DOCKETED	
Docket Number:	22-BSTD-01
Project Title:	2025 Energy Code Pre-Rulemaking
TN #:	252589
Document Title:	September 28, 2023 Pre-Rulemaking Workshop Transcript
Description:	Transcript for September 28, 2023, 2025 Energy Code Pre-Rulemaking Workshop on Single-Family Peak Cooling Requirements.
Filer:	Michael Shewmaker
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	10/13/2023 7:37:51 AM
Docketed Date:	10/13/2023

CALIFORNIA ENERGY COMMISSION

In the matter of:

2025 Energy Code Pre-Rulemaking) Docket No. 22-BSTD-01
_____)

STAFF WORKSHOP:

2025 ENERGY CODE SINGLE-FAMILY PEAK COOLING REQUIREMENTS

REMOTE ACCESS VIA ZOOM

THURSDAY, SEPTEMBER 28, 2023

9:00 A.M.

Reported by:

Martha Nelson

APPEARANCES

CEC STAFF

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PUBLIC COMMENT

Bob Raymer, California Building Industry Association

Jon McHugh, McHugh Energy Consultants

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Steve Strawn

Nick Brown, Build Smart Group

Dan Johnson, Beyond Efficiency

P R O C E E D I N G S

9:05 a.m.

THURSDAY, SEPTEMBER 28, 2023

MR. BOZORGCHAMI: Good morning everyone. Let's get started here. Thank you everyone for joining us for one of the 2025 Pre-Rulemaking Workshop. The agenda for today is only one topic and that's the single-family peak cooling that we're going to be talking about.

My name is Payam Bozorgchami. I'm one of the senior engineers here at the Building Standards Branch within the California Energy Commission.

But before we start, like always, we're going to have to go through some housekeeping rules.

This workshop is being recorded and we do have a transcriber on the call today who's going to be taking notes and taking down all comments and everything that you guys say to us.

So we do want -- when you guys have an opportunity to provide your public comments, please raise your hand and I will unmute you and you can state your name and your affiliation. And if you're the first time speaking, please spell your name out, first name, last name, and what affiliation you're with. And if you're on the phone and you would like to ask a question, you could press star nine to raise your hand and I will unmute you.

But you're going to also have to probably hit star six to mute and unmute yourself from your end.

Like I said, this is a recorded workshop today. Depending on the number of comments that we get from today's workshop, we may put a two minute limitation for speaker.

And in case of an emergency, a few of us are here in the office today, we're on the 15th floor, if the emergency bell goes off, we will evacuate. We will not turn off the recording. We will pause it, but we will come right back. I'll throw up a screen that says the National Resource Agency office has been evacuated. And as soon as we get the clear signal to come back in, we'll come right back in and we'll continue the workshop.

What else am I missing?

With that, the agenda for today, it's only one topic that we're going to be talking about and that's the single-family peak cooling and there's going to be an introduction. From the introduction, we're going to go straight into the topic. I think it just flows better. And then at the end, we will allow everybody to raise your hand, or put a question in the Q&A and we will read them out or we will unmute you and you can state your name and affiliation and we can go from there.

On the bottom of this page -- and this

presentation also will be posted tomorrow or Monday. We'll try to get it out to you by tomorrow. As best as we can. But this website here -- this link, excuse me, will take you to our past events workshops. And there's a lot of stuff in here and if -- that's happened at the Energy Commission. It's not just for Title 24, Part 6. This is about all the other proposals, all the other workshops that's happened.

But you'll notice there will be a staff workshop 2025 Energy Code. And on this one is the commercial kitchen laboratories. And if you click that, you come to the main web page for that date and you'll see the notice, the presentation that's going to be posted, and the recording. So if I said something and don't remember, you can always go back to the recording and try to capture that.

And if you cannot submit your comments today, it's not the end of all things. You do have time. You do have to October 12th to submit your comments in writing and we will, depending on the comments that comes in, we will respond to you either by writing or email or just give you a phone call. So if possible, when you do that, submit your comment to our comment into the docket, please at the end, a signature, put your contact information, email, phone number. It will be the best way for us to reach out

to you and have a quick, productive discussion about the comment that you've made.

With that, I'm going to go right into the workshop and I'm going to pass the baton over to Javier Perez, our project manager for the 2025 Energy Code and he will do his presentation.

Javier?

MR. PEREZ: Thanks, Payam. I'm going to get my screen sharing up. Standby. All right, looks like you can see my screen so let's get going.

Hi, my name is Javier Perez and I'm with the California Energy Commission. I'm the project manager for the 2025 Energy Code. And for this segment, I'll briefly go over our authority and process, some of the drivers behind the California Energy Code, the underlying energy metrics of our Code, and finally timelines for the 2025 Energy Code update.

I do want to take a second to thank you all for taking time out of your day to participate in this pre-rulemaking workshop and hope that through your participation, through your collaboration with us, that we can make great strides in terms of energy efficiency and our long-term state goals with the 2025 Energy Code update.

All right, let's start with the Energy Commission's authority and process. This slide is a little

bit loaded, so I'm going to bring it up in segments and hopefully train your eyes to what I'm speaking to.

Two California assemblymen, Charles Warren and Al Alquist, co-authored the Warren-Alquist Act. And this Act authorizes the Energy Commission to develop and update the Energy Code on a triennial basis and for local jurisdictions to enforce the Energy Code through the building permit process. And the Energy Code was developed at the direction of the Warren-Alquist Act to reduce the wasteful and economic, inefficiency, or unnecessary consumption of energy.

On the right, you're now seeing a chart that compares the site energy consumption of a single-family residential building when built to the 2021 International Energy Conservation Code, in blue. And then that same building built to the 2022 Energy Code requirements, in green. nonresidential buildings are a lot more complex, a lot more variables, and we'll take multiple slides, so for this session we'll just go over residential buildings.

Now if you take a few points away from this graph, one is that averaging across all climate zones, single-family buildings built to California's Energy Code use an estimated 52 percent less site energy than those built to the 2021 International Energy Conservation Code. Now for the 2022 cycle, we use time-dependent valuation, or

TDV, energy as the underlying energy accounting metric. And in TDV, which values energy differently depending on the time of day and the day of the year, the Energy Code requirements led to single-family buildings consuming 45 percent less TDV energy than if they were built to the 2021 IECC.

Now the last takeaway we'd like to leave this slide with is that while our buildings are becoming increasingly more efficient over time and outpacing national standards, our buildings' natural gas consumption, the light green bars or light green segments of those bars, are a large portion of our buildings' overall energy consumption. Our state has lofty greenhouse gas emissions reduction goals, and buildings play a part in achieving those goals. And our state also has clean energy requirements for electricity retail sales over the next couple decades that we'll go over on the next slide.

Now if you'd like to learn more about how the 2022 Energy Code compares to federal standards, our 2022 Impact Analysis Report can be found on the link below.

