

Also, for this workshop, we're going to be implementing the three-minute rule. I don't think that we will have to reduce that three-minute rule any further than that. But for now, we'll just stick to the three minutes and see what happens.

But before we start, Commissioner McAllister would you like to give a few words?

COMMISSIONER MCALLISTER: Yes, please. Thank you. I want to go ahead and just thank you. As we get started and kick this off, thank you and the team, Building Standards Office and the Efficiency Division leadership for really putting together, I think a great

package. I think it's simple, straightforward, it's elegant. It's a clear and intentional extension of what we're doing this cycle for Part 6.

And so, I think in that way, it makes a lot of sense. It projects a clear direction that we're going in, going forward. And those repeating, but most of you on the call will know that Part 11 is typically functions in the marketplace as an extension or sort of a projection of where we're going with the Building Code and feature cycles, and gives local governments and others some confidence I think of directions or measures that they can take, including just adopting what's here or something related to it or similar to it, going forward to kind of get ahead of where the Building Code will likely go in the future.

So, that is the intention here. Again, Part 6 is voluntary. It's out there, it's not mandating anything to anyone, but it is sort of getting ahead a little bit of where the marketplace is going and where buildings will likely to go in the future.

So, this is a simple package. I think those of you who have not had a chance to look at it yet (hopefully most of you have), but it is simple and pretty straightforward. There's quite a bit of a sort of administrative and sort of ministerial pieces to this as well. But the core proposition that you'll see in Part 11 is pretty straightforward, and I think it’s relatively easy to understand for folks that are familiar with the Building Code.

So, in any case, one of our staff will run the show here, but

certainly, absolutely, welcome everyone's comments. The last workshop was a little underwhelming because I think some folks didn't know that it was going to happen. And so, I really wanted to just make sure that we had a proper hearing as much as we can to get everyone in the room to have a look at this and have a little back and forth with the commission team and get your input on it as we go forward.

So, that is the intention here. And again, thanks everyone for being here and looking forward to a good morning.

Thanks -- back to you, Payam, to kick us off.

MR. BOZORGCHAMI: Thank you, Commissioner. So, what will we be covering today for Part 11? We are going to talk about the sections that we are making proposed edits for this code cycle, and there's parts of Title 24 that we have pointers that refer back to the Energy Code and we will have discussion on that too.

But with that as we always do, we have to start with a quick history of how this all started and how CALGreen started.

So, as you all know, two California Assemblymen, Charles Warren and Al Alquist, coauthored what is known today as the Warren-Alquist Act. This Act gives authority to the Energy Commission to develop the Energy Code on a triennial basis and local jurisdictions to enforce the Energy Code through the building permit process.

The Energy Code is developed to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy. This Act was signed in 1974 by Governor Ronald Reagan, and in 1975, the first group of commissioners, the first five commissioners were

approved and what they did was they set up to meet …

And I apologize, I'm blanking out.

The five commissioners at the commission immediately set out to meet their extensive mandates of the Warren-Alquist Act to include the adoption of the first Building Energy Efficiency Standards that went into effect in 1978.

I apologize for that.

The benefits of the California Energy Code, that California has been a national leader in energy efficiencies since the late 1970s, with the appliance and the building standards saving consumers more than a hundred billion dollars in utility bills.

So, with that later on the, the California Green Code came about in 2007, the California Building Standards Commission was directed to develop the Green Building Standards, which was the first in the nation in an effort to meet the requirements of Assembly Bill 32, which is known as the California Global Warming Solutions Act.

This Act requires us to reduce the greenhouse gas down to 1990 levels by 2020. Notable AB32 scoping plan identified the buildings as the second largest greenhouse gas emission producers.

Subsequent to AB32 in 2008, Senate Bill 1473 gave the California Building Standards Commission the authority to develop the Green Standards for occupancies where no other state agency has the authority to adopt the Green Building Standards.

The first CALGreen Code was published in 2008 and implemented in August of 2009 as a voluntary set of standards.

CALGreen is then divided into five divisions and the Energy Standards is part of division two.

Also, in 2010, the residential, non-residential volunteer requirements were separated to reduce the confusion. As you know, there's a voluntary section for A4 for residential and A5 for commercial building or non-residential.

So, when it comes to the CALGreen, since California Energy Commission is the authority in developing and adopting the voluntary energy provisions of the Energy Code, we're having these hearings and later on, we will have an adoption of what we're proposing today.

As you can see, attached is a schedule of the codes from now to the effective date. We posted the 45-day language for people to review for Part 6 and Parts 2, 2.5, 3, 4 and 5 on July 2nd of 2021. And the comments are due by August 16th. And this gives us enough time to be able to analyze any comments that we receive and develop the package for Part 11 that we will be going to a special business meeting on September 30th for adoption.

And we'll be submitting these adopted languages to the Building Standards Commission, and the Building Standards Commission is scheduled to approve these documents on December 14th to the 16th. We're not sure exactly which of those three days that will be, but it will be within that time schedule. And again, the effective date is going to be on January 1st, 2023.

I just wanted to share with you the link, if you have any comments from today's workshop or any comments or concerns regarding

what's posted for the 45-day language, please submit them to 21-BSD-03. That's our docket for Part 11, and the comments are due by August 16th of 2021, which is 10 days from now.

There's another link here below. This is where you can find all the previous and the current CALGreen codes related to energy. You could find sections of Part 6, the building standards, the Energy Codes are there, the compliance manual, the compliance software is available for you. If you'd like to visit, you will find them in this second link here.

If you want to submit your comments in writing, we're no longer at 1516 9th Street, we moved on to 1715 P Street, into our new building. And we're not there in person, but our mail room has been transitioned there right now.

And again, you'll see this over and over this slide. And comments are due by August 16th from today's hearing and also from the 45-day language.

So, with that, I'm going to pass the baton off to my colleague, Danuta, who will introduce herself, and Danny Tam, to present on the proposed changes for Part 11. Thank you.

Danuta?

