DOCKETED	
Docket Number:	24-BSTD-01
Project Title:	2025 Energy Code Rulemaking
TN #:	256840
Document Title:	Transcript for April 17, 2024, Lead Commissioner Hearing on 2025 Building Energy Efficiency Standards
Description:	This is the transcript for day 2 of 3 of the Lead Commissioner Hearings on the 2025 Building Energy Efficiency Standards.
Filer:	Javier Perez
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	6/13/2024 10:59:22 AM
Docketed Date:	6/13/2024

CALIFORNIA ENERGY COMMISSION

In the matter of:

Lead Commissioner Hearings for the 2025 Building Energy Efficiency Standards	) Docket No.	24-BTSD-01

CEC LEAD COMMISSIONER HEARINGS ON

2025 BUILDING ENERGY EFFICIENCY STANDARDS

VIA VIDEO AND TELECONFERENCE

VOL. 2

TITLE 24, PART 6

WEDNESDAY, APRIL 17, 2024

9:00 A.M.

Reported by:

Chris Caplan

APPEARANCES

LEAD COMMISSIONER

J. Andrew McAllister

PRESENTERS

Payam Bozorgchami, Deputy Director of the Energy Assessments Division

Javier Perez, Project Manager, Building Standards Branch

Joe Loyer, Senior Engineer, Standards Compliance Branch

Haile Bucaneg, Lead on Covered Processes, Building Standards Branch

Ronald Balneg, Mechanical Engineer, California Energy Commission

Simon Lee, Engineer, California Energy Commission

Bach Tsan, HVAC Systems and Refrigeration, Building Standards Branch

Muhammad Saeed, Senior Electrical Engineer, Building Standards Branch

CEC STAFF

Danny Tam, Associate Mechanical Engineer, Building Standards Branch

Michael Shewmaker, Supervisor, Standards Development Unit

Cheng Moua, California Energy Commission

PUBLIC COMMENT

Christopher Ruch, National Energy Management Institute

APPEARANCES

PUBLIC COMMENT (cont'd.)

Kurt Hurley, City of Berkeley

Marina Blanco, Gabel Energy

Gina Griffiths Rodda, Gabel Energy

Kelly Cunningham, Pacific Gas & Energy

Jon McHugh, McHugh Energy

Skip Ernst, Daikin Comfort Technologies

Ted Tiffany

Meg Waltner, Natural Resources Defense Council

Jonny Kocher, Rocky Mountain Institute

Hassan Fawaz, Green MEP

Anne Pernick, SAFE Cities, Stand.Earth

Blake Herrschaft, Peninsula Clean Energy

Jeff Whitelaw, Daikin Comfort Technologies

Bob Raymer, California Building Industry Association

Bronte Payne, SunPower

Jeremy Zeedyk, National Energy Management Institute

Hwakong Cheng, Taylor Engineers

Melissa Yu, Sierra Club

INDEX

INDEX

P R O C E E D I N G S

9:05 a.m.

WEDNESDAY, APRIL 17, 2024

MR. BOZORGCHAMI: So good morning. My name is Payam Bozorgchami. I'm one of the Senior Engineers who works on the Building Standards Branch in the Efficiency Division here at the California Energy Commission.

Before we get started with these hearings, I just want to let everybody know that these hearings are being recorded and they will be transcribed. The recordings and the transcripts will be available on our docket here shortly.

So with that, I would like to let you all know also that Commissioner Andrew McAllister is the Lead Commissioner over the 2025 Building Energy Efficiency Standards, and he will be leading these hearings. He's running a little bit late this morning, so we're going to move -- after I do my little quick introduction, then we're just going to move on to Javier Perez, our Project Manager for the 2025 Standards, and he will give you guys the rulemaking introduction to how we developed the 2025 Energy Codes.

But before we start, like all other hearings, we have to go through some housekeeping rules. Again, these

hearings are being recorded and transcripts of these hearings will be available shortly. But what we're going to do -- we're going to do the presentation. The subject matters and the presenters are going to do their presentations.

And after every presentation, we'll open it up to public comments or questions. And then to do so, you just have to raise your hand. In the Zoom, there's that feature there. Or if you're on phone, hit star 9, and it automatically raises your hand, and I know that someone needs to -- wants to make a comment. And I will from my side unmute you, and when I do that please state your name, your affiliation, and also, if you can, spell your last names. I apologize. Like I said our court reporter is taking the best notes that he can, but we need that information for our records.

To be able to capture everybody we're going to allow about a two-minute comment period time where you can provide your comments or concerns or, if you have any, questions.

Today's agenda: I am Payam. Payam will give you guys a quick general overview of the discussion today. Then we have Commissioner McAllister, who will be doing the opening remarks.

Unfortunately, he's running a little late, so

we're going to jump right into Javier Perez, who will do the rulemaking introductions and how we developed the 2025 Energy Codes.

Haile Bucaneg, our Senior Mechanical Engineer, he will be presenting on the cover processes. We'll take a quick break.

Then Ronald Balneg, our Mechanical Engineer here at the Energy Commission, will be presenting on the nonresidential mechanical mandatory measures.

Then we have Simon Lee, who's going to be presenting on the lighting provisions for nonresidential buildings. We'll take a -- depending on how far we get, we might take a 45-minute or an hour lunch break.

Then we'll come back. We will have Bach Tsan, our Senior Mechanical Engineer, talk about the nonresidential buildings envelope and mechanical measures.

And depending on how fast that goes, or if we get done sooner, then about 2:15ish or so we'll jump right talking about the nonresidential photovoltaic and Battery Energy Storage Systems. And Mohamed Saeed, our Senior Mechanical -- excuse me, Senior Lighting Engineer will be presenting on that. And I said lighting. I apologize. I meant Senior Electrical Engineer. I apologize for that.

And then Commissioner McAllister will give a quick presentation and do the closing remarks. But prior

to doing that -- after doing that, I will come back on and we will open up today's presentation -- or hearings for any comments on today's, what you heard today, or on anything else that you want to express on the 2025 Energy Codes.

And if we don't get to you today, don't worry. There's still opportunity to provide comments and concerns and questions. Here's the information. You can always submit your comments to the Energy Commission. Due date for these hearings are May 13th by 5 p.m. and the information and the docket information is right there, and you can provide your comments in writing.

And in doing so, I encourage people to provide their contact information, either their phone number or email. And please, do not put anonymous. Unfortunately, the reason we say not to do that is because you may have a great comment, or great information, and we need to touch bases with you, and we need to know how to do that. If you just put Javier Perez, I don't know how to get a hold of Javier Perez. So please provide contact information.

Also, I put on this slide our Public Assistance -- or Public Advisors information, her name's Mona Badie -- she's a public advisor here at the Energy Commission -- her contact information, and the website for the public advisory. Here she's more than happy to assist you with any information you need about the Energy Commission, our

process, how we do things, who we are, and any contact information that you would need. So that's there.

Please don't -- if you're not happy or you're not comfortable commenting today, please provide your comments by May 13th. The sooner the better so we can do a proper job of evaluating, and the docket information is right there.

This presentation and the other two will be posted on our docket hopefully by Friday. We've just got a lot to do the next three days -- or next two days, sorry. And we'll get to these as soon as we can and you will get them on our website and our docket by Friday.

Sorry. I'm having a little bit of a computer issue. It's not wanting to change slides. There we go.

So today's hearing -- yesterday's hearings was a hybrid hearing where we had participants here at the Natural Resources Agency building in-person, and we also had the Zoom meeting going on.

Unfortunately, today we were not able to get a room. So everybody, we're doing a Zoom call. I'm hoping nobody's showing up at the Energy Commission or the CNRA building because there's not happening -- there's no meetings happening in-person.