Now these slides will be posted as soon as possible. Hopefully, by the end of the week here, a lot less slides for this workshop relative to ones in the past, so fully expect to have that done by tomorrow.

Now let's talk about these state-level drivers

and some of the themes of the 2025 Energy Code.

Now, we're obligated to contribute to the state's greenhouse gas reduction goals, and one of those being Senate Bill 100, or the 100 percent Clean Energy Act of 2018, which states that by 2045, 100 percent of electricity retail sales must come from clean energy sources. Now this will make electricity significantly cleaner over time and will also have substantially positive impacts on the state's greenhouse gas reduction goals. Now another driver is Governor Brown's carbon neutral executive order to achieve carbon neutrality by 2045.

So the Energy Code is tasked with contributing to these goals and must do so by increasing building energy efficiency requirements, all while proving measures to be cost effective and technically feasible.

Now, how do we plan to contribute to these state goals with the 2025 Energy Code?

Now we'll continue to explore where highly efficient heat pumps can be introduced as a prescriptive baseline for space and water heating systems. We'll continue to promote demand flexibility. And in 2019 we introduced solar photovoltaic system requirements for low-rise residential buildings, and in 2022 we introduced similar requirements for nonresidential, high-rise residential, and hotel motel buildings, and also added

energy storage system requirements. And in 2025 we'll continue to work towards including these systems and considering where their use can be expanded.

Now for the purposes of the Energy Code, a process is an activity or treatment that is not related to human occupancy, and a covered process is just one of those processes that we have requirements for. Processes can consume large amounts of energy. And as with all items identified on this list, we're going to continue to look at these systems to find efficiencies where possible.

We'll also continue to make sure that our standards continue to serve as protection for affordable housing. Now, when our standards increase energy efficiency, they raise the bar for newly constructed buildings, and in doing so, they bring affordable housing construction along with them. We're looking at affordable housing programs and the compliance tools that they use and hope to streamline some of their efforts to make it easier for the designers of these buildings to demonstrate compliance with our code and demonstrate compliance with the requirements of affordable housing programs.

Existing buildings will continue to be a focus of the Energy Code. And we're also looking at smaller homes or ADUs and how our requirements fit for these smaller dwellings.

And we'll continue to collaborate with the Air Resources Board, Department of Housing and Community Development, and the Building Standards Commission to ensure that our buildings continue to meet acceptable levels of indoor air quality. And we'll also support these agencies as the transportation industry continues to move towards electrification.

Now let's go over our underlying energy metrics that help determine energy savings.

For the 2025 Energy Code, we're pivoting from using time-dependent valuation energy, or TDV energy, to using long-term system costs. Long-term system costs, or LSC, is the cost effectiveness and energy valuation methodology used in development and implementation of the Energy Code. LSC factors are used to convert predicted site energy use to long-term dollar costs to California's energy system.

Now the underlying varying valuation of energy, depending on the time of day and the day of the year, that was used in TDV still remains, but we've just converted those energy savings into long-term system cost savings to better reflect the actual cost of energy to consumers, the utility system, and to society. This graph represents an average day's dollar per megawatt hour, and how that cost varies by time of day, and the different inputs that go

into that cost.

Now the source energy metric was introduced during the 2022 Energy Code cycle and is defined as the source energy of fossil fuels following the long-term effects of any associated changes in resource procurement. It focuses specifically on the amount of fossil fuels that are combusted in association with the demand side energy consumption of any given building. To calculate source energy for a given hour, the value in that hour for each forecasted year is average, a lifetime average source energy.

And because a building's energy use depends partly on weather conditions, which differ throughout the state, the Energy Commission established 16 climate zones representing distinct climates within California. This isn't new for the cycle, but hopefully it serves as a refresher if you're already up to speed on California's Energy Code. And as a result of having 16 climate zones, requirements can vary significantly from zone to zone, which may lead to variance in requirements for buildings in different areas of California where measures are found to be more or less cost effective.

If you'd like to get more detail on the energy accounting work that was done for this 2025 cycle update, you can find recordings and slides for the two workshops we

held in 2022 on the links on this slide. We'll have final reports on this effort posted in the coming months.

All right, now let's talk about timelines and go over where we are in this cycle and then where we're going over the next few years.

From June of 2021 to May of 2022, the Codes and Standards Enhancement Team, or the CASE Team, requested and received over 700 measure proposal ideas. In the months that followed, the Energy Commission collaborated with the CASE Team to get that listed on the 80 measures and further down to 40 or in the 40s as this work has progressed.

From March to November of 2022, the Energy Commission updated weather data, LSC and source energy metrics, and the CASE Team then held their welcome webinars in October of 2022 and followed that with workshops on measure proposals through May of this year.

And from May to July of this year, the CASE Team published a draft measure proposal report and held public comment periods to solicit feedback on these measures. If you'd like to view those draft reports and final reports, they're available on the Codes and Standards Enhancement Team's website at the bottom of this page. And they've also been docketed on the Energy Commission's docket. We expect to have slightly modified or updated final versions of all reports updated in the coming days, so stay tuned

for that. But, yeah, everything related to that work is finalized.

Now what's to come?

The Energy Commission will be publishing measure proposal reports for the 2025 heat pump baselines and photovoltaic and energy storage system requirements in October. The Commission will then publish draft updates to the 2025 Energy Code, or draft express terms, in October, which starts in a few days but ends 31 days after that. And we expect to open rulemaking in 2025, rulemaking for the 2025 Energy Code in January of 2024.

Now we expect to adopt the 2025 Energy Code in June of 2024 or next year, and the Building Standards Commission should have their approval of all updates to Title 24 in December of next year. And the effective date of the 2025 Energy Code will be January 1, 2026.

Now for this cycle, this is a list of senior staff in the Building Standards Branch at the Energy Commission. And if you're bad with names, again, my name is Javier Perez and I'm the project manager of the 2025 Energy Code. Payam Bozorgchami is our technical lead and the backbone for everything we do. He specializes in building envelope additions and alterations to existing buildings and accessory dwelling units or smaller dwelling units. Haile Bucaneg is our lead on covered processes,

demand response controls, and our nonresidential and residential alternative calculations methods work. Mohammed Saeed is our solar PV and energy storage systems lead. And Bach Tsan is our lead on HVAC systems and refrigeration. Now if you'd like to reach out, our email convention at the Energy Commission is just firstname.lastname.energy.ca.gov.

Now our goal is to build consensus through these workshops and through this public process and your participation, your comments, they all go a long way in helping with that goal. So thanks again for making time today and let's get on to the next segment here.

All right, so again, really short agenda, not a lot of slides here. We're going to be talking about peak cooling and what we're looking at for single-family buildings with the 2025 Energy Code.