MS. DROZDOWICZ: Thank you. Good morning. My name is Danuta Drozdowicz, and I work in the Building Standards Office of the Energy Commission's Efficiency Department, and I'm here with my colleague, Danny Tam, to present an overview of the changes that we propose for Part 11 of the California Building Code.

Next slide, please.

As Payam has explained, CALGreen is a voluntary code that contains a full spectrum of Green Building Standards, among them, energy standards that both meet and exceed Part 6, the California Energy Code.

For local jurisdictions that choose to adopt CALGreen, there are both mandatory and voluntary standards throughout the Code. For energy, the mandatory requirement is to meet the current Energy Code.

Voluntary standards, on the other hand, typically exceed the code and often include requirements that may be cost-effective in future code cycles.

CEC is responsible for content and updates to the voluntary standards that are contained in CALGreen Appendices A4 which is the residential component, and A5, non-residential. They have no regulatory effect and local jurisdictions that adopt CALGreen are not obliged to use them.

For 2022, CEC has proposed changes only to A4 the residential appendix.

Next slide, please.

To develop these changes, the CEC worked with our stakeholders, and in the process received one comprehensive proposal from the Codes and Standards Enforcement or CASE Initiative. The report is docketed on the CEC's website.

In addition to the updates to the Energy Design Rating that Danny will explain, we selected four of the measures recommended in

the CASE report, as changes to the 2022 CALGreen.

Next slide, please.

Jurisdictions that decide to adopt CALGreen Voluntary Energy Standards are choosing to meet the Energy Design Ratings for their Climate Zone and in addition, one prerequisite option is to be selected.

For 2022, we have added four options to the four existing options that we see here on the slide and that are in the 2019 code.

The new options are high performance vertical fenestration, heat pump water heater demand management, battery storage system controls, and heat pump space and water heating. I'm happy to answer any questions that you have, but please hold them until the end of this presentation.

I am now pleased to introduce Danny Tam who will discuss the changes proposed for the Energy Design Ratings. Thank you.

MR. TAM: Hi, I'm Danny Tam, CEC staff. I'll be presenting the changes in Energy Design Rating or EDR.

Next slide please.

So, the EDR targets in Part 11 are voluntary reach performance targets to go beyond the minimum requirement in Part 6. There are some major updates to Part 6 in 2022, or which the most significant changes, is that the installation of either heat pump space heating, or heat pump water heating is the proposed prescriptive requirement. This is why it is necessary for us to update the EDR targets to reflect these changes.

CEC staff did extensive analysis to come up with these proposed targets and in particular, Mazi Shirakh, did most of the heavy lifting.

So, a little bit of history for 2019 and Part 11, there was separate targets for Tier 1 and Tier 2. To set the target in 2019, we started with a mixed-fuel house and added a 14-kilowatt-hour battery for Tier 1. And for Tier 2, we added some additional PV, as well.

For 2022, we're proposing to have a single EDR target instead of two for simplification and also, to make it easier for jurisdictions to adopt Tier 2.

Another change is that the proposed margins are in EDR1, which is based on hourly source energy. EDR1 is a new metric that we introduced in 2022 for Part 6. Before, we used time dependent valuation or TDV. TDV still works well for our purposes, and we're still using it in Part 6 as EDR2 together with EDR1.

Since our goal for the cycle is to promote high efficiency heat pump technologies, we believe hourly source energy is a better metric for Part 11.

Next slide.

So, there's a lot of information here. We'll go through it slowly. So, this is a table that shows the proposed EDR margins and some examples of how to meet it for either the heat pump or mixed-fuel compliance path.

On the second columns are the targets below the requirement in Part 6. So, this is a change from 2019 where the requirement's an

absolute target you have to hit. So, for 2022, these numbers represent the improvement form Part 6.

So, for example, let's say for Climate Zone 12, the required margin is 4.4. So, that means let's say, your Part 6 requirement is X for EDR1, you have to go 4.4 below that to meet Part 11.

And just to be clear, these examples are not the only way to meet these targets. Since these are performance target, you can meet them with other measures such as better insulations or better windows.

Let's start with the heat pump compliance path. If you have both heat pump space heater and water heater, they'll basically meet the Part 11 EDR target in most of the Climate Zones. For the milder Climate Zones, you might have to add a little extra such as compact hot water distribution, or you can do an electric cooktop.

For Climate Zone 15, this is the Palm Spring desert with very high cooling load and low heating load. So, you have to do something more such as triple pane windows or an electric cooktop.

And on the far-right column, this is the mixed-fuel column where first of all, we're basing this example on what I call a double-mixed fuel, meaning minimum efficiency furnace, and minimum inefficiency instantaneous gas water heater.

What we found is that dual-fuel heat pump and triple pane windows works great for any Climate Zone that has high heating load, such as Climate Zone 1, 2 and 16. Dual-fuel heat pump also work fairly well for Climate Zone 11, 12, 13, where there's still some significant heating load.

For the rest of the Climate Zones, the easiest way to meet Part 11 if you're a mixed-fuel would be to add a five-kilowatt-hour battery.

And also, as a side note, battery storage will meet the Part 11 requirements for all the Climate Zones in either heat pump of mixed-fuel compliance path.

Next slide.

I think that's all I have. Now, we're opening up for questions.

MR. BOZORGCHAMI: I do see that there was one question submitted into the Q&A box. Drew Johnstone asks; is this the first-time cooktops are included in CALGreen compliance?

MR. TAM: I can try that. You can always model electrical top in CBECC but it would be the first time offers the EDR compliance credit, the EDR1.

MR. SHIRAKH: Yeah, this is Mazi Shirakh, CEC staff. So, the cooktop is an option available through the performance path. It's not actually part of the baseline, but it's like many other measures. Like you have better windows or more attic insulation or rooftop, roof deck insulation.

It's another measure that builders can choose to meet the EDR targets. So, it's not by itself in the baseline for Part 11.

MR. BOZORGCHAMI: This is Payam -- so, Mazi, you could do that through the performance package, correct?