Tomorrow, April 18th, we will be back to normal hybrid. So you can either come to the Energy Commission

and meet with us and sit with us and go over the presentation, or you could be on Zoom. And these are the topics that we're going to be discussing, the single family residential buildings and the multifamily buildings.

We've been recently getting a lot of recommendations in the -- for the 2025. Unfortunately, we're a little bit late in the cycle. So we recommend if you have any suggestions or any ideas of measures that's going to help energy efficiency or carbon reductions, please provide those information or that idea to Title24Stakeholders.com. Right there below on the lower left of the screen, you will see the information and where you can place that, your comments and concerns. We will evaluate those, we will reach out to you, and get further details from you, and we will consider those for the next code cycle, which is on a triennial basis. That will be the 2028 system.

Again, you're going to see this screen over and over again. If you have comments from today's hearing or other concerns, or other things that you maybe even heard yesterday or you might hear tomorrow, please, you have until May 13th by five o'clock. And here's the website to where you can submit your comments into our docket. Thank you.

That's all I have, and we're going to not wait

for Commissioner McAllister, as I said, so we're going to have Javier Perez do his discussion and presentation on the process of developing the 2025 Energy Codes. Thank you.

MR. PEREZ: Thanks, Payam. Can you hear me okay? Great. Alright.

Hi. My name's Javier Perez, and I'm the Project Manager for the 2025 Standards. Today I'll briefly go over our authority and process, some drivers behind the 2025 Standards, and the underlying energy metrics of our code, and finally some timelines for the 2025 Update.

And if you attended yesterday, apologies, it's generally a repeat, but you'll only have to hear it one more time if you attend tomorrow.

But I do want to take a second to thank you all for taking time out of your day to participate in this hearing, and really hope that through this participation, through your collaboration with us, that we can continue to make great strides in terms of energy efficiency and long-term State goals with this 2025 Standards Update.

Next slide.

Alright. Let's start with the Energy Commission's authority and process. This slide is a 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 Energy Standards on a triennial basis and for local jurisdictions to enforce these Standards through the building permit process. The Standards were developed at the discretion of the Warren-Alquist Act to reduce wasteful, uneconomic, inefficient, or unnecessary consumption of energy.

On the right, you'll be 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 California's 2022 Energy Codes requirements in green. Now, if you only take a few points away from this graph, they should be that averaging across all Climate Zones, single-family buildings built to California's Energy Code use an estimated 52 percent less energy than those built to the 2021 IECC.

And while our buildings are becoming increasingly more efficient over time and outpacing national standards, our buildings' natural gas consumption, the light green segments of the bars, are a large portion of our building's overall energy consumption. Our State has lofty greenhouse gas emission reduction goals and reducing emissions from buildings will be one of the many keys to meeting those

goals. Our State also has clean energy requirements for electricity retail sales over the next couple decades and that will make electricity significantly cleaner over time.

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 at the link below.

Now let's talk about those state-level drivers and some of the themes of the 2025 Energy Code. We're obligated to contribute to the State's greenhouse gas reduction goals, and one of those being Governor Brown's Carbon Neutral Executive Order to achieve carbon neutrality by 2045. Another driver is 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. This will make electricity significantly cleaner over time and will also have substantially positive impacts on the State's greenhouse gas reduction goals. The Energy Code is tasked with contributing to these goals, and must do so by increasing building energy efficiency requirements, all while proving the Standards to be cost-effective and technically feasible.

Now, what are some of the strategies employed with the 2025 Updates to contribute to these State goals? Well, building on the efforts of the 2022 Code cycle, we've

continued to explore where highly efficient heat pumps could be introduced as the prescriptive baseline for space and water heating systems, and you'll hear some of those proposals today and tomorrow. In 2019, we introduced solar photovoltaic system requirements for low rise residential buildings, and in 2022 we introduced similar requirements for some nonresidential, high rise residential, and hotel/motel buildings, and also added energy storage system requirements. And in 2025 we look to expand where these systems could be deployed cost-effectively, and update our requirements to ensure that we're in step with the evolving landscape of photovoltaic and energy storage systems.

Now for the purposes of the Energy Code, a process is an activity or treatment that is not related to human occupancy, and the 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 looked at these systems to find efficiencies where possible. We wanted to ensure that our Standards continue to serve as protection for affordable housing because 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 looked at affordable housing programs and the compliance tools that they use and

streamlined 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.

As with all Code cycles, existing buildings continue to be a focus of the Energy Code, and this cycle we also took a stronger look at smaller homes or ADUs and how our requirements fit for those smaller dwellings.

And we 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 to support their efforts in CALGreen, or Part 11 of Title 24, as they relate to embodied carbon and electric vehicle charging.

And finally, one thing that's not listed here is our never-ending intent to make this Code easier to understand, to make compliance with our Code simpler, and to make enforcement of the requirements of our Code easier. I don't know if we'll ever get this right, but if we don't, it won't be for lack of effort.

Next slide.

Now let's go over our underlying energy metrics that help determine energy savings. For the 2025 Energy Code cycle, we're pivoting from using the term 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 the development and implementation of the Energy Code. LSC factors are used to convert predicted site energy used to long-term dollar costs to California's energy system. The underlying varying valuation of energy, depending on the time of the day and day of the year, that was used for TDV has not changed, but we've converted those energy savings into Long-term System Cost savings to better reflect the actual cost of energy to consumers, to the utility system, and to society.

This graph represents an average day's dollars per megawatt hour, and how those costs vary by time of day, and the different inputs that go into that cost.

Next slide.

The Source Energy metric was introduced during the 2022 Energy Code cycle and is defined as a 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 demand-side energy consumption, and they calculate Source Energy for a given hour. The value in that hour for each forecasted year is averaged to get a lifetime average Source Energy.

Next slide.

Now, because a building's energy use can vary depending on weather conditions, which differs throughout the State, the Energy Commission has established 16 Climate Zones representing distinct climates within California. This is not new for this cycle, but hopefully it serves as a refresher if you're already up to speed on California's Energy Code. As a result of having 16 Climate Zones, requirements can vary significantly from zone to zone, since when energy savings vary, measures can be found to be more or less cost-effective.

Next slide.

Now, let's go over how far we've come in this code cycle.

From June of 2021 to July of 2023, the Codes and Standards Enhancement Team, or the CASE team, took in measure proposal ideas, held 19 different public workshops on those measure proposals, and finalized reports for those proposals. From March to November of 2022, the Energy Commission updated weather data and LSC and Source Energy metrics. And from March of 2023 to September of 2023, the CEC held nine pre-rulemaking workshops on the proposals for the 2025 code, culminating with the publication of the draft express terms in November of 2023.

After that, in the recent weeks, on March 29, we

produced our 45-day rulemaking language and opened the 45-day comment period that goes from March 29 to May 13.

Next slide, please.

Now, something that we feel is important to highlight is the amount of stakeholder input and engagement that went into these updates. Over 60 different stakeholder groups participated in every step of this cycle, from measure intake ideas to vetting of proposals to providing feedback on Code language. These groups included everyone from energy consultant groups, multiple great organizations, building industry leaders, and advocates, including environmental and ADU advocates. This level of participation is crucial to the development of this Code, and we very much thank you for your continued engagement.

And we're having a little bit of challenge with the slides right now, so hang tight and I'm going to try and share my screen and see if we can keep the show going. So apologize for the inconvenience here. Just give me maybe five to one minute.

(Pause.)

Still working here. Just bear with me. Appreciate your patience. Okay. We're almost there. We're almost there. Thanks for your patience. You know, technology.