So the intent of today's workshop and what's being proposed is to ensure that newly constructed buildings don't unnecessarily exacerbate challenges related to weather driven peak events. We're looking at weather patterns showing higher frequencies and peak events in the foreseeable future. And these events result in higher demand on the grid and can have negative effects on grid resiliency. And they can also result in higher cost to consumers since peak events coincide with higher time of

use utility rates.

Now for the purposes of this proposal, peak cooling is going to be defined as mechanical cooling during the hours of 4:00 and 9:00 p.m. or between 4:00 and 9:00 p.m.

All right, now this is a comparison of the average value of electricity shown in long-term system cost dollars during winter between the 2025 Energy Code cycle, on the left and the 2025 cycle, on the right, '22 on the left, '25 on the right. Now the 2025 updates to our LSC metrics assumed significantly higher amounts of electrification over the 30-year period that is used in our analysis of our proposed measures.

Now, the most impactful difference between 2022 and 2025 assumptions is that the highest annual demand is now forecasted to happen in the winter evenings. Now this is reflected in the new winter peak that you're seeing, on the right, and that's driven by transmission and distribution costs which track with highest demand times. This is a notable change from previous code cycles which had highest peaks occurring in the summers constantly throughout, I think, probably every code cycle we've had.

Now, for reference, on the left, you can see the 2022 LSC or TDV summer average electricity costs, and on the right, you can see transmission and distribution costs

decreasing, shifting to the winter peak on the previous slide. Now we're really in a transitional period, you know, where the value of summer electricity in the near term is very high, but over a 30-year period of analysis, winter is becoming increasingly more important. Now from a building performance perspective, a lower summer LSC peak could result in significantly higher summer peak cooling for some buildings when demonstrating compliance with the performance approach and trading away measures that save peak cooling energy.

So our intent is to try and ensure that these buildings don't create unnecessary demand during these peak cooling periods. Now how do we address this potential issue?

Well, step one of the strategy was to isolate the periods that we're looking to affect. These challenges and changes in time of use rates generally occur between 4:00 and 9:00 p.m., and that was the window that we chose to focus on.

Now step two was to identify the types of buildings that could have high variances in mechanical cooling loads. Our modeling showed that some buildings could have significantly higher mechanical cooling demand than that of a building that met prescriptive requirements.

Step three was to zero in on the climate zones

that have meaningful cooling demand, and where mechanical cooling demand is small, perhaps the limit there would not be necessary.

And step four was to determine a performance target for buildings to be covered by this peak cooling limit.

So which buildings had a high variance in mechanical cooling with performance tradeoffs?

Now we found that single-family buildings could trade away multiple measures that save peak cooling energy. This could result in an increase of more than four times the mechanical cooling side energy use of a building that met prescriptive requirements when compared to a building that met the prescriptive requirements of the Energy Code.

Now when analyzing multi-family and nonresidential buildings, we didn't find significantly higher peak cooling loads when similar tradeoffs were made. So there's no intent to pursue a peak cooling limit for multi-family buildings and nonresidential buildings.

Just for a little background on that, nonresidential buildings generally have schedules that don't get into the evening hours, you know, the 4:00 to 9:00 period that we're looking to affect. And multi-family building envelopes are a little bit different than single-family, and we found that the effects of removing some of

these measures were highly more impactful on single-family buildings than they were on multifamily buildings.

We then looked at peak cooling energy use for single-family buildings by climate zone, based on the 2025 proposed standard design, and as a result further zeroed in on the buildings that should be covered. We found that Climate Zones 4 and 8 through 15 have high enough peak cooling energy use that were they to double or even triple, for example, the impact would be significant. Now Climate Zones 1 through 3 and 5 through 7 are the coastal climate zones, which just don't really see mechanical cooling needs and or not significant mechanical cooling needs. And then Climate Zone 16 is our coldest climate zone, think Lake Tahoe, think Yosemite, think snow, think Shasta. Those areas just don't have the mechanical cooling demand that we see in the climate zones that we're looking to regulate, which is 4 and 8 through 15.

So what are we proposing that this peak cooling limit look like?

Now we're looking to apply it to single-family buildings in climate zones 4 through 15, as you saw on the last slide. We're proposing to set a performance target to the resulting peak cooling energy use of the 2025 standard design building. And what that means is that your proposed building size and orientation, meaning the prescriptive

requirements, would be what sets the peak cooling limit in the performance approach. And if your proposed design's peak cooling kilowatt hours is equal to or less than the standard design peak cooling limit, then your building is in compliance.

All right, now let's talk about next steps. An updated version of the 2025 CBECC-Res research version, including the proposed peak cooling limit, will be available for download in the coming weeks. It'll be available for download at the link on this page. And when it is available, you know, we intend to send out a notice on the docket so that people get notification that it's available for download.

I think one of the things that we would like to ask is that stakeholders kick the tires. You know, I think, you know, this is going to affect, again, specifically single-family buildings and a portion of those in certain climate zones; right? So designers that have experience with software and that do this work certainly want to hear your feedback on this in the coming months here.

The docket where we'll have the notices linked on this page and language that will describe this peak cooling limit will be added to the single-family residential ACM reference manual. And we'll share that language or that

draft language as it's developed.

I think we expect to have at least a couple more of these workshops over the next few months, likely early next year, and, you know, hope to continue to engage once stakeholders have had a chance to download the updated software and provide feedback about what they're seeing as a result of trade-offs in that limit.

So, you know, appreciate that we have a common period that's in two weeks for this workshop. But for the purposes of this change, I think we'll be having longer discussions over the months that are to come. So I don't want you to feel like this two-week window is your only chance to provide any feedback or to have meaningful input here.

And with that, I started this by saying, you know, we had only a few slides here and I spoke faster than I meant to, so we're now at the questions portion. So if anyone has questions, Payam, perhaps I'll pass it to you and see if you can coordinate that.

MR. BOZORGCHAMI: Thank you, Javier.

With that, we do have a couple of raised hands and a comment in the Q&A. So I'm going to go straight to the raised hand.

And I think the first one is Bob Raymer. Go ahead and state your name and affiliation, Bob.

MR. RAYMER: Thank you, Payam and Javier. This is Bob Raymer representing the California Building Industry Association. And, wow, there's a lot to take in today, and I know I'm not going to get this done in two minutes, we definitely will get you some comments. We'd probably like to have, you know, a chew-the-fat session with staff because there are going to be a ton of questions.

We need to get our hands on that beta version as soon as possible because we've started doing analysis. And I don't want console doing analysis on something that's inherently going to change. And so, and as always, we will work with you with our findings and all that.

Going back to those charts, I'd like to understand a little bit better the transmission and distribution spikes that we've seen. Yeah, right, particularly that one.

I'm assuming this is EV charging and, you know, space heating in the winter.

MR. PEREZ: Yeah.