MR. SHIRAKH: Yes, through the performance package you can

model in the future to meet the performance targets that Danny just showed. And so, an electric cooktop is just one option.

MR. BOZORGCHAMI: Thank you, Mazi.

COMMISSIONER MCALLISTER: This is Andrew, this is Commissioner McAllister. While we're asking people for questions, I think this is something we really ought to dwell on and just give people a chance to look at the table. So, maybe you can go back to the table.

MR. BOZORGCHAMI: Sure.

COMMISSIONER MCALLISTER: Because this really is the core of the Part 11 update for this year. So, this table, obviously, as Danny said, it's not all the ways that you can comply to these two paths, but maybe just at a 30,000-foot level, the EDR1 is source energy and it does map very closely on to emissions, on to climate emissions, on the carbon dioxide emissions.

And so, we know that many local governments, for example, are looking for ways to reduce their emissions, they have to climate planning and Part 11 is one place they look for instruments in order to be able to do that.

And so, this results in aggressive efficiency being the easiest path to reduce emissions and in particular, efficient electric end uses like heat pumps primarily, among them heat pumps are the basis for those examples in the heat pump compliance path. So, that is an easy way to reduce EDR1. Given the sort of evolution of our electric system going forward, that's clearly a path to reduce

emissions.

Reducing emissions in a dual-fuel home means that you have to really attack the onsite emissions and go very efficient on the gas side. Likely, the minimum compliance is sort of there, based on minimum compliance space and water heating. But reducing emissions further takes some doing in a mixed-fuel setting, but it is actually doable in every Climate Zone.

So, battery is a little bit the easiest pathway but there are other pathways to comply in the dual-fuel setting. So, it does take some creative thinking and a little bit of investment in … greater than minimal equipment is going to make that easier. Greater than minimum efficiency equipment is going to make that easier and/or a battery, but there are various pathways on the mixed-fuel compliance path as well.

But the idea here is to really reduce emissions, whether it's through fuel substitution, via heat pumps, et cetera, or via some relatively aggressive muscular measures on the dual-fuel side. But the end result in both cases is to reduce emissions significantly beyond the Part 6.

So, I just wanted to kind of unpack that a little bit. Not sure if I've helped, but that's the intent here. And local governments, I think can look to this to make some sense out of where they need to take their buildings.

MR. BOZORGCHAMI: Thank you, commissioner. Peter?

MR. STRAIT: Sure. So, Pierre Delforge from NRDC asks; are

electric cooktops also a compliance credit in Part 6?

MR. SHIRAKH: So, when you add an electric cooktop, you will get an EDR1 credit, which is source energy, but you also you'll take a hit on EDR2, which is TDV.

So, that is available through the performance path for both Part 6 and 11. But again, even though it helps EDR1 source energy, it does have a penalty on TDV side. So, the builder will have to do something extra to basically compensate for the TDV penalty. But it is available for both Part 6 and 11, just like any other measure.

MR. STRAIT: Next, Sean Armstrong asks; what are your thoughts about regulating the efficiency or fuel use of a swimming pool? And I can speak to this if folks would want.

MR. BOZORGCHAMI: Go ahead, Peter.

MR. STRAIT: Sure. So, there are already appliance efficiency standards for pool pumps and pool pump motors. So, those all are already regulated both under Title 20's appliance efficiency regulations and under a federal regulation. So, the appliance standards are doing the lift on the pool pump side.

MR. BOZORGCHAMI: Thank you, Peter. And then we have Chris Kuch; Danny, can you clarify what is a heat pump or Mazi?

MR. TAM: Yeah, just on the right column, for this analysis, we assume it's a minimum efficiency furnace and minimum efficiency instantaneous gas water heater.

MR. SHIRAKH: So, there's double heat pump and dual-fuel heat pump. I just want to make it clear -- double heat pump in the

middle column, that means that both end uses water and space heating is a heat pump.

Dual fuel heat pump on the other hand, basically, it's an air conditioning. It's a heat pump that does not use electric resistance. When the temperatures get really cold outside, it'll switch to natural gas furnace. So, they're two different things. I just wanted to point that out.

And under the examples of mixed-fuel, I think both Commissioner and Danny have mentioned, these are only one set of options. There are other options available to the performance path in many Climate Zones, including dual-fuel heat pumps in other Climate Zones. More energy efficiency through propane windows combined with other measures, as well as a slightly larger PV system. They can all help meeting these targets.

MR. BOZORGCHAMI: Peter?

MR. STRAIT: Next question is from Sean Armstrong. He's clarifying that rather than pool pump efficiency, he's curious about the heat pump versus gas boiler impacts of a pool heater on EDR1 and EDR2.

MR. SHIRAKH: So, pool is actually not a part of our standard design prescriptive. So, I don't know if -- Danny, do you know anything more than that? We don't include the swimming pool in our baseline calculations.

MR. TAM: Yeah, all the requirements are mandatory requirements. It's not part of the modeling.

MR. BOZORGCHAMI: Go ahead Peter.

MR. STRAIT: And I believe, I know there is some regulation regarding pooling equipment. But I don't know if it's an efficiency standard per se, or if it's the ban on standing pilot lights and that sort of standard. I'd have to go through the standards and find that out.

MR. TAM: It is in the mandatory section exactly … but yeah, it's mandatory.

COMMISSIONER MCALLISTER: And just to be clear, pools are not model-able in the CBECC?

MR. SHIRAKH: No.

MR. STRAIT: No.

COMMISSIONER MCALLISTER: Okay.

MR. TAM: The pools are – Commissioner, are mandatory measure requirements and then the performance is more of a trade-off situation.

COMMISSIONER MCALLISTER: Yeah, exactly. So, but there's no performance path that includes pools?

MR. TAM: No.

MR. SHIRAKH: No, I mean, most production homes, actually, most of them do not have a pool, so there's no reason to have them in the performance calculations and what requirements there are, they're mandatory requirements when there is a pool.