No? Okay. Alright. It's going to be a few more

seconds. Really apologize about this. Almost there. Zoom. Share screen.

Okay, Mikey, can you do me a favor and let me know if you see my screen?

MR. SHEWMAKER: Yeah. We're seeing it.

MR. PEREZ: Thank you very much. Okay.

Now what is to come? You know, we opened our formal rulemaking 45-day common period on March 29th, and like I said earlier, March 29th to May 13th is that period. We're having our three-day lead Commissioner hearings yesterday, today, and tomorrow. Thanks again for your participation. And we plan on holding our 15-day comment period in June, and we expect to adopt the 2025 Energy Code in the August 14th Business Meeting.

The Building Standards Commission will then have their Commission meetings to approve updates to all parts of Title 24 in December of 2024. We'll continue to iterate on the manuals, the software, and the forms update from between July and March of 2025, so stay tuned for more on that in the coming months. The effective date of the 2025 Energy Code will be January 1, 2026.

Alright. Let's see if we can get it to go to the next slide. There it is.

Okay, and my last slide. For this code cycle, this is the list of senior staff for the Building Standards

Branch at the Energy Commission, and if you're as bad at names as I am, my name is Javier Perez. I'm the Project Manager for this 2025 cycle. Payam Bozorgchami is our Technical Lead who's frantically working on the technical side right now. He specializes in building envelope additions and alterations to existing buildings and accessory dwelling units, or smaller dwelling units, and he's really the backbone of everything we do. Haile Bucaneg is the Lead on Covered Processes, demand response controls, and our nonresidential and residential alternative calculations method work. Mohammed Saeed is our Solar PV and Energy Storage Systems Lead, and Bach Tsan is our Lead on HVAC Systems and Refrigeration. Michael Shewmaker is the Supervisor of the Standards Development Unit, and Gypsy Achong is a Branch Manager for the Bulding Standards Branch. If you'd like to reach out, our email convention at the Energy Commission is just first name dot last name at energy.ca.gov.

And our goal is to build consensus through these workshops and this public process, and your participation, you know, your comments, they all go a long way to help with that goal. So thanks again for making time today. You know, we've had over 60 groups, you know, participating from many different stakeholder groups. And I think we do hope to continue this engagement, and hope we can agree

everywhere, but maybe where we can't agree, at least we can see eye to eye and get reasonable consensus.

So with that, I do want to thank you for your time, and I'll see if Payam's ready to take it back. Otherwise, we'll just go straight to Haile.

Thank you very much.

MR. BOZORGCHAMI: I apologize. I'm not sure what happened with my computer, but I think I'm back on. I'm going to share my screen.

Give me one second.

And Commissioner McAllister's running a little late, so -- as I said earlier. So can you guys see my screen?

And so we're going to have Haile Bucaneg present on the Covered Processes during break. Hopefully Commissioner McAllister will be present, and he will do his quick introduction.

These are still considered the Commissioner Lead Hearings, as one of his Commissioner advisors is on the call right now, and he's taking notes, and he will relay the message to Commissioner McAllister as needed.

Also, one thing I did forget to say during -- after each presentation, if you raise your hand within your system, I will unmute you. State your name and affiliation. And also we do have the Q&A port open too, so

if you submit -- if you don't want to -- if you want to type something down, we do have staff member Mikey Shewmaker, he's one of our supervisors. He will be reading those out here publicly also.

So with that, Haile?

MR. BUCANEG: Sure.

MR. BOZORGCHAMI: It's a comment, and I will take that. It's from Heidi Werner, and she's actually providing us the link to the stakeholders.com. I will update the slide and put that link in there, and then we will have that available for THE public to be able to submit their suggestions for the 2022 Standards here shortly.

MR. BUCANEG: Okay. Perfect.

Good morning, everyone. My name is Haile Bucaneg, and thank you all for joining us in these Lead Commissioner hearings. During this presentation I will be going over several Covered Process measures.

Next slide, please.

First, I will be discussing Covered Process pipe insulation requirements in the 2025 Energy Code.

Next slide.

Section 120.3(a) has been updated to support the addition of process heating and process cooling piping in pipe insulation requirements, and provide description for what qualifies as process heating and process cooling

piping. Table 120.3 was separated into two tables. Table 120.3-A focuses on pipe insulation requirements for heating systems, including process heating, and Table 120.3-B focuses on pipe insulation requirements for cooling systems, including process cooling.

Next slide, please.

Section 141.1(d) includes requirements for process piping insulation in addition and alteration projects. Specifically, newly installed process piping as well as process piping that is relocated as part of an alteration project will need to meet piping insulation requirements in Section 120.3.

Next slide.

To support these pipe insulation requirements, the definition for Covered Processes in Section 100.1 is also updated to include process heating and cooling piping to support requirements for Covered Process pipe insulation.

Next slide.

The next two slides I'll be going over will be covering controlled environmental horticulture.

Next slide, please.

Section 120.6(h) is applicable to new construction, and in this section, horticultural lighting for indoor grows and greenhouses are now covered under a

single horticultural lighting requirement. This requirement is a mandatory minimum photosynthetic photon efficacy of 2.3 microjoules -- micromoles per joule.

Next slide.

For addition and alteration projects, the language was cleaned up and references updated, and as in Section 120.6(h), the horticultural lighting language for indoor grows and greenhouses were combined.

Next slide.

Next we will be going over some updates associated with commercial kitchens.

Next slide.

Section 120.6(k) is applicable.

Oh, I'm sorry. I'm on the wrong side here.

Section 120.6 is an electric readiness requirement, and was added for newly constructed commercial kitchens. These will apply to quick service and institutional commercial kitchens. Branch circuits shall be rated at 50 amps minimum and have a service capacity of 800 connected amps. Main electrical service panels must be sized to accommodate either 208-volt or 240-volt 50 amp breakers.

Next slide, please.

Three different commercial kitchen definitions have been added to help identify different types of

establishments. These are Full-Service Commercial, Institutional Commercial, and Quick-Service Commercial kitchens.

Next slide, please.

I will now be moving on to refrigeration requirements, and these are primarily for refrigerated warehouses.

Next slide.

And Section 120.6(a)3D identifies specific efficiency requirements for evaporator equipment. The description of evaporator-specific efficiency is the gross total refrigeration capacity divided by electrical input power at 100 percent fan speed, and is also included in Section 120.6(a)3D. Section 120.6(a)3E includes a maximum static pressure drop for the evaporator, and this is to ensure that savings from identified efficiencies are realized. Both Section 120.6(a)3D and Section 120.6(a)3E include exceptions for quick chilling and quick freezing products.

Next slide.

Table 120.6(f) provides the minimum specific efficiency requirements for evaporators serving refrigerated warehouses. These efficiencies are dependent on the type of evaporator that is being used, as seen here. So you can see that the efficiencies are based on whether

this is cooling or freezing, and on the type of refrigerant that's used.

Next slide, please.

To support refrigerated warehouses efficiency requirements -- refrigerated warehouse efficiency requirements, the definition for AHRI 420 was also added into Section 100.1.

Next slide.

The final part of this presentation will focus on laboratory requirements.

Next slide, please.

Airflow reduction requirements in Section 140.9(c)1 have been updated in a couple of ways. First, the airflow reduction requirements are now applied more broadly and not limited to laboratories with circulation rates of 10 air changes per hour or less. Second, an occupied minimum exhaust airflow rate and an unoccupied exhaust airflow rate must be determined. The occupied minimum exhaust airflow rate must not exceed 1.0 cubic feet per minute per foot squared, and the unoccupied minimum exhaust flow rate must not exceed 0.67 CFM per foot squared. However, the airflow rates may be higher if code accreditation or health and safety requirements require greater rates. Additionally, higher airflow rates may be used if they are needed to maintain pressurization.