MR. RAYMER: And what I don't understand is that there seems to be a disjunction where at one point in time, the Energy Commission was saying and ARB was saying that this is -- that EV was not going to have much of an impact at all on the grid and now it is, apparently, a huge one here. And we know that that's not really the case. I

mean, the summer peak load is still going to be the summer peak load. We're going to get hot, very hot summers. It's going to be probably the priority for the regs. And what I'm seeing here is, you know, the course first and second place will now be occurring in the winter where the fact is in California, we're going to be having milder winters. I mean, you could probably see a lot of rain instead of snow or whatever, but which is its own problems. But there's a lot of questions here.

So, you know, we'll, you know, we'll get our written comments into you. It's just, you know, we're heading into the formal rulemaking stage and it leaves me very queasy trying to figure out how can we let you know what we really feel about the standards if we can't do the total analysis. As always, CBI looks for, you know, what does compliance look at the end of the day? You know, what are the most cost effective ways, the lowest cost, the most cost effective ways to get from A to B? And right now for most of the climate zones, we can't really give you any kind of accuracy on that.

So, wow. Aye yai yai. Okay, we need to chat afterwards, so I'll reach out to you over, Javier. Thank you.

MR. RAYMER: Thank you, Bob. And we look forward to that discussion.

MR. PEREZ: Yeah. Yeah, thanks, Bob. I think we've met a few times already and I think we'll continue to meet to make sure that we can get on the same page on these efforts here. So really appreciate your feedback. I think we want to make sure we're all on the same page as we keep moving forward, so appreciate your engagement.

MR. BOZORGCHAMI: Thank you.

Next, Jon McHugh. Go ahead and state your name affiliation.

MR. MCHUGH: Hi, Jon McHugh, McHugh Energy. Very interesting presentation today.

You know, similar to Bob's comments, I used to work for a winter peaking utility. I know that things have changed, but I kind of wonder if you know what Bob's bringing up about EVs, if you know right now rates are low in the middle of the night. And the projection is that rates are going to be high, higher in the middle of the night and, you know, there will be more emphasis on workplace charging. And, of course, there's more people whose workplaces are at their homes, so that will be more EV charging in the middle of day.

I'm actually very supportive of, you know, the approach that's being considered. We are moving into a hotter environment. We're expecting temperatures to get hotter. We don't want buildings to lose the features that

keep them not only saving on utility bills but also preventing blackouts, and also if a blackout does occur, the life, safety, and health issues associated with buildings that are able to ride through, you know, a hot -- heat storm in the summer and loss of power.

The other comment I have is I think it would behoove the Commission to take a look at other building types, and in particular hotel/motel which has that same kind of bi modal peak for water heating, which is both in the evening and in the morning. And, you know, also, you know, has sort of a residential dwelling units that, you know, potentially are also not so internally low dominated but more envelope dominated.

And then finally, this kind of approach, actually, I think aligns well with the national standards. If you look at ASHRAE 90.1, if you're using the performance approach that performance approach has a requirement that the -- that there's not excessive tradeoffs between envelope requirements and the other, and the, you know, mechanical and lighting and that sort of thing. So what's being proposed I don't think is really that new.

Similarly, for the ICC for the residential requirements, there's also, when you're looking at the performance approach, there's also a limit on SHGC. So the SHGC, the, you know, the area weighted average SHGC, is not

great, you know, in Climate Zones 0 through 3, and California is primarily in the ICC Climate Zone 3. Their residential standard says the average at SHGC can't be any higher, and actually -- and the area. And then it's total thermal conductance is also not higher, so actually fairly well aligned with what's happening in the national standards.

I'll stop there but thank you very much for this opportunity.

MR. BOZORGCHAMI: Thank you, Jon. We'll be talking. Thank you so much.

Next we have Ronnen Levinson from LBNL. Please state your name affiliation, and if you can spell your name for the first time.

MR. LEVINSON: Sure. Good morning. My name is Ronan Levinson R-O-N-N-E-N L-E-V-I-N-S-O-N. I'm a staff scientist at Lawrence Berkeley National Laboratory. And thanks for sharing this strategy for trying to limit the cooling demand. A few comments.

First, I want to make sure that we're considering, not just the cost to the system but the potential hazards that we might be inducing in homes or other buildings, why anything that pushes our buildings to become hotter in summer, and so that means hotter roofs or windows that are admitting more solar heat gain? Because

we have to worry about the consequences in the event of either a public safety power shutoff or grid failure, or just in disadvantaged communities where there might not be economic access to air conditioning.

So, that's one point. We need to think a little bit beyond just cost to the system but the effects on people.

The second is some of the envelope provisions in Title 24, Part 6 really have the greatest effect when it comes to major alterations. And here I'm thinking about roof coverings because the vast majority of the roof covering market, which I mean roofing products like shingles or tiles or such, those go to existing buildings. And the requirements that are in Title 24 for both residential and commercial buildings do largely stem out of the analysis that's done for new construction with some modifications for major alterations.

But my point is that if we wind up in a situation where the cool roof requirements in Title 24 are based on assumptions tied to new construction, for example, they assume that the buildings have heat pumps, whereas, in fact, the buildings have electric cooling and gas heating because they're existing buildings and that heat pumps haven't been installed yet, we're going to wind up with the wrong recommendations for minimizing the energy use of

these retrofitted buildings.

And the third point is, I noticed that the focus here was on single-family residential. And one of the points that was made is that other types of buildings, such as nonresidential or multifamily, might not be using cooling so much during the peak hour window of 4:00 to 9:00. But this is a little surprising because, certainly, retail buildings are open well into this window, and many office buildings, too, are open well into this window as well. So I'm not quite sure I understand why the idea to cap the cooling demand isn't considering those other sorts of buildings.

So, just a few thoughts. And thank you very much for the opportunity to share them.

MR. BOZORGCHAMI: Thank you, Ronnen. I think we're going to have to have some discussions with you about the alterations versus new construction and that point.

MR. LEVINSON: Happy to.

MR. BOZORGCHAMI: Wonderful.

Next, we have Steve Strawn.

Steve go ahead and state your name affiliation and if you can, just spell your last name.

MR. STRAWN: Good. Good morning, everyone. Thanks, Payam, and Javier. My name is Steve Strawn, S-T-R-A-W-N, I'm from Kettleman (phonetic) Windows and

Doors. And as you might imagine, my focus is a little bit singular in the envelope considerations.

And so just listening to -- I mean I agree with Bob and his initial comments, there's a lot of time to go back here. But in continuing to listen, it looks to me like maybe part of the problem, at least, is focused on fenestration or windows and doors skylights. The tradeoffs maybe causing us some heartburn.

Is there -- you know, if we look at the envelope load and the excessive tradeoffs that may be allowed, and I'm not sure exactly how high they can go or what's even reasonable, certainly want to leave some flexibility in design which is why we use a performance approach to offer that flexibility for well-designed passive homes, for example, but if that is causing the problem, certainly limiting the amount of solar heat gain, rated solar heat gain for the windows might help to reduce some of that discomfort in the heating load that causes a discomfort.