MR. STRAIT: Okay. Sean Armstrong is also asking; does using an electric stove require that it be modeled for EDR1 and EDR2,

or can it exist without being modeled.

MR. SHIRAKH: No, you don't have to model if you don't want to. There's a checkbox within CBECC. Under the appliances, if you do have an electric cooktop, you can switch to that or you cannot. I mean, it's up to you.

But again, because it is electric resistance in nature, it does have a slight source energy benefit, but there will be a TDV penalty. So, once you choose it, you have to leave with the consequences for both.

MR. STRAIT: And to add some detail to that, part of the reason is it is a checkbox in the software, is that a stove or a cooktop, much like a refrigerator does not need to be supplied with the building. It could be something that the person that's buying the building is expected to supply for themselves. So, we can't say in all cases that the builder is going to be installing a stove or a cooktop.

Or even for residential detached, I know that there are some rules about when a dwelling is created on the multifamily side.

MR. BOZORGCHAMI: Thanks. Thanks, Peter. I think we're done with the Q&A's. I'm going to transfer over to the raised hands participants on the phone. Bob, I'm going to unmute you. Go ahead and state your name and your affiliation.

MR. RAYMER: Thanks. This is Bob Raymer with the California Building Industry Association. And thank you guys for putting all this together. I've got a couple of questions.

First off, kind of taking off where Mazi was on the induction stove -- off the top of your head, for most Climate Zones, is the benefit on EDR1 outweighing the negative impact on EDR2? In essence, do you get a net benefit by using the induction stove?

MR. SHIRAKH: So, our current modeling is based on electric resistance cooktop. It's not induction; that's something we need to introduce into CBECC, an induction option.

My guess is that it will have a more significant EDR1 benefit. And I don't know at this point what the impact will be on EDR2. But Bob, the impact even for an electric resistance cooktop on EDR2 is pretty modest. It's less than one EDR point. So, it shouldn't be that difficult to overcome that.

And so, with the induction cooktop, it should probably be even easier.

MR. RAYMER: Yeah, that's really good to hear because once a builder goes with electric space and water heating, there's a good chance they're going to start thinking why have the gas line extension there? And while we still got a lot of buyers out there that just love gas, I suspect a great many of them love gas because they're not all that up to speed on newer electric appliances.

And so, I think once that … you'll see kind of a tipping point where once we get over that hurdle, you're probably gonna see people heading towards all electric. And having said that, we definitely like the idea of the four additions to the prerequisites that you've added here to the original four. That's very good,

particularly the battery.

And I realized the proceedings of the PUC are outside your control, but I suspect, I strongly suspect that once they finish up with the electric rate proceeding and the NEM-3 update, batteries are going to become vastly more popular, even though they're still very expensive -- that'll come down.

But I just have to believe that once NEM-3 and the electric rate proceeding get done and implemented, people are going to want to keep that solar power on site, as opposed to seeing it out there. So, anything you can do to help promote the batteries will be great.

And so, lastly, for your base packages, did you do a cost-effective analysis on this? I'm coming kind of late to the game and I haven't had a chance to review the case. And so, is what you've taken away -- Tier 1 and Tier 2, is the new Part 11 package that you've put together here cost-effective under today's utility rates?

MR. SHIRAKH: They are. For the efficiency measures, they are largely cost-effective. To batteries by themselves, cost-effective is marginal. In some Climate Zones, they are, in some Climate Zones, they're not. But if you add a little bit extra PV to the battery, which is not part of our baseline, then the batteries do become cost-effective.

MR. RAYMER: Wow.

MR. SHIRAKH: So, I mean, the combination of battery and PVs, they really work good, both from a functional perspective and from a financial.

So, again, we didn't require the extra PVs in our baseline. We're talking about a couple of panels, about 800 Watts. Once you add that, then it becomes cost-effective in almost every Climate Zone.

MR. RAYMER: A lot of good things, Mazi. Thanks, Payam.

MR. SHIRAKH: My pleasure. Thank you, Bob.

MR. BOZORGCHAMI: Thank you, Bob. Claire, I'm going to unmute. Go ahead and state your name and affiliation, please.

MS. CLAIRE: Hi, my name is Clair Warshaw, I'm a member of the public. I do not know a lot about the Code. Every now and then, I listen to it because it affects things and retrofits is something I'm very interested in, residential retrofits.

I recently had an upgrade to my heat pump and a large efficiency upgrade. And you might be aware of it -- SMUD **[inaudible 00:42:47]** extremely low incomes. And it's great, but I do want to mention something, I'm not sure if it's noticeable to anyone else.

I went from something like a SEER 11 to a SEER 16, and I know that that's not the best kind of thing to judge on because of our temperature here in Sacramento. But it is a large efficiency upgrade. And I noticed that the system goes on less often and for shorter amount of time, which is fantastic, but the home becomes extremely stuffy.

And so, something about circulation might matter and it may make a difference in your data too, because if you are judging solely on temperature differences and I have to, for instance, add the fan more just because the system is not going on as often. That may not be

in your data. I don't know if it is or not.

But I just wanted to mention that because it's so significant to notice. I, during the time of use rates, I try to turn up my thermostat and it's even much worse as you might imagine. I found myself wanting to go outside instead. It's more comfortable to be able to breathe.

So, just something to maybe … I don't know if that has been thought about, but I never noticed this before.

MR. SHIRAKH: So, I'll make an attempt. The cycling duration, how often the air conditioning comes up as a function of the size of the HVAC system that you have installed. And generally, it sounds like your system may be actually to be a little bit oversized. So, that's why it comes on and it cools down quickly and then it goes off.

A slightly smaller air conditioning system would stay on for a longer period of time with reduced off time. So, that is not a function of what we're presenting here. From a carbon emissions perspective, both systems essentially perform the same.

So, whether you have a little smaller system or larger, the carbon performance source energy would be practically the same. So yeah, I mean, I don't know what's causing your system to do that other than it may be a little bit oversized relative to your house loads.