Next slide, please.

Section 140.9(c)3, which deals with fan power system consumption requirements, has been updated in a number of ways. Exhaust air and exhaust fan system airflow rates were clarified by providing examples of what is included in each. References to the American National Standards Institute laboratory ventilation standards were updated. And an option for meeting the fan power budget process described in Section 140.4(c)1 was also added. This option would require the fan system electrical power input does not exceed the fan power budget.

Slide please.

Laboratory exhaust system controls requirements in Section 140.9(c)3D were updated to ensure that energy savings occur when this option is taken. This includes a minimum difference between the occupied minimum circulation rate and the system design airflow rate. A maximum fan power is included for these options as well. These requirements are included to ensure that if this option is taken, the system will typically operate at a lower airflow rate and not always run at higher design airflow rates.

Next slide, please.

Continuing on with exhaust system controls in Section 140.9(c)3Dv, the wind responsive controls and contaminant monitored controls are still available options.

An additional option of simple turndown controls based on 60 percent of the exhaust fan system design airflow rate has been added.

Next slide, please.

Section 140.9(c)5 adds new reheat limitation requirements for laboratory exhaust systems. This reheat limitation requirement applies to air handlers in buildings with more than 20,000 CFM of laboratory exhaust, and that serve multiple laboratory space conditioning zones. There are some exceptions here to address humidity concerns, certain biosafety conditions, and specifically for vivarium spaces.

Next slide, please.

Section 140.9(c)6 adds requirements for exhaust air heat recovery. This is applicable for buildings with more than 10,000 CFM of laboratory exhaust. The exhaust air heat recovery system must provide a sensible energy recovery ratio of at least 45 percent at heating design conditions, and of at least 25 percent at cooling design conditions. The system must recover energy from at least 75 percent of all lab exhaust air, and also have the ability to be disabled. There are several exceptions to this requirement, such as around Climate Zone 6 and exhaust systems that require washdown systems.

Next slide, please.

Section 141.1(a) was revised to remove redundant language. Additions and alterations of laboratories should meet requirements in Section 140.9(c). Reference to exhaust system flow rates was removed from 140.1(a) since these are flow rates -- these flow rates are identified in Section 140.9(c) already.

Next slide, please.

The construction inspection and functional testing requirements located in nonresidential appendix NA7.16 have been updated based on the laboratory exhaust system code requirement updates. This includes adding new construction requirements to construction inspection and functional testing procedures for occupancy controls and simple turndown controls. The procedures for wind, responsive controls, and monitored contaminant controls have also been updated based on minimum airflow rates and system power requirements. Overall, these testing requirements are included to ensure the system can be turned down as needed, and that power usage requirements at lower airflows are met.

Next slide, please.

And that's it for the information on the Covered Process.

I believe we can open it up for questions.

MR. BOZORGCHAMI: Thank you, Haile.

Questions?

I have one raised hand. Christopher, go ahead and state your name and affiliation, and please put your last name.

MR. RUCH: Sure. Christopher Ruch. I'm with NEMI. That's R-U-C-H.

Thank you for the presentation there. The question I had was just on the -- the most -- what you just went over with the laboratories. And you talked about at the end there being some acceptance tests there.

Just to clarify, are there going to be added acceptance tests for the ATT in that case, that would be verifying that these systems actually work the way they're supposed to?

MR. BUCANEG: Yeah. I would need to go back and double check who would be responsible for the testing there, but I believe so.

MR. RUCH: Yeah. I just would encourage you to make sure that the -- whosever going to be verifying that, you know, does have the qualifications for it. You know, whereas the ATT is in very -- in many cases, especially when you look at, like, a level two, an ATT level two that the ATTCPs have, such as NEMIC, you're looking at someone who's TAB-certified. That would be the right person to test that type of system to verify that it's working.

MR. BUCANEG: Thank you, Chris.

And yeah, that's a good point, so -- and if you can submit that comment, that'd be great, so I can make sure that we consider the certifications of those testers and make sure it's clear in the appendix landing.

MR. BOZORGCHAMI: Yeah, I think -- this is Payam -- I think we're going to have to talk to Joe Loyer and make sure that's in there. Okay. We will do that.

Thank you, Christopher.

MR. RUCH: Thank you.

MR. BOZORGCHAMI: Kurt, please state your name and affiliation, and spell your last name, please, sir.

MR. HURLEY: Yes. My name is Kurt Hurley. My affiliation is with the City of Berkeley. The spelling of my last name is H-U-R-L-E-Y.

And my question for Christopher on 120.6(k), the commercial kitchen electric readiness -- I did make a note here. It mentions -- the exact language is the connected service capacity. Now I'm wondering if the plan is to use a similar language that was adopted for the EV-capable space where there's service panel capacity, because you -- maybe you were just putting the slide deck together quickly, and you didn't include the word service panel, but, you know, there's a whole chain. There's a whole sequence of things that are impacted in other codes. So,

is that the intention, is to make it sort of a sibling requirement to the way the wording of the EV-capable space is? Where there's space physically, there's the electrical service capacity, you know, and ultimately we need electric load calculations in the building.

MR. BOZORGCHAMI: Kurt, thank you for that comment. Let me see if Ronald Balneg -- is he available to answer that question?

MR. BALNEG: Yeah. Hi. This is Ronald Balneg.

I'm sorry, could you repeat the question?

MR. HURLEY: Would you like me to repeat the question? So in -- so, Christopher covered the 120.6(k), and I apologize if I have many things open my screen -- but yeah, 120.6(k). So, this is a Mandatory Requirement for commercial kitchen electric readiness. As I go down the bullets, and I'm looking at my screenshot here, it says service capacity, 800 amps connected. So there's some nuance there.

I guess what I'm wondering is, I really liked the wording for the EV-capable space. And of course, that's not in the Energy Code, that's CALGreen. But, you know, it's very specific about space in the service panel, the service panel has that capacity. So, I'm just wondering if you're going to coordinate with that, because I think that was well done.

That's my question.

MR. BALNEG: Oh. Okay. Yeah. I appreciate that comment.

Yeah, I can take a look at that. Please submit a comment as well --

MR. HURLEY: Okay.

MR. BALNEG: -- on the docket.

MR. HURLEY: Let's see. I can try and -- let me, I have the 2022 CALGreen. I can give you that reference section. It's in 4.1 -- of course, this that I have is not the mid-cycle supplement, but you'll see the wording.

MR. BOZORGCHAMI: Yeah. I understand what you're saying, Kurt. I think we need to adjust --

MR. HURLEY: Yeah. Sure

MR. BOZORGCHAMI: I think we just have to align that language --

MR. HURLEY: Yeah.

MR. BOZORGCHAMI: -- to coincide with what's in the -- yeah.

We've got to do that. We'll take care of that.

MR. HURLEY: Okay. Of course. Thank you so much, and I'll leave the time for other questions.

MR. BOZORGCHAMI: Yeah.

MR. HURLEY: Appreciate your work.

MR. BOZORGCHAMI: Thank you for that comment.

That's a good catch. Thank you. That's an edit and we're going to have to fix.

Any more comments? Questions?

If not -- I don't see any other raised hands -- so, I'm going to see -- Michael, do we have any Q&A that we need to discuss?

MR. SHEWMAKER: No. We have no open questions in the Q&A at this time.

MR. BOZORGCHAMI: So nothing. Okay.

Unfortunately, so, again, if you guys -- if you folks come up with ideas and comments on what you just heard, here's the link. Again, you'll see this, like I said earlier, you'll see this page over and over again, and please provide your comment by May 13th at 5pm.