I don't really know where you want to go with this. I'd like to get a little bit more information.

And, you know, Payam, you and I have talked a little bit about this, but I think that, at least from my view, understanding where you want to go with the solar heat gain tradeoffs, particularly with windows and doors, I'd like to learn a little bit more about that.

That's all. Thank you.

MR. PEREZ: Yeah, thanks. Thanks, Steve. Yeah, the idea is that these buildings are -- they perform as a system; right?

MR. STRAWN: For sure.

MR. PEREZ: So where you trade -- where one trades away solar heat gain efficiencies, then something should be made up to ensure that the buildings peak cooling load doesn't increase beyond that building if it had met the prescriptive requirements. So setting this up as a performance target does allow some variability or some flexibility for designers to still, perhaps, trade solar heat gain for insulation or vice versa, but it generally still sets a cap to not allow these buildings to have runaway peak cooling loads as --

MR. STRAWN: Agreed. Absolutely.

MR. PEREZ: -- those trade-aways happen.

MR. STRAWN: Yeah.

MR. PEREZ: Thanks, Steve.

MR. STRAWN: Thank you.

MR. BOZORGCHAMI: Thank you, Steve. And as soon as the program is available, I will walk you through and we'll discuss further.

MR. STRAWN: Oh, great. Thank you.

MR. BOZORGCHAMI: You're welcome.

Next we have Nick Brown.

Nick, go ahead and state your name and your affiliation.

MR. BROWN: Hi, I'm Nick Brown. I run Build Smart Group, a energy consultancy in Long Beach, so my experience is advising builders and architects on the tradeoffs and the most cost effective set of features to achieve code compliance.

So, you know, we added a third compliance metric in 2022, the source efficiency, and it's already somewhat challenging to have a set of features meet all three compliance metrics concurrently. So with this proposal that we add a fourth metric that also needs to be met, my concern is that we've got really got to make sure that this added complexity solves a very real problem.

So I would like to see the problem more clearly shown than the single bullet that you had saying you could have up to four-time peak cooling energy use with a certain set of features. My question would be: Moving to these 2025 LSC factors, what set of features lead to higher peak cooling energy use, and how much?

I'd like to better understand that because, to me, one of the reasons Title 24 works with builders like Bob's, you know, members and architects, like all the clients I work with, is that it allows for these tradeoffs.

It's always allowed for us to find a pathway that the design and builder can live with that meets their aesthetic and functional goals while still supporting the state's climate goals.

And I'm afraid that if the standard design of peak cooling energy use is that target, then we're really taking away the ability to creatively come up with sets of features that meet the code. We're going to end up getting closer and closer to prescriptive standard design without a whole lot of flexibility to deviate from that.

Thank you.

MR. PEREZ: Very much appreciate that feedback, Nick. I think we can certainly follow up with more detail on things that can be traded away.

Just for reference, you know, increasing HSPF and water heating efficiency results in sizable credits and, from there, measures that save peak cooling are generally envelope related. You know, ventilation cooling are measures that are designed to reduce that.

I mean, I'm sure you've got a sense to that, Nick, but I do appreciate that you're asking that we outline that in much more detail. So certainly we'll take that back and we'll have something for you.

MR. BOZORGCHAMI: Thank you, Nick. Thank you, Javier.

We have Bob Raymer.

Go ahead, sir. It's Bob Raymer from CBIA. Go ahead, sir.

MR. RAYMER: Yeah, thank you. Bob Raymer with CBIA.

And I really concur with Nick's comments just now. You know, for one thing, we've always seen the mechanical. Particularly, super efficient mechanical systems can play a great role in shaving the peak load. You know, those above and beyond the minimum requirements have always been a great way to do that. I've got personal experience in Sacramento where, you know, we moved to a higher efficiency air conditioner and cut my summer bill in half. It was stunning. And so it plays out quite well.

I think we, as Nick said, we need to look further into what these tradeoffs will continue to be, but CBIA is a big fan of mechanical tradeoffs.

Thank you.

MR. PEREZ: Yeah, and that's still available, Bob. I appreciate that point. You know, I think increasing SEER or EER efficiencies on mechanical systems that reduce cooling load will result in lower peak cooling, and then that does give you buffer to trade other things away.

MR. RAYMER: Exactly.

MR. PEREZ: So that still does exist, Bob, it's just the concerns we have around the winter savings and that variability resulting.

MR. RAYMER: Sure. Sure.

MR. PEREZ: So appreciate the feedback, Bob. I definitely look forward to trying to zero in on this.

MR. RAYMER: All right. Thanks.

MR. BOZORGCHAMI: Thank you.

Next, I'm going to go -- I think we're going to take a quick pause from the raised hand and go right to the questions and answers. We have Haile Bucaneg that's going to read those and we will try to answer those.

MR. BUCANEG: Thanks, Payam.

We do have a few comments online from, or questions online from Dan Johnson, Beyond Efficiency. First, "Could you clarify why is peak cooling in kilowatt hours over what time interval and shouldn't peak cooling be in kilowatts or power limit?"

MR. BOZORGCHAMI: Haile, I apologize. Can we take a quick 15-minute break? We're having a little bit of a technical difficulty. A few of our computers just died. Stay tuned. We're going to take a quick five minute break. I apologize.

MR. BUCANEG: No problem.

MR. BOZORGCHAMI: Sorry about that.

MR. BUCANEG: (Indiscernible.)

MR. BOZORGCHAMI: And, please, let the Q&As come in and let the raised hands go up and we will take care of it ASAP. Apologize.

(Off the record at 9:51 a.m.)

(On the record at 9:54 a.m.)

MR. BOZORGCHAMI: Okay, I think we're back on. And I sincerely apologize for that. We had one of our power sources for one of our laptops die, and we weren't able to hear some of the discussions.

So, Haile, could you start with that one more time? Apologize.

MR. BUCANEG: No problem. So the first question from Dan Johnson, Beyond Efficiency,

"Could you clarify, why is peak cooling in kilowatt hours, over what time interval, and shouldn't peak cooling be in kilowatts or power limit?"

MR. BOZORGCHAMI: Javier, do you want to answer that or should we come back?

MR. PEREZ: Yeah, I'm sorry. Can you read that one more time? I'm just getting my headset back going.

MR. BUCANEG: No problem, Javier.

So the question is: "Could you clarify, why is peak cooling in kilowatt hours, over what time interval, and shouldn't peak cooling be in kilowatts or power limit?"

MR. PEREZ: It's about site energy use during 4:00 to 9:00, and that's the window that we're looking at. Again, with peak weather events, as well as time-of-use rates, you know, that's been the driver for this measure.

You know, I don't know if Danny Tam might have anything to add there, but I think that might answer your question.

MR. BOZORGCHAMI: Danny, do you want to respond to Javier's comments?