MS. CLAIRE: Okay.

MR. BOZORGCHAMI: Thank you, Mazi.

MS. CLAIRE: Thank you, thank you.

MR. BOZORGCHAMI: Thank you Claire. Thank you.

I'm going to unmute you, Pierre. Go ahead and state your name and affiliation, please. Thank you.

MR. PIERRE: Yes, Pierre Delforge, NRDC, so thank you, Commissioner and staff. I don't know if it's the right time. I wanted to provide some general comments on Part 11.

MR. BOZORGCHAMI: Go ahead, it's perfect.

MR. PIERRE: Alright. So, I'm going to start by saying, we recognize that most of the staff time in this code cycle was spent on Part 6, and we strongly support the major improvements there from different baselines of energy efficiency in non-residential, new multifamily chapter; we think this was the right focus and prioritization of limited resources. Even if we wish that Part 11 could have been more comprehensive and particularly include multi-family and non-residential as well.

We do support the approach proposed by staff to have the four options and to set a compliance margin on source energy as a proxy for climate pollution. This is a good way to raise the bar in alignment with the state's decarbonization goals. And we appreciate the commission's focus on greenhouse gas emissions in Part 11.

Part 11 has an important role to play to help local governments adopt their local reach codes. Many of the 48 local governments that have so far adopted reach codes in the 2019 code cycle have gone beyond the commission's current proposal for Part 11. And we accept the will again, when they update their reach codes in

2022.

But we think that Part 11 is still important to provide all the local governments a simple and standard way to join the fray on reach codes and maybe adopt their first reach code in the next code cycle. And it's also a way to start the conversation for the 2025 code update as Commissioner McAllister noted, and this performance-based approach to decarbonization has merit in our view.

So, in summary, we support CEC's proposal and while it's limited in scope, we think it goes in the right direction and can have local governments accelerate their own transition of fossil fuels. Thank you.

MR. BOZORGCHAMI: Thank you, Pierre. Thank you very much. We have one raised from a phone number, please remember to *6, mute yourself and state your name and affiliation, thank you.

MR. MALINOWSKI: Thank you, Payam. My name is Michael Malinowski. I'm speaking today on behalf of the 11,000 design professional members of the American Institute of Architects California.

Our members are the architects of the built environment in our state and beyond. And in our work, we operate as business people, but as professionals, we take responsibility seriously as stewards of the built environment.

In light of their stewardship role, our 60-person board of directors announced a few days ago a formal declaration of climate emergency joining the nearly 2,000 other entities worldwide that have

acknowledged that we are at a critical tipping point and that bold decisive action is urgently necessary.

I'm here today to offer some general observations about the CALGreen Code, and I apologize that these comments are not directly related to the code change proposal in front of you, but I think this is an important opportunity and thank Commissioner McAllister and the CEC staff for providing platform for some discussion of CALGreen.

As you know and Commissioner McAllister personally knows based on his deep involvement and support, 18 months ago, AI California submitted a code change petition to bring to CALGreen a zero-carbon design framework to Appendix A5 as an optional measure for a large new commercial and multifamily buildings.

That is not on the agenda today, and we are disappointed that this modest move does not have a place in CALGreen's framework, but we will continue to work with CEC and other stakeholders. But I am here to talk about how our efforts have brought to light the disconnect between the current climate crisis that we all face, and the potential of CALGreen as a core means to move forward.

It's hard to imagine that it was only two years ago that the city of Berkeley's Electrification Reach Code made headlines around the world. There are now over 40 jurisdictions across California that have crafted their own unique green codes, which is a hopeful sign that there's a rising tide to make the changes necessary to urgently address the climbing climate crisis that is daily unfolding before our eyes.

It's also a sign that CALGreen itself has not evolved to serve as the aspirational forward-looking beacon that it was when it launched in 2008 as a revolutionary new way to look at how codes can shape the future.

It is unique in concept with a tier system that we believe is an ideal foundation for getting us ahead of the curve and anticipating and supporting rapid change necessary for de-carbonization and pervasive and equitable sustainability.

Instead, we observed that CALGreen has fallen far behind, and we know today, in fact, that three years from now, CALGreen will still not even have the term "embodied carbon" within its framework, even though we know by research, that it is critical to addressing climate change.

In fact, recent research shows that even the most efficient new buildings can take between 10 and 80 years to simply recoup the greenhouse gas emissions caused by construction.

The current approach of parceling out CALGreen responsibility among state agencies by chapter and section misses a big picture perspective, the opportunity to gather current knowledge emerging, best practices, and forward-looking design parameters that can shape buildings in the near term.

We understand how the siloed current allocation evolved and how the various stakeholders, including the Energy Commission, California Air Resources Board, ACD, Building Standards, and other state agencies have important and legal responsibilities-

MR. BOZORGCHAMI: Michael, I apologize. I have to set the three-minute rule. If I may ask you to do submit those into writing to us. I apologize.

MR. MALINOWSKI: I'm happy to do that.

MR. BOZORGCHAMI: Please do.

MR. MALINOWSKI: Let me just get to the point, because I'm only two sentences away from that.

MR. BOZORGCHAMI: Okay.

COMMISSIONER MCALLISTER: Go ahead Michael. Go ahead and finish up. We really appreciate it. Go ahead.

MR. MALINOWSKI: We do understand the mechanics and the legal framework that scripts the current process, but we believe it's time to take a fresh look at that. And we encourage the leadership of the Energy Commission and Commissioner McAllister to join us in having conversations with Building Standards on a reboot of the CALGreen development process so that it can better serve California.

That is really the point I was trying to make. I apologize for going beyond the three minutes. Thank you.

COMMISSIONER MCALLISTER: I wanted to respond briefly. I just, I really appreciate your being here, Michael, and I really appreciate you and your colleagues' efforts on this front, on all these fronts.

And I think probably, there's a lot of head nodding going on in terms of, yeah, we need to find ways to navigate through this. And so, I just want to make a couple of points.