For now, we're going to have to take a quick 15 minute break. I want to see if Commissioner McAllister is in the building now. If so, we will go to him, then we'll come back and Ronald Balneg, our Mechanical Engineer, will discuss the nonresidential buildings requirements for mechanical and mandatory measures.

So, now let's take a quick 15-minute break and let's reconvene at 10:05. Thank you.

(Hearing went to break at 9:49 a.m., returning at 10:05 a.m.)

MR. BOZORGCHAMI: Hi everyone, we're back. This

is Payam.

We're going to do an extra maybe four minutes in the break. We're having a little bit of a computer glitch issue. We're trying to resolve that. Bear with us. I apologize.

And hopefully we can get Commissioner McAllister on the call also. Sincerely apologize.

(Pause for four minutes)

MR. BOZORGCHAMI: Hello again. And I really apologize for the computer glitches we're having today. I think we resolved the issue.

And at the same time, Commissioner McAllister was able to make it to the hearing. So before we go to Ronald, who's going to be discussing the mandatory measures for nonresidential built -- mechanical systems, we're going to have Commissioner McAllister.

Would you like to give a few words?

COMMISSIONER MCALLISTER: Great. Well, thanks a lot Payam. I really appreciate it. And thanks to everyone for being with us for a second day.

I actually had a slight conflict this morning. I was speaking to AHRI's board meeting, they're sort of member meeting that they're having in Sacramento right now. So it was kind of fortuitous, actually, that they were in the city today as well. So apologies for having to have a

little bit of a conflict for the first part this morning, but understand that things are going well.

And, you know, just want to again encourage everyone to put in their comments verbally today and tomorrow, and also written comments going forward. So obviously, you have all the details for how to submit on the docket. But again, the Public Advisor can help if you're having issues there.

So today a lot of, you know, important issues. You know, you've heard from Haile, and then next you'll hear from Ronald Balneg and Simon Lee on mechanical and then lighting, and then from Mohamed Saeed on PV a little bit later, after the envelope and Bach Tsan. And then Mohamed Saeed on the PV.

So all of those issues, you know, are -- they have their complexities, and we've had already leading up to the proposal that we're talking through these days a lot of interaction with stakeholders, a lot of great analysis on the Commission staff, and that analysis has benefited immeasurably from interaction with expert stakeholders like yourselves. So want to just keep that going, making sure that we're dialing in getting those final details. You know, if we missed anything, definitely appreciate folks bringing that up and sort of explaining -- you know, raising the flag on issues you believe are important that

need a little bit further attention. So that's what the 45-day language is for, is to, you know, dial in, do those tweaks that get it to be both technically sound and usable out there in the world. So we really are excited to have everybody together.

And, you know, again, as I think, you know, I said yesterday, the Building Standards really are the bread and butter of, you know -- they're one of the core responsibilities that we have here at the Energy Commission, and have had since its inception back in the 70s, and is a core pillar of our decarbonization journey now as well. So it couldn't be more important. Buildings are where we spend all of our time, 90 percent of our time, and consumes about, you know, 40 percent of our energy and accounts for about 25 percent of our -- roughly a quarter of our emissions, our carbon emissions. So they have to be healthy, they have to work well, and they have to be low-carbon footprint. And so that's what we're trying to accomplish here, and really with a long-term vision of getting to zero.

So again, thanks everybody for being here. I really appreciate all the staff, those that are presenting today, and also the teams behind them that have really over the last two-and-a-half, three years, you know, put, you know, shoulders into the rowing to get this big ship moving

where it needs to go.

So thanks. Thanks again, everyone.

And back to you, Payam.

MR. BOZORGCHAMI: Thank you, Commissioner. Before we start, I noticed there's a raised hand.

Thomas, I'm going to unmute you if you have a question or concern.

(Pause.)

Hello? Thomas?

No. Okay, so we're going to move on, and we're going to move on to Ronald Balneg he's going to be talking about the mechanical mandatory measures.

Ronald?

MR. BALNEG: Hi everyone. My name is Ronald Balneg. I'm a Mechanical Engineer here at the Energy Commission. We're going to be going through the 120 to 120.9 nonresidential mandatory measures.

Next slide, please.

So in Section 120.1(c)2, this is the natural ventilation section. We're going to have some editorial changes, such as updating the ASHRAE 62.1 references to the 2022 version. Other editorial changes: we're going to be moving some of the requirements around to make them more explicit, such as the requirement for mechanical ventilation.

Next slide, please.

The mechanical ventilation requirements are also undergoing some editorial changes. We're changing the language to be a little bit more clear by implementing the Area versus Person method of ventilation rates. In line with this, in Table 120.1-A, we have also made changes to include those Area-based Rates and Occupant Load Densities for this Area versus Person method of ventilation calculation. These values were back-calculated later from the 2016 ventilation tables, and so they should not change the ventilation rates.

Next slide, please.

In 120.1(c)2 -- this is the occupied standby -- Occupied Standby Zone Controls, apologies. And the Occupant Zone Controls have been rewritten to make the requirements more clear, and we have listed some examples of what spaces must meet those requirements. And in Table 120.1-B, this includes some new rates, and these will also be in line with that referenced ASHRAE 62.1.

Oh, I'm sorry, could you go back one slide? Yeah. Sorry, Payam.

Sorry. let me start over.

So this section is the -- or this slide is for the Occupied Standby Zone Controls. So the zone controls have been rewritten to make the requirements more clear,

and we have listed examples of what spaces meet these requirements. In Table 120.1-B, this includes some new rates, and we're changing -- or we're including these new rates to be in line with ASHRAE 62.1 2022 tables.

Next slide, please.

This is in 120.2, the HVAC hot water temperature. So these are new Mandatory Requirements for zones that use hot water for space heating. and we're limiting this to 130 degrees Fahrenheit.

Next slide, please.

120.5(a)4, Mechanical System Acceptance Test. Again, we're cleaning up some of the language here in the Mechanical System Acceptance Testing by explicitly including Dedicated Outdoor Air Systems, Heat Recovery Ventilation, and Energy Recovery Ventilation Systems that they're required to test when there's an economizing feature. We're also doing a minor editorial change in the exception to make the language a bit more clear.

Next slide, please.

For Section 120.7, we have renamed the section to Mandatory Requirements for Building Envelopes. The requirements of this section will apply to the entire building envelope, and not just insulation. And the reason for this change is because for 2025, we intend to add Mandatory Requirements for exterior windows and vestibules.

In 120.7(d), we are adding a new Mandatory Requirement for Exterior Windows. So starting in 2026, all vertical administration assemblies and nonresidential and hotel motel buildings shall have an Area-weighted Average U-Factor of no greater than 0.47.

Next slide.

In Section 120.7(e), we are adding a new Mandatory Requirement for Vestibules. This requirement will apply to the public entrances and buildings of Occupancy Types A, B, E, I, and M, and would require nonresidential and hotel/motel buildings to include an enclosed vestibule that is, one, equipped with a self-closing device, and two, if conditioned is provided with controls to shut off the heating or cooling system above or below a certain temperature. This would be greater than 45 degrees for heating and less than 85 degrees for cooling.

Next slide.

There are, however, a number of exceptions to the Mandatory Vestibule Requirement. And so the following scenarios would not require vestibule to be installed. Just running down this list real quick. This would be doors not intended for public use; that open directly from a sleeping dwelling unit; that open directly from a space that is less than 3000 square feet in area; revolving doors; doors used primarily for vehicular movement or

materials; doors equipped with an air curtain; and public entrances in buildings less than four stories, and less than 10,000 square feet in gross condition floor area, in Climate Zones 2 through 13.