MR. TAM: Give me a minute to think about it. Sorry.

MR. BOZORGCHAMI: Okay. Okay, so stay tuned on that one. We'll come back.

Haile, leave that one on. We'll try to respond to it. If not, we're going to have to contact Dan and directly talk to him about this.

But do you want to read his next comment?

MR. BUCANEG: Sure. Second comment from Dan Johnson at Beyond Efficiency.

"In our compliance work, we have proposed designs with 10 kilowatt hour per year cooling energy, compared to standards at 5 kilowatt hour per year. These are coastal projects. Would these fail based on peak cooling?"

MR. PEREZ: The coastal climates are likely 1, 3,

5, 6, and 7, as well as 2, which is somewhat coastal, but north. The limit that we're looking -- or that we're proposing is for Climate Zones 4 and 8 through 15. And I think that's part of the reason that we're not looking at coastal climate zones, Dan, is that those loads are so small that imposing a limit is likely not necessary.

MR. BOZORGCHAMI: Okay. Thanks, Javier.

I think Dan has got a couple more.

MR. BUCANEG: Yes. Next question:

"Why is the winter 2025 T&D peak in the evening, not in the morning during building warm-up period? What grid loads are driving a winter evening peak?"

MR. PEREZ: Yeah, space heating, the amount of electrification that we're seeing over that 30-year interval, you know, we've got some changes that are happening. You know, 2045 is one of those biggest goals, one of the bigger goals around building decarbonization, and that results in mechanical heating leading to electricity significantly; right? And that period of analysis of the 2025 Energy Code is 2026 to 2056; right? So this is that transitional period where we're beginning to see the back end of those years significantly affect the larger average.

So I hope I'm answering your question. Let me know if you have any follow-up.

MR. BUCANEG: Okay, and the final question from Dan: "If there will be no LSC penalty on summer evenings, then why do we care about this at all?"

MR. PEREZ: I wouldn't say there's no LSC penalty on summer evenings. I would say that, you know, that the peak shifting to winter reduces the severity of that penalty to the point that in some scenarios, and I appreciate Nick's comment about getting into more detail about the scenarios and we'll follow up with that, you know, it leads to doubling or tripling or even more of peak cooling loads, mechanical cooling loads. And that, with trading efficiencies that save heating energy, could still be in compliance.

In other words, you'd have a building that performs fairly well during winters, but during summers could perform very, very poorly. And any time use rates as they are and as they'll continue to be in weather as it's continuing to go, you know, pointing towards summers are continuing to be challenges, both on utility grid as well as on consumers and time-of-use rates. So where LSC doesn't protect those scenarios, that's why we're trying to limit this.

Again, we've isolated this to single-family buildings in Climate Zones 4 and 8 through 15; right? So this is a subset of a subset of California's new

construction building stock. It's not something that's being applicable across the board here.

I do appreciate suggestions to look at hotels and other types of buildings, and I think we will analyze that. Like I said, in the coming months we will have workshops to continue to unpack this and see if we can get on common ground with where we go.

But I think we can all agree that these summers aren't getting cooler. You know, we had our peak event in September of last year during Labor Day. People at the Energy Commission were working, you know, through that holiday weekend. And we're not here to make sure those people can enjoy holiday weekends. The point of that is to say that these challenges exist and they're existing with much more frequency. And where we have an opportunity to ensure that we can limit the effects of these buildings on those challenges, we're going to attempt to do that.

MR. BOZORGCHAMI: Thank you, Javier.

Before we go to Ronnen's question, two other points that he forgot to mention, I'm going to jump in and ask Danny, could you respond to Dan's first comment that he made about the KWs?

MR. TAM: Yeah. Hi. Danny Tam, CEC staff.

Yeah, we don't use kilowatt because that's just, you know, something that happened in an instance. It could

be, you know, just kilowatt power draw in one second, but that's not a unit measurement for energy. We're more concerned about, you know, how much energy, peak cooling energy use over a period, so that's why we use kilowatt hour.

MR. BOZORGCHAMI: Thank you.

And I see Dan has his hand raised. We'll come right back to the raised hands one more time.

I think, Haile, you have another comment from Ronnen, so go ahead.

MR. BUCANEG: Yes. Our last Q&A comment at the moment is from Ronan Levinson at LBNL.

> "Two other points I forgot to mention earlier. One, existing or potential cool envelope measures, for example, reflective roofs, reflective walls, mitigate the urban heat island effect, UHIE, which lowers outside air temperature and thereby provides additional peak demand reduction and energy savings.
>
> And his second point is, "These same measures would also provide global cooling, negative radiative forcing, to offset the atmospheric warming effects of greenhouse gas emissions."

MR. BOZORGCHAMI: Sorry, I've been talking on mute. I apologize.

Thank you, Haile. Thank you, Ronnen, for the

comment, and thank you, Haile, for reading. We will take those into consideration as we move forward.

I'm going to go back to the raised hands, and I think Jon McHugh, I'm going to unmute you, and go ahead and state your name and affiliation. Thank you.

MR. MCHUGH: Jon McHugh, McHugh Energy. Can you hear me?

MR. BOZORGCHAMI: Perfect. Thank you.

MR. MCHUGH: Okay. Great. Yeah.

I wanted to circle back to a couple of comments made by, I think it was Nick Brown and Bob Raymer, talking about flexibility associated with a performance approach. And Nick, you know, was concerned about the flexibility./ And Bob Raymer brought up the issue about, well, are we just talking about envelope? And he gave the example of, for instance, air conditioning units that were highly efficient and then provided flexibility in terms of tradeoffs.

In terms of your definition of peak cooling, are you actually talking about peak cooling loads, or are you talking about peak cooling air conditioning, or essentially summer energy consumption during the 4:00 to 9:00 period? And that energy consumption during that summer period we're calling the peak cooling is actually an energy, you know, is sort of a time-of-use energy consumption during that

period, so it includes both the cooling loads, but then also the efficiency of the equipment that's mitigating those cooling loads. Is that correct, that we're actually looking at energy consumption and not cooling loads per se? Is that correct?

MR. PEREZ: Yeah. Yeah, thanks, Jon. Yes. You know, ultimately, we're looking at the period of 4:00 to 9:00 and mechanical cooling loads. So in other words, if you have a higher SEER or higher EER, then your mechanical system will consume -- will run less in theory, assuming your envelope is sufficient enough to make sure that it doesn't run throughout that entire period; right?

But, yeah, to answer your question, it is about the energy consumption and mechanical cooling system.

MR. MCHUGH: I see. And so as a result, equipment efficiency is one of those tradeoffs that --

MR. PEREZ: Yeah.

MR. MCHUGH: -- will be available through this? Thank you so much.

MR. PEREZ: Yeah, sure thing, Jon.

MR. BOZORGCHAMI: Thank you, Jon. Thank you, Javier.