Number one, Berkeley has been incredibly innovative for sure. I think we all recognize that, but they actually did not bring their reach code to us for any sort of affirmation because it's not an Energy Code, actually, they use their police powers to ban new gas hookups.

And so, that's just an example of the fact that, basically, agreeing with what you said, that there are multiple jurisdictions and multiple kind of pathways that all have to be coordinated together. And so, the Building Code is one of those Part 6, Part 11, all the different pieces of Part 11, tiers.

That's part of the puzzle, but that's not even the entire puzzle because there are other jurisdictions that are completely outside of the Building Code process; Part 6 or Part 11; air quality. The area that they can be have a significant amount of authority. That flows from their being out of compliance with a number of criteria pollutants and ground-level ozone, and via the state energy or state implementation plan requirements that they have by virtue of being out of compliance.

So, that's another area that needs to be sort of grafted onto the energy discussion, the direct energy discussion.

And just a couple of heads ups, actually, you brought up embodied carbon, I absolutely invite you to participate in the August 26 workshop will have in the IEPR in embodied decarbonization track that is going to talk about HFCs half the day, and embodied carbon the other half of the day.

So, those are issues that, again, we don't know exactly what the jurisdictional landscape looks like, and that's part of the idea, is beginning to assess that out because embodied carbon is going to have a number of agencies that have something to say about that, and jurisdiction about the supply chains across the state and outside of the state and beyond.

So, that's certainly -- we're recognizing that you're not the first person to bring it up, but obviously, the construction industry across the state mobilizes tremendous amounts of resources. And so, we need to begin to link up sort of the academic piece of that and the practitioner piece of that with state policy in a much more direct way. So, thanks for bringing that up.

And then finally, the administration has recognized the need to connect a lot of dots across the various state agencies that have to do with buildings and particularly housing. And so, the CEC is leading sort of the assembly of a discussion across the housing agencies at the principal level to begin to grapple with the number of issues actually, particularly on new multifamily low-income housing, affordable housing sector.

So, we just wanted to agree with your concern about the need to really put the accelerator down on a number of topics that are both -- that certainly all of them overlap with the Building Code and Part 6, Part 11, but they also go significantly beyond.

And so, there's a number of integrative conversations that we need to have, and you bring that up. You're out there practicing

and out there in the real world and the silos don't apply. So, we need to do better, I think, in integrating those discussions at the agency level. So, thanks for bringing that up.

MR. MALINOWSKI: Thank you, I appreciate your thoughtful response. And I think we're really actually on the same page that when you really look at the scope of CALGreen and how many agencies it touches in its current framework, and what's missing without … there is no one agency that's fully responsible. It's not the Energy Commission, it's not CARB, it's not HCD.

Really, what we're suggesting is Building Standards should potentially convene some new entity, whether it's a commission or a committee or some somebody that is actually responsible for the highest level of thought leadership in terms of what CALGreen could be.

When it came out, it shifted the entire landscape of codes across the United States. It was groundbreaking, incredibly innovative, but it's fallen behind and it can't keep up. And we need to, I believe, shift the way we develop and envisioned CALGreen, and even envision its role in not just codes, but even sharing of information and a platform for discussion and vetting of issues and the integration of these various things.

So, I believe we're actually talking about exactly the same thing. The challenge is you're speaking in this hearing today as an Energy Commission workshop, and we understand that there's a legal framework and a funding framework, and a staff framework that you have

to work within; that's the sphere within which you operate, but there is nobody at the higher level other than probably the state political leadership.

But the stuff is in the weeds, it's technical, and it's highly complex. And that seems to be a missing link as you point out.

COMMISSIONER MCALLISTER: Just to invite you really, if you haven't heard from our staff already, I think you will about this A26 workshop on embodied carbon, and that could potentially -- beginning that discussion could potentially help us sort of … that will involve Building Standards Commission, for example, and will try to grapple with where the various jurisdictions might be on that, on that particular issue.

But I think that discussion specifically about embodied carbon might be able to help us build a template for the kind of broader discussion you're talking about. So, anyway, just let's keep this particular conversation open for now. And I really appreciate again your bringing it up today.

MR. MALINOWSKI: Thank you, too.

MR. BOZORGCHAMI: Thank you, Michael. Thank you, Commissioner.

Any other comments? Anybody else would like to … Heidi, I'm going to unmute you. Go ahead and state your name and affiliation please.

MS. WARNER: Hello, my name is Heidi Warner. I work for Energy Solutions and today, I'm speaking on behalf of the statewide

Utility Codes and Standards team.

So, I'd just like to thank you for the opportunity to submit comments and thank you for hosting another public meeting so that you can get the feedback. Also, thank you for the opportunities to submit our ideas. We've submitted a proposal, which is on the document for anyone to see.

We would really like to see CALGreen become a useful resource for local jurisdictions that want to go beyond Part 6. And as you can see in the proposal that the CASE team submitted, we would support going further than what is in the draft code language that we've reviewed today.

Particularly, we would like to see clear compliance requirements for multifamily buildings. So, being able to parallel the work that you're doing in Part 6 to pull out requirements for multifamily buildings. Also, encouraging high-performance non-residential buildings. In the express terms, there are no proposed revisions to CALGreen for non-res.

And then also, continuing to use CALGreen to encourage deep de-carbonization in new construction and also in retrofits or major building alterations.

So, we support you moving forward with anything that's going to move CALGreen forward. And we recognize that the proposal that is in front of us is a step in the right direction. And we really look forward to continuing to work with the Energy Commission and others who support moving CALGreen a little bit further in the next code

cycle.

MR. BOZORGCHAMI: Thank you, Heidi. So, any Q&As.

MR. STRAIT: There was a comment that Q&A box, but not a question. I'm not seeing any additional questions.

MR. BOZORGCHAMI: Okay, wonderful. I think Commissioner, if you're okay with that, we're going to move on to the next area and the agenda for today. Peter, would you like to?