Next slide, please

So that ends my portion of the presentation. If we have any questions, please feel free.

Thank you.

MR. BOZORGCHAMI: Thank you, Ronald.

I have a few raised hands. So go ahead, Marina. Please state your name and affiliation and please spell your last name.

MS. BLANCO: Hi. My name is Marina Blanco, B-L-A-N-C-O from Gabel Energy.

And I just wanted to comment specifically about the Mandatory Requirement for Vestibules. Since it's in the mandatory section, making sure how is that being dealt with or triggered when additions and alterations would be very key. Because at this point, it looks like if we're touching the envelope, that could potentially be a trigger. So just making sure that that is clarified.

And I also highly encourage you not to make this mandatory, mostly because vestibules looks of buildings are done by planning, and projects that would be subject to this Mandatory Requirement are going through planning right

now, and would be going for a building permit in a time, and would have to go back to planning, for any envelope or looks and feel changes. Having it be prescriptive, having them be able to test out of it, and performance calculation: great.

But making it a mandatory, and setting projects back so far, and a lot of money for redesign, would be very, very challenging. And assuming that they have the location and square footage or front entrance to a location, in all of our jurisdictions all across the State, does seem to be a challenge. Could be a challenge. And if it's mandatory, there's no way to get out of that unless they had -- they could, yes, they could meet some of these exceptions, but again, planning is the one who decides this. That would be a challenge in most locations, to go back.

Thank you.

MR. BOZORGCHAMI: Thank you, Marina. Duly noted. Thank you.

Marina, if it's possible, could you submit a comment to the docket on that one too, please?

But for now, Gina, would you state your name, affiliation, and spell your last name? I know it's spelled easy, but please.

MS. RODDA: That's okay. I get it. Gina

Griffiths Radda, G-R-I-F-F-I-T-H-S, R-O-D-D-A. I'm also from Gabel Energy.

And just to confirm and affirm that we have docketed this letter already with this comment regarding the vestibule yesterday. I want to add another issue that I have regarding this Mandatory Vestibule Requirement, of which not all buildings have the ability to support the vestibules. And we do a lot of work in downtown areas, and there's no room for a vestibule. And if we're talking about downtown San Francisco and its relatively mild Climate Zone, I just don't see how the cost effectiveness associated with these vestibules can be supported in the cost it would take to carve out space for the building to support a vestibule.

And I would like to also support that this should be considered as a prescriptive measure, and please clean up when it applies to additions and alterations.

Thank you.

MR. BOZORGCHAMI: Thank you, Gina. We'll all go back and we'll look at the language one more time.

Any other comments, questions?

Earlier on I saw a raised hand before Ronald started talking from Thomas. Thomas, would you like to raise your hand if you any questions or concerns?

If not, I'm going to go on to Mikey Shewmaker to

ask if there's any comments in the Q&A.

MR. SHEWMAKER: We have no open questions in the Q&A at this time.

MR. BOZORGCHAMI: You have no open questions. Okay.

So if that's the case, we're going to move on to the lighting provisions with Simon Lee.

Again, here's the link. If you have further comments or discussions, please submit them here by May 13th. I heard already from Gina that there's comments already there. So that's good. Thank you.

So with that, Simon, are you ready?

MR. LEE: Hello. Can you hear me?

MR. SHEWMAKER: Yes. We can, Simon.

MR. LEE: Great. Thanks.

Good morning. This is Simon Lee, one of the engineers in the Commission, and I will go over the changes to the lighting sections and the electrical power distribution section in Title 24, Part 6.

Beforehand, allow me to provide you an overview about the changes in my presentations. The changes can be summarized into two categories. The first category is about clarification changes based on inputs from stakeholders, and it includes changes to keep up with the technologies, lighting practices, and other laws and

regulations. The second category is about changes based on lighting case proposals, including the Daylighting Case Measure and the Tailored Method Measure. In the next few slides, I will dive into the mandatory requirements of the lighting sections. After that will be the prescriptive requirements and sections, and I will finish off with the changes in Joint Appendix J8 and J10. There is a total of 12 slides in my presentation that I'm going over.

Next slide, please.

Section 130.1(a), Manual Controls. The first change we made in this section is to change the title to Manual Controls. It is shorter but still reflects the purpose of this section, 130.1(a). The second change is to revise the phrase Area Enclosed by Ceiling Partitions, to Indoor Space. Other changes in this section are minor edits such as to use the term space throughout the section. Another clarification added is to include what was used to be in exception one to become part of Section 130.1(a)2.

Next, let's look at Section 130.1(b), Multilevel Lighting Controls, as shown on the middle of the slide. We made a number of clean-ups and clarification in this Multilevel Lighting Controls section. We deleted the Multilevel Lighting Controls table and sections one and two while we keep the requirement to provide continuous dimming from 100 percent to 10 percent in the body of Section

130.1(b). We also changed the Area Enclosed by Ceiling Height to Space. About a possible change in the 15-day terms, we are considering to revise it as Indoor Space instead of Space. This is in the first sentence of this Section 130.1(b), and the intent is to keep all the sections consistent with using the same term. And that's all for Section 130.1(a) and (b).

At this time I'd like to point out the bullets on these slides. They are bullets showing the multifamily sections with similar changes as noted on the slides. An example is the last bullet on the bottom of the slide. It shows the corresponding changes for the Multifamily Lighting Controls, Section 160.5(b)4B. I hope this will be useful in looking up the corresponding multifamily sections. And to save time, I will not mention these multifamily sections.

Next slide, please.

Next section is 130.1(c), about Shut-off Controls Requirements. Similar to the changes in previous section, the changes to the shut-off controls are largely results of stakeholders' inputs, and changes are done to clarify so that the requirements can be understood and followed.

The changes for the Occupant Sensing Controls are as follows. The set to no more than a 20-minute time delay is already a Mandatory Requirement specified in Section

110.9 as applicable to Occupant Sensing Controls. We added the same language to Section 130.1(c) to clarify it is required for all occupant sensing controls specified under Section 130.1(c). For office space greater than 250 square feet, it is required to show the Occupant Sensing Control zone information on joint plans. And we made editorial changes with similar wordings reduced to no more than 20 percent of full power to Section 130.1(c).

Other changes that I'd like to mention is we also clarified the means of egress illumination and the emergency lighting. In Section 130.1(c)6, the occupant setting controls for parking spaces, for stairwells, and for corridors are now all moved to Section 130.1(c)6. And lastly, there are editorial changes to remove redundant phrasing in this section.

Next slide, please.

Section 130.1(d), Daylight Responsive Controls. The changes to the daylighting control requirements are based on code change measures of daylighting. And based on the measure proposal, the trigger thresholds are revised. The new trigger is 75 watts or greater for all daylight zones, including skylit daylight zones, primary sidelit daylight zones, and secondary sidelit daylight zones. We added an exception, and it is for the scenario that's number one, where the primary sidelit daylight zone is not

required for daylight responsive controls, and number two, the secondary sidelit daylight zone has less than 85 watts of generating power. And for the scenario, the secondary sidelit daylight zone is not required to have daylight responsive controls.

Linear luminaires have been used in indoor lighting, and they come in various lengths. So we clarify how linear luminaires can be controlled. For linear luminaires longer than 8 feet, they can be controlled in segments of 8 feet or less for meeting the Daylight Responsive Control Requirements. And the control of the linear luminaires depends on where the segment is primarily located.

You may notice the second title is changed to Daylight Responsive Controls. It used to be Automatic Daylight Controls, and this is to align with the International Energy Conservation Code, short for IECC. Using the same term would help Code users to recognize that Section 130.1(d) is similar to what already exists in the IECC code.