Next, we've got Dan Johnson. Go ahead and state your name affiliations. And for the first time, please spell your name out.

MR. JOHNSON: Hello, this is Dan Johnson, Beyond Efficiency. We're an energy consulting company. Thank you for responding to my typed questions. That's all clear. Thank you.

I'm a little confused by the nature of this measure. It seems kind of unprecedented in the sense that all energy -- all building optimization up to this point has been to minimize total annual LSC. And if LSC is changing in terms of which hours of the year are most penalized, it seems like we're arbitrarily picking some hours that have no penalty anymore compared to what it used to be and saying, oh, wait, wait, wait, but we still want to incentivize these hours. But if there were a reason to incentivize those hours, why doesn't the LSC continue to weight them? And from the answers given previously, it sounds like, well, there's a divergence now between retail electric rates and actual LSC or grid costs in some sense.

So this is really like a consumer protection measure where we're trying to reduce consumer costs during these hours because they're so divergent from LSC, and so that seems kind of unprecedented. I'm wondering if you could comment more on that?

And then, also, is there a cost effectiveness justification for this? Because costs have traditionally been done in LSC dollars, not consumer retail rate dollars.

So thanks a lot.

MR. PEREZ: Yeah, I mean, setting a standard design to the prescriptive requirement doesn't inherently change the cost of any requirement; right, Dan? We're not requiring a more efficient building than one that meets the prescriptive requirements. And all prescriptive requirements have already gone through that spiel for costs and benefits.

You know, I think one of the things that we're looking towards in 2028, and perhaps you've been an advocate for this, is for the 2028 cycle, we're looking to analyze future or forward-facing weather rather than doing typical meteorological years based on previous 20 years of weather data. I'm pretty sure you may have had comments suggesting that we do this. And I think this is -- this may be, if we are successful in using future weather for 2028, that may dampen or more appropriately recognize the value of summer electrons; right? But absent of that work, you know, this is the position that we're in.

But, Dan, I hope I'm not misattributing the future weather to you. But I feel like that might have been something that you had suggested in the past. And you're still unmuted if you're there.

MR. JOHNSON: Oh, yes, I have suggested future weather. Thanks for pursuing that.

Yeah, I guess it sounds like you're trying to pre-solve for the future LSC time series that we'll have another code cycle.

MR. PEREZ: Well, I would say that, you know, the resiliency issues that we have are real; right? I appreciate that you're focusing on the consumer aspect. And that is one aspect of it.

But, you know, having buildings consume multiple times more electricity than one that meets the prescriptive compliance is something that I think everyone can agree is real problematic. And, you know, over a three-year period, that's maybe somewhere in the 150,000 homes that theoretically might be constructed, assuming construction trends follow where they are. And there's a lot of stakeholders that are affected by that. Obviously, not just those who pay utility bills, but the grid as a whole.

So do appreciate your comment. I agree with you.

MR. JOHNSON: Can I say one --

MR. PEREZ: Please.

MR. JOHNSON: I'm sorry. Can I say one more thing?

MR. PEREZ: Yes.

MR. JOHNSON: In order to pass the Energy Code under current rules, those homes that might have higher peak cooling during 4:00 to 9:00 p.m. for a handful of

hours a year, they would have been optimized to have lower LSC than the standard design in the year as a whole in order to pass code and be built.

MR. PEREZ: Yeah.

MR. JOHNSON: So why are we cherry picking a particular time of year and going outside of the whole LSC construct to impose new conditional requirements?

MR. TAM: This is Danny again.

So as you see on those LSC curves, basically, winter measures way overwhelm cooling measures. So in that sense, just a higher HSPF equipment can trade away really significant traditional envelope measures. So in the near term, that is a significant problem for the homeowner because it would greatly increase their, you know, cost for cooling.

MR. JOHNSON: But the LSC time series that you're feeding to these designers has them designing that building that has higher costs for homeowners. So that's what's really confusing here. I'm sorry, I can't articulate it well enough. You're telling people to design this winter-optimized building under this LSC time series that you've shown. Why doesn't the LSC time series put more penalty on the peak cooling if that's a concern to you?

MR. PEREZ: I think that's the challenge that we're in, Dan. And similar to you, I'm probably not the

best on my feet in some moments, so I do want to recommend that we maybe get a second call and talk through these things. You know, I think this is intended to be a stopgap between now and the next cycle where we do anticipate LSCs will -- if future weather is what we think it might be, it might be reflecting the value of all of these electrons a little bit differently.

But yeah, it's a tough riddle to solve, Dan. But if you don't mind, I would like to maybe schedule a call with you and our team to go over this.

MR. JOHNSON: Sure, thank you for the dialogue. I appreciate it. Thanks.

MR. PEREZ: Thanks.

MR. BOZORGCHAMI: So Javier and Dan and others, let's do a side discussion on this. And Javier, let's invite our consultant team that worked on this, including Danny and Bruce Wilcox, and we could discuss this further with Dan. Thank you.

While talking, I noticed there's a couple more Q&As that came.

Haile, do you want to take over those?

MR. BUCANEG: Sure thing.

First question, Kevin McFadden.

"Following up on the questions from Jon and Dan, does this mean the requirement will be based on total

cooling kilowatt hours consumed between 4:00 to 9:00 p.m.?"

MR. PEREZ: Yes. Yeah, I think that's a pretty clear question.

MR. BUCANEG: Perfect. Thank you, Javier.

And then moving on, Natalie Seblom (phonetic) from AHRI. "Just to clarify, are you deviating from the LSC analysis?"

MR. PEREZ: I'm not sure what that question means. But what I would say is that LSC analysis is done, that work wrapped up in November, so that's still there. That's still the underlying analysis. But again, for single-family in some climate zones, we're looking to set a peak cooling limit.

MR. BOZORGCHAMI: So the numbers are not really changing, the base numbers? It's just that we're --

MR. PEREZ: Right.

MR. BOZORGCHAMI: -- dealing with the peak? Okay. Cool. Thank you.

MR. BUCANEG: And that's it for the Q&A's right now.

MR. BOZORGCHAMI: Thank you, Haile.

MR. BOZORGCHAMI: I don't see any raised hand. I mean, this is an opportunity to ask questions and us trying to make an attempt to answer them. We have until three

o'clock.

Oh, we got one more question that came in through the question and answer, Haile.

But please ask your questions, because we really do want to get this right. I mean, this is one part of the code that we need to get right, so please, or I'll go put a slide on the screen right now.

Or, Javier, if you could move down to your next slide?

You could submit your comments to that one right there. You could submit your comments by October 12. And I think earlier, Javier said that October 12 is just for this workshop and we've still got time. And there's going to be more workshops and discussions on this topic. But let's start asking our questions sooner so we get those answers faster.

I did see one raised hand. Bob, I saw you raise your hand. Oh, there you are. Cool. Thank you. Go ahead, sir.