MR. STRAIT: Sure. So, my name is Peter Strait. I'm the supervisor of the Standards Development Unit in our Building Standards Office. And today, I'll be presenting the changes we've made to the parts outside of Part 11 and Part 6, which are parts 2, 2.5, 3, 4, and 5.

Next slide, please.

So, we've added in these parts our non-substantive pointers. CEC staff worked with staff from the California Department of Housing and Community Development or HCD to identify areas in parts 2 through 5 that applied to building systems and equipment, also subject to efficiency standards.

We've added informative language, and I'm going to be referring to those as pointers to make readers aware of applicable standards and include brief descriptions of set standards where appropriate. These pointers are not considered substantive because the underlying standards applies regardless of their informative language.

So, the pointer might describe a requirement, but it's

describing a requirement that exists in Part 6. The pointer itself is not applying that requirement. And staff is interested in knowing if there are other areas beyond what we've identified thus far and have included in this presentation, where similar informative language would be of benefit to readers of those other codes.

Next slide, please.

So, starting with Part 2, which is the Building Code, we've retrained some references to the California Energy Code in Chapters 2 and 12, which replace references to the IECC where necessary. So, the model code language refers to the model Energy Efficiency Code, instead, we need to change those to reference the California Energy Code.

We've also added language to clarify the relationship of the Energy Code's Climate Zones and IECC Climate Zones in Chapters 12, 14, 21, and 25. And since we've done this both in Part 2 and in some other parts, in my next two slides, I'm going to show what the differences are in Climate Zones just for illustration's sake.

So, next slide, please.

This is the IECC Climate Zone map for California. You'll notice that the vast majority of California falls into a single Climate Zone, which is Climate Zone 3, and that overall, there's only a total of five different zones that California is divided into. In contrast, we have 16 Climate Zones.

Next slide, please.

The Energy Code recognizes several geographic features that

create microclimates in California. California is well-known for its very varied geography and different climates throughout the state. This sets expectations for climate specific designs for buildings, and the California weather data also captures a statewide coincident peak demand climate conditions.

So, we have a much more detailed model of what's going on. So, that Climate Zone 3, that takes up a lot of the state as you see, gets broken down to many smaller parts.

Next slide, please.

So, next to the Residential Code for Part 2.5, we've had the same clarification of the difference between Energy Code and IECC Climate Zones in Chapters 4, 7, 8, and in Appendix S.

Next slide, please.

In the Electrical Code, which is Part 3, we've added a pointer to California Specific Local Ordinance requirements in Article 89. And this simply refers to the process established under state statute and law for local jurisdiction to adopt a local Energy Code. Since there was a little bit more process than specified in the model codes, we had to add some language there.

We added a pointer to new Energy Code electric ready requirements, and we added those to the Electrical Code, Article 408 regarding Panelboards, Article 422 regarding Appliances, and Article 440 regarding Space Heaters.

And similarly, we've added a pointer to new Energy Codes, storage ready to requirements into Article 706.

Next slide, please.

In the Mechanical Code or Part 4, we've similarly added a reference to California-specific requirements for Local Ordinance approval in Chapter 1. We've added pointers to Energy Code air filter standards into Mechanical Code Chapter 3. We've added pointers to Energy Code duct sizing and leakage testing standards into Mechanical Code Chapter 6, and we've added pointers to Energy Code pipe installation and slab floor installation standards into Mechanical Code Chapter 12.

Next slide.

For the Plumbing Code, again, we've had a similar pointer to California-specific Local Ordinance requirements into Chapter 1. We've added pointers to California water-related appliance standards applicable to plumbing, fittings, and fixtures in Chapter 4.

Strictly speaking, this is a pointer to Title 20 appliance regulations rather than a pointer over to Part 6. Although Part 6 does also specify compliance with applicable federal and state appliance efficiency standards.

We've added a pointer to Energy Code water heating system standards into Plumbing Code Chapter 5, and we've added a pointer to Energy Code pipe insulation standards into Plumbing Code Chapter 6.

Next slide.

And with that, if anyone has any questions about these additions, I'll be happy to answer them.

MR. BOZORGCHAMI: Peter, I don't see any raised hands. I

don't see any Q&A in the question and answer.

So, with that, I'm going to, if it's okay with you Commissioner, I'm going to open up to anybody that has any comments or concerns of what they've heard today. Part 11 and all the parts of Title 24 that were provided pointers.

Oh, we have one raised hand.

COMMISSIONER MCALLISTER: Yes, please, okay. Just go ahead and just accept, thanks.

MR. BOZORGCHAMI: Sure, thank you. Bob, go ahead and state your name and affiliation please. Thank you, sir.

MR. RAYMER: Yeah, Bob Raymer, with CBIA and also CBPA. Could you just very briefly make a comment on the non-res changes for Part 11?

MR. STRAIT: We are not proposing changes to the non-residential Part 11 requirements as a part of this update.

MR. RAYMER: Thank you. I know Matthew was listening in today, and I'm sure he's going to like hearing that. Thank you.

MR. STRAIT: Sure. You're welcome. This code cycle, we're just making A4, the residential section.

MR. SHIRAKH: To be more specific, it's just seeing single family.

MR. STRAIT: Single family, yes.

MR. RAYMER: And we just love that. Thank you, guys.

MR. BOZORGCHAMI: You're welcome, Bob.

MR. SHIRAKH: We ran out of time, Bob.

MR. RAYMER: I know, I know. Thank you.

MR. STRAIT: Now, I will say the one downside to be aware of is that means that there's going to be less guidance for local jurisdictions, meaning that we might see a greater diversity of local standards in some of those areas. So, don't thank us yet.

MR. BOZORGCHAMI: Alrighty. Commissioner, I don't see any raised hand or questions in the question and answer box. So, with that, and if it's okay with you -- we got one, Peter, that just came through. Probably read that one.

COMMISSIONER MCALLISTER: So, maybe, I'll just suggest that … I don't want to clip the time too much if people are thinking, so maybe folks can give us an indication about whether they do plan to raise their hand or that they want to ask a question that's not quite formulated yet. I don't want to get to the end of this and have to cut people off.