And the last item to mention here is about the interactions with other lighting controls. The control interactions language, which was in Section 130.1(f), is moved to the Daylight Responsive Controls section so that the requirements about the Daylight Responsive Controls are

all within the same section.

Next slide, please.

Section 130.1(f), Occupancy Sensing Controls Interactions with Space Conditioning Systems. Sorry about that, this is a mouthful. These are cleanups to Section 130.1(f), and the section title is changed to reflect the contents of the section.

As I mentioned in the last slide, we move the Control Interactions language about Daylight Responsive Controls to the Daylight Responsive Controls section. The other Control Interactions language about Manual Area Controls, Multilevel Lighting Controls, and Shutoff Controls are deleted from this section. The remaining language about occupancy sensing controls interactions with space conditioning systems remain in the section, and so the section title is changed to reflect this content.

Next slide, please.

Coming to Section 130.2 for Outdoor Lighting Controls Requirements, the changes are clarification in nature, and we anticipate Code users will find the revised code language easier to follow and understand.

And the changes are as follows. The no more than 90 percent language is deleted. This could simplify the Lighting Power Reduction language of the Automatic Scheduling Controls and the Motion Sensing Controls

Requirements. The language now reads as follows: capable of partially reducing the outdoor lighting power by 50 to 90 percent.

Another change to the motion sensing control requirement is that there is no longer a mandate for motion sensing controls on the lighting of building facades, ornamental hardscape, and outdoor dining.

And lastly, we consolidate the language and reduce the number of sections, and this change would help the Code user -- would help the Code be easier to read and understand.

Next slide, please.

Section 130.4(a), lighting acceptance requirements. In this section, we added the time switch lighting controls for CH space, which is in Section 120.6(h)5B, to be required for meeting the acceptance requirements. And that's all for this section.

Next slide, please.

Section 130.5. In this section, we make clarification changes to the controlled receptacles requirements in Section 130.5d.

There are four changes to this section, Section D. First, we replaced split wire receptacle with multiple receptacle. This change will align with multiple receptacle as defined in California Electrical Code. In

the Electrical Code it is defined, a multiple receptacle is two or more contact devices on the same strap. For the Controlled Receptacle Marking Requirement, we simplify the language while maintaining the intent of the requirement. The word doable is deleted. It simply provides a permanent marking for controlled receptacles.

Another change that we made is to align the time delay to off to 20 minutes. This change would apply to controlled receptacles installed in hotel and motel guest rooms. And lastly, we modified a note and it becomes a part of the section. This change is to clarify that hardwired power strip and other plug-in device shall not be used for meeting the controlled receptacle requirements.

Next slide, please.

Now we are going to look at the Prescriptive Requirements for Indoor Lighting, Section 140.6. Within Section 140.6, there is a section that allows the installed general lighting power to be adjusted, and one type is portable lighting. We deleted the exception to Section 140.6(a) for portable lighting in office areas, as there is already a provision in Table 140.6(a) for portable lighting in offices.

In this Section 140.6, we also have the PAF requirements. PAF is short for Power Adjustment Factors. And we clarify the requirements, and for Occupants Sensing

Control PAF, we added a requirement for Occupants Sensing Control Zones to be shown on drawing plans. For the Demand Responsive Control PAF, we have added the following clarifying language for the PAF. If DL controls are required based on Section 110.12(c), this PAF is not available for any lighting in the project.

And lastly, we revised the definition of temporary lighting in order to align it with the Temporary Lighting Definition of California Electrical Code, Article 590, for temporary lighting installation up to 90 days.

Next slide, please.

We are now going to look at the changes to the Lighting Power Compliance Methods. The major change is to remove the Tailored Method, and this is based on stakeholders' inputs that we received, and the intent is to simplify the indoor lighting power allowance -- Indoor Lighting Compliance Methods. This change would remove all the Tailored Method tables and all the sections associated with the Tailored Method in Section 140.6.

And I will summarize the changes as follows. We added additional lighting power allowances for a number of lighting applications that are most commonly used for the Tailored Method. These additional lighting power allowances are added as new entries to Table 140.6(c), and they include the Convention, Conference, Multipurpose and

Meeting Area; the Bar/Lounge and Fine Dining Area; the Main Entry, Lobby Area; the Grocery Sales Area; and the Retail Merchandise Sales Area. And you will see on the next slide for the allowance for Convention, Conference, Multipurpose, and Meeting Area.

Next slide, please.

This slide shows the additional lighting power allowance for Convention, Conference, Multipurpose, and Meeting Area. And this is only a partial of Table 140.6(c). And we have already presented the same information in the pre-rulemaking workshop.

Next slide, please.

We are coming to the prescriptive outdoor lighting and the sign lighting section.

Section 140.7, Prescriptive Requirements for Outdoor Lighting. The change is to add notes to the outdoor lighting allowance table to clarify how the additional lighting power could be used. One note is to clarify the Special Security Lighting for Retail Parking and Pedestrian Hardscape lighting allowance. Another note is to clarify the security camera lighting allowance.

And going to Section 140.8, Prescriptive Requirements for Signs. For the Sign Lighting Requirements, the change is to update the sign lighting light source. We removed legacy light sources, including

high-pressure sodium lamps, metal heat island lamps, and fluorescent lamps from this section.

Next slide, please.

We're coming to the last slide. Joint Appendix JA8. JA8 is used along with the Residential Lighting Requirements, and it applies to residential luminaires, including recessed downlights and other LED light source required for meeting JA8.

Two essential updates in JA8. First, we updated the performance criteria and the test requirements for incandescent lamps and fluorescent lamps. The change is to reflect the banning of the sales of general service incandescent lamps after July, 2023 in California. And the banning of the sales of compact fluorescent, also known as CFL, lamps after 2024, and the banning of the sales of pin-based type compact fluorescent and linear fluorescent lamps after 2025.

Second, we deleted reference to the ENERGY STAR program, and we added two subsections about the start time test and the noise test. This change is to reflect the sunset of the ENERGY STAR program for lamps and luminaires effective December 31st, 2024.

And for Joint Appendix JA-10, JA-10 contains the flicker-measurement test for JA8 lighting products. And we made a change with the removal of language related to

fluorescent lamps, and this is to effect the banning of the sales of fluorescent lamps. And the reference test status for fluorescent lamps was deleted from J10.

And this concludes my presentation.

Thank you.

MR. BOZORGCHAMI: Thank you, Simon.

We're going to the comment period right now, and what we're going to ask -- and I just want to give everybody a heads-up, I think we're ahead of schedule a little bit. So we were going to have Bach Tsan present on the amended mechanical provisions after lunch, but I think the decision was to provide enough time for the PV and battery discussions. So with that we're going to move Bach before lunch and do his presentation, and then we'll go from there. And after Bach is done, we'll answer all of the questions and answers and we'll go ahead and take a one-hour lunch break. But before that let's get back to Simon's presentation and the lighting measures.

I see Gina has her hand raised. Gina, please, go ahead.

MS. RODDA: Gina Griffiths Rodda, G-R-I-F-F-I-T-H-S, R-O-D-D-A, from Gabel Energy.

I just want to applaud all the work that was done to clean up the lighting chapters, the beautiful stuff I saw for sign lighting, with the JA8 stuff. I was involved

with all the stuff with nonresidential multifamily indoor lighting, so of course I'm proud of that. But there are a lot of people that were part of these efforts.

And it's really great as compliance improvement here in California to say, we're cleaning things up, we're simplifying, and we are not just continually adding, we're also helping make things make sense.

So thank you.

MR. BOZORGCHAMI: Thank you for those words, Gina. There was a lot of effort and Simon did a really great job in leading that effort here at the Energy Commission.

Thank you.

With that, do we have -- oh, Kelly. Go ahead. I'm going to unmute you. Go ahead. State your name and affiliation, and please spell your last name.

MS. CUNNINGHAM: Kelly Cunningham. C-U-N-N-I-N-G-H-A-M, Pacific Gas and Electric.

And I was not fast enough to raise my hand as Gina was speaking, but my comment was also going to be thank you to the Energy Commission for both moving the lighting sections forward, but also simplifying and clarifying the language within. For the last few cycles, our team had a hope that this would be done, and submitted some suggestions, and really appreciate the participatory

process, and congratulate you on a cleaner lighting section of the Code that properly reflects the phase-out of technologies in California, and responding to past legislation, and also the moving on to more efficient sources.

So thank you very much.

MR. BOZORGCHAMI: Thank you, Kelly. And on behalf of the Energy Commission, I do have to thank your team for helping out with all of the cleanup language that you guys were really participated in. Thank you.

Next, Jon McHugh, go ahead. I'm going to unmute you. State your name and affiliation, and spell your last name, please, for the record.

MR. MCHUGH: Sure. Jon McHugh, M-C-H-U-G-H, representing McHugh Energy.

And I just have one question about the -- as Simon noted, ENERGY STAR is being phased out. I'm wondering what -- is the J8 test standard going to address high-temperature or elevated temperature, you know, for the JA8(e), you know, elevated temperature ratings which are needed for enclosed and recessed light? Is there something that is planned to be added, or -- because I think in the past that referenced the ENERGY STAR program?

MR. LEE: Yeah. Hi, Jon. Thanks for asking the question.

We still have that requirement. I believe that's in JA8.5. So manufacturers and testing labs can still refer to that section. It has reference to this testing as required. And yeah, we -- just want to mention that it's, from my understanding, it's a small portion of the products that will be using those high-temperature test. And so that's one of the reasons that we still have that reference in JA8.5. But this Code cycle, we have not, I guess, extracted the ENERGY STAR tests as new sections in JA8. But, yeah, we certainly can consider it in the next Code cycle.

MR. MCHUGH: Okay. Thank you very much. Yeah, that's -- I just wanted to understand. Yeah.

Thank you.

MR. BOZORGCHAMI: So, Simon, just to make sure we're clear, we still couldn't meet that requirement of temperature, that that language is still JA8.5.

Correct?

MR. LEE: Yes. We still have that same language in JA8. Yeah.

MR. BOZORGCHAMI: Okay. Just wanted to confirm that. Thank you, sir.

MR. LEE: Yeah. Sure. You're welcome.

MR. BOZORGCHAMI: Any more raised hands?

I don't see any more raised hands, so from there

I'm going to transfer to Michael.

Do we have any questions in the Q&A? And I'm going to mute myself because I see there's an echo happening.

MR. SHEWMAKER: Thanks Payam. No, we have no open questions in the Q&A at this time.

MR. BOZORGCHAMI: Okay.

With that, thank you. Thank you, Simon. Thank you, everyone.

Again, if there's more comments, you can submit your comments here by May 13th, and then here's the docket information.

As I said earlier, I think, we're going to take a short one minute break and get Bach in here to get ready. And we're just going to move forward and do his presentation on the nonresidential sections of 140.3, 140.4, and 141. So stay tuned.

We're just going to move forward and then we've got enough time we can do this, and maybe have to take a -- instead of a 12 o'clock lunch break, we may have to take a maybe 12:15 or 12:20 lunch break, but we'll have enough time for this afternoon's discussions on PV and Battery Energy Storage Systems.

So give us one second.

(Pause.)

Alright. So I think Simon's ready and -- I'm so sorry, Bach Tsan. Simon's friend, Bach being our Senior Mechanical Engineer.

Sorry about that, Bach. Apologize.

MR. TSAN: Great. Good morning, everyone. Hopefully everyone can hear me.

Alright, so welcome. I'm Bach Tsan, the Senior Mechanical Engineer for the Building Standards Branch of the California Energy Commission. We will walk through the proposed changes for the 2025 Building Energy Efficiency Standards, focusing on Sections 140.3, 140.4, and 141, relating to nonresidential buildings.

Just a high level, you know -- Section 140.3 are the Prescriptive Requirements for Nonresidential Building Envelopes. 140.4 is the Prescriptive Requirements for Space Conditioning Systems. 140.1 is the section for Additions, Alterations, Repairs to Existing Residential and Hotel and Motel Buildings.

Okay. Let me -- give me one second. I'll change my headset.

MR. BOZORGCHAMI: Sorry, folks. We're always having headset issues here at the Energy Commission.

(Pause.)

MR. TSAN: Testing. There you go. Apologies for that.

Alright. Hopefully I'm coming in better now. I was told I was a bit low. Alright.

Next slide, please.

Alright. So we'll start with Section -- you know, we'll look at the Table 140.3-B, which introduces proposals to lower the prescriptive maximum U-Factor for roofs, ceilings, and walls, encompassing metal buildings and wood frame structures across all Climate Zones. The proposed changes include reducing the maximum U-Factor for roofs and ceilings in the metal building and wood framed and other categories for all Climate Zones. Similarly, the maximum U-Factor for walls in metal buildings, mass-light, and wood framed and other is proposed to be reduced across all Climate Zones.

Additionally, for mass-heavy walls, a reduction in the maximum U-Factor is proposed but limited to Climate Zones 1 and 11 -- sorry, Climate Zones 1 and 11 through 16.

Next slide, please.So in this next section, we'll go through the proposal for these types of building types for the 2025 Heat Pump Baseline.

Next slide, please.

So as -- I wanted to recap, but for the 2022 Nonresidential HVAC requirements, the 2022 Energy Code Section 140.4(a)2 sets specific baselines for incorporating heat pump technology in various nonresidential buildings

with heating and cooling systems that have a rated cooling capacity of up to 240,000 BTUs per hour. Requirements vary based on space type and Climate Zone, but for retail and grocery stores in Climate Zones 2 through 15, a heat pump is required, whereas in Climate Zones 1 and 16, an air conditioner with a furnace is required for cooling capacities under 65,000 BTU per hour, and a dual fuel heat pump for capacity is 65,000 BTUs per hour or above. In schools less than 150,000 square feet and three stories or fewer, a heat pump is necessary for Climate Zones 2 through 15, while dual fuel heat pump is required in Climate Zones 1 and 16. Offices, financial institutions, and libraries across Climate Zones 1 to 15 must install a heat pump. However, in Climate Zone 16, spaces with less than 65,000 BTUs per hour cooling capacity need an air conditioner with a furnace, and those with 65,000 BTUs per hour or more require dual fuel heat pumps. Offices and spaces and warehouses are -- you know, have a heat pump in all Climate Zones.

Next slide, please.

So I wanted to talk about the buildings that we, our -- the buildings we, our, approach used -- the prescriptive building prototypes used in our analysis for the 2025 Proposal. We'll discuss how these baselines are adapted and expanded to the '25 standards, but, you know,

for, we've developed descriptors for the Large Offices, Medium Offices, and Large Schools. These prototypes shown here detail the size of the prototypes using the analysis to develop the perspective baselines, and we'll show -- you know, we'll show more of what the baselines are in later slides. But the Large Office here is 12 stories with the basement, the Medium Office is 50,300 square feet with three stories, and the Large Schools is approximately 210,000 square feet and two stories.

Next slide, please.

Alright. So this is a little bit wordy, but this