MR. RAYMER: Yeah. Bob Raymer with CBIA.

Payam, I just wanted to impress upon the Energy Commission how important it is that we get our hands on the updated version of CBECC with the back stops.

MR. BOZORGCHAMI: Sure.

MR. RAYMER: You know, the consul is doing their

analysis but, you know, we tend to focus on the climate zones that are actually the ones having the backstops. So to the extent we can get our hands on that ASAP, it would be fantastic. Thanks a lot, Payam.

MR. BOZORGCHAMI: Sure. Thanks, Bob. Right now, we do have our programmers on the call, too, and they know the dire need for this. They're working. And hopefully, we get this out in the next few weeks for you guys, as Javier says, to kick the tires and ask questions and have a dialogue with us. After this meeting, we will probably do a huddle and try to get to see how fast we can get this program out for everyone to, as Javier says, kick the tires on.

But meanwhile, I saw three Q&As that came up.

Haile, do you want to take those?

MR. BUCANEG: Sure thing. From Natalie Seblom at AHRI. "When will the technical report be published for the peak cooling load proposal?"

MR. PEREZ: I don't have a timeline for that. You know, this is Javier. You know, because this is going to be part of the ACM Reference Manual, it can lag a little bit behind the Energy Code rulemaking process. You know, we hope to have updates here in the coming months, but stay tuned. You know, I think we're expecting to get significant feedback similar to today's workshop; right?

And I think that will feed our analysis and more refine where we land with this. But, yeah, stay tuned. Appreciate the question.

MR. BUCANEG: Thank you, Javier.

From Kevin McFadden. "When selecting a piece of equipment to meet these requirements, is this envisioned to be based on EER or SEER?"

MR. PEREZ: The SEER, both on heat pumps and air conditioners, have federal minimums. So the standard design for SEER will be based on those federal minimums.

For EER and air conditioners, there's a federal minimum. So similarly, there's a backstop there. And that standard design where an air conditioner is simulated will be based on that EER of whatever the federal minimum is, which is to say, if you install an EER that's higher than that air conditioner's federal minimum, then you'll get a credit, right, because EER targets vary depending on capacity.

Now for heat pumps, there is no federal minimum for EER. And the software currently tracks proposed and standard design when it comes to demonstrating compliance with LSC in source or TDV in source energy, right, under 2022. What that means is if you install a system with a heat pump with an EER of 10, then the proposed and standard design are based on an EER of 10.

Now for peak cooling, the same logic will follow through. In other words, for all of our performance metrics, that LSC source and for peak cooling, the EER that's proposed matches the EER that -- the standard design matches the EER that's proposed.

Now having said that, where an EER does go above those federal minimum numbers that we talked about, air conditioners, I think it's 11.2 or 11.7, depending on capacity. If one goes beyond that, let's say you install EER 12 or EER 13, whether it's heat pump or air conditioner, then now there will be a credit, because now you're beyond that federal minimum that is there for air conditioners. And we're trying to make that line be symmetrical across air conditioners and heat pumps for peak cooling, as well as LSC in source.

So, Kevin, that was a long answer to your question. I hope it was clear, but if not, just Javier.Perez@energy.ca.gov is my email address.

MR. BUCANEG: Thank you, Javier.

And finally, from Deborah Gaye-Regi (phonetic).

"When will a recording of this meeting, along with the updated software, be available? Appreciate all that you do."

The recording, historically, we've gotten the recordings the same day as of late. No promises but, you

know, I think that likely can be posted this afternoon on the workshop page.

Your other question has already escaped me.

MR. BOZORGCHAMI: Yeah, the presentation will be available either by tomorrow. And then the --

MR. BUCANEG: The software.

MR. BOZORGCHAMI: -- yeah. And the software, we're hoping within the next two weeks or so. I think earlier on, Javier brought that up. We will be doing a discussion with our programmers to see if we can get that out sooner as possible.

MR. PEREZ: Yeah. And, you know, we've got some really urgent deadlines with the 2022 software, and that's priority one. But this likely should follow shortly after. So again, likely in the two-week window, we hope. But the moment that it gets -- that it's available for download, we'll put a notice on the docket to let anyone who subscribed to the docket know that that software is available for download. So appreciate your patience with that, and stay tuned.

MR. BUCANEG: Thank you.

And we have one more come in from Patrick Riley.

"Besides higher efficiencies, EER and SEER, are there other aspects of the HVAC products that are a trade-off for this requirement, i.e. demand response

capabilities?"

MR. PEREZ: We have a credit for pre-cooling. I don't know very much about it, but Danny might be able to speak to it. You know, duct insulation, obviously, if you have your ducts in unconditioned space, can affect mechanical loads. So where you increase insulation, that can have effects.

But outside of that, I don't believe we have -- your question on demand response, I don't believe we have a credit.

But, Danny, sorry to pick on you. It's the first name that comes to mind.

MR. TAM: Yeah, anything that affects mechanical cooling, low-leakage air handler, increased duct insulation, we do have pre-cooling, but I think that might only reduce the total, not the efficiency. But we can talk.

MR. BUCANEG: Yeah, I think pre-cooling is the only thing we have for single-family. The other demand response items are nonresidential, I believe.

MR. BOZORGCHAMI: Okay. Thank you, Danny. Thank you, Haile. Javier, thank you.

As of now, I don't see any other comments or concerns or questions, either in the Q&A portal or in the participants raised hands. I'm going to give it about

another two minutes or so, let people digest a little bit of this, and see if there's any further questions. If not, there's no other topics for today. This will be the end of it.

But stay tuned. As Javier alluded earlier in his presentation, there will be more workshops as we move forward with the LSC metric and the single-family peak cooling. We will be releasing the 2025 version again here shortly. It all depends on how much work is still left for the 2022. That needs to get out as soon as possible, I think by next week or so. And the programmers will be directing their focus and trying to get the 2025 version for you folks here right after.

While talking, I noticed that there was one more Q&A that came up, Haile.

MR. BUCANEG: Yes, from Steven -- Steve Strawn. "Thanks for the update today, and look forward to continued discussion."

MR. BOZORGCHAMI: Wonderful. Thank you, Steve. Yeah, you have my number on speed dials, so I'm more than happy to talk to you.

With that, and I don't see any other comments or any other raised hands or concerns or questions, again, it's not the end. You've still got time, October 12, to submit your comments to our docket. And we will be taking

those seriously. And we will be reviewing and coming up with a solution. And, also, we will be posting the program here shortly.

With that, thank you for your time.

MR. PEREZ: Thanks, everyone.

(The workshop adjourned at 10:29 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 11th day of October, 2023.

MARTHA L. NELSON, CERT**367

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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 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.

I certify that the foregoing is a correct transcript, to the best of my ability, from the electronic sound recording of the proceedings in the above-entitled matter.

MARTHA L. NELSON, CERT**367

October 11, 2023