MR. BOZORGCHAMI: Yeah, no, I agree. But meanwhile, we did have one comment or question in the Q&A, Peter, would you like to …

MR. STRAIT: It's more a comment from Claire, but I'd be happy to read it. She says about the answer to her comments regarding circulation with higher efficiency heat pumps. She also believes that heat pumps may have been oversized and mentioned that to the installers at the time.

However, they sighted that they were replacing same size and later with more discussion with SMUD, it was suggested that vaulted ceilings make more space to consider.

I will say that for interior volume, for heating loads a vaulted ceiling is going to require a larger unit. But since cold air settles, it's going to have less of an effect when you're in a cooling cycle.

And it has been common practice and to oversize equipment at the initial install, because if you're kind of on a border between equipment sizes, it's always better to have too much than too little from the builder perspective, because it’s less likely to generate a callback.

Nonetheless there are thermostats available that you can program to have fan only operation at certain times throughout the day so that you can get some of that additional fan circulation. But otherwise, yeah, equipment sizing is always kind of tricky.

MR. BOZORGCHAMI: So, Claire, I recommend you maybe communicating with our Energy Commission hotline. The folks on the Title 24 hotline may be able to help you and provide you more clarification. And their number is 1-800-772-3300 to help you with the concern you're having with your system.

And I'll type the phone number for you there under in the Q&A also.

MR. STRAIT: And just as a SMUD customer, I'm aware that there are some additional rebates that they have for various thermostat products. So, that might be an option, though our hotline wouldn't be able to help with that directly.

MR. SHIRAKH: So, just to add to that, Claire, your system,

if it's oversize, it's actually a prime candidate for what the strategy we call pre-cooling. And I think in SMUD territory, the on peak, the most expensive time is around 5 o'clock, 5:00 PM to 8.

So, with your system, what you can actually do is like everyone, maybe starting 4:00 PM, you can start pre-cooling your home, and then shutting off the air conditioner, and you can probably coast through those most expensive hours. So, that is probably something you can take advantage of.

MR. BOZORGCHAMI: Yes.

MR. STRAIT: Well, we have a comment. Is this is a comment or a question? Let me see this, from Armando Ramirez, who says new space commissioning systems must be accompanied by heating and cooling load calculations. Typical industry practice is to replace the entire system under a like for like exception intended for component change outs.

And unfortunately, that I think is correct. And that's another element that as the technology has improved for all of this kind of equipment, now you can do more -- the equipment size, it kind of changes a little bit in terms of what can be satisfied by a system of certain nominal tonnage. So, yeah, there's a lot of nuances there. Thank you for your comment.

MR. BOZORGCHAMI: Alright. So, with that, any more questions, raised hands?

MR. STRAIT: Claire, I'm just reading them for the benefit of the folks that are on the phone. Claire adds; thanks again, for

more explanation.

While working at SMUD, I tried hard not to oversize. It's true that fan -- fan is definitely available even with the fancy new SMUD thermostat. I was somewhat concerned temperature only data might not know this. I might be increasing my use not because of temperature. Pre-cooling only lasts a little while, but it's the stuffiness, not the temperature that's turning into the issue.

She's going to be heading out, but she wanted to make sure to mention that.

We do model just for clarity in terms of our energy modeling; we do model a certain amount of fan use related to the ventilation, distinct from how much fan use we would expect strictly from a cooling load. So, we are assuming more hours of fan operation that it sounds like your system is providing under default behavior that's strictly related to the cooling loads.

So, let me think … if there's anything else -- Danny, do you know much about the duty cycle that we assume for ventilation fans? I don't think we have the right person on the phone to talk about that.

MR. TAM: Yeah, I don't know.

MR. SHIRAKH: We use the CBECC defaults and again, this discussion is not really … it's important but it's not relevant to the topic at hand.

MR. TAM: Yeah. We need to stay on the topic of Part 11, folks.

COMMISSIONER MCALLISTER: Yeah. Let's make a last call here

for comments. So, yeah, thanks for pulling it back. That was helpful.

MR. BOZORGCHAMI: So, with that, I think I'm gonna, if it's okay, Commissioner, I think we're gonna conclude the workshop or the hearing today. And we're hoping to receive comments from you folks on what you've heard. And what's been posted on the 45-day language by the 16th of August.

COMMISSIONER MCALLISTER: Yeah. So, just to point out, the fact that we had this second hearing did not change timeframes for the finishing up the 45-day, 15-day language and the adoption schedule.

So, the final deadline for written comments is August 16th. So, that's coming right up. And that's remind everyone when the end of the comment or what the next steps are for as we move towards adoption, getting on the business meeting.

MR. BOZORGCHAMI: So, our next steps is, as we get your comments, we will evaluate, and we will develop the 15-day. And then from there, we're going to a special business meeting on September 30th for adoption of Part 11 and all the pointers that Peter had -- for the other parts of Title 24 that Peter had just presented on.

That will be on a special session of the business meeting held by the Energy Commission. And there will be a notice that goes out for that here shortly. Just stay tuned and keep your eyes open for that. Thank you.

COMMISSIONER MCALLISTER: Thanks, Payam. And the goal is to get all of us over to the Building Standards Commission. The Part 6

is a little bit ahead of Part 11, but all of that will be over to Building Standards Commission for consideration at their meeting at the end of the year to adopt the entire Building Code as a whole.

So, that's driving the schedule. So, really helpful if we can get your written comments sooner rather than later.

MR. BOZORGCHAMI: Yeah. Our time is limited right now as you could tell. We were not able to do as extensive as what we wanted to do for Part 11, but we really, really wanted to make sure we get Part 6 done right. And with that, I recommend that we conclude today's hearing.

COMMISSIONER MCALLISTER: Yeah. Well, thanks everyone for being here, looking forward to everyone's written comments, and we are adjourned for today. Thank you.

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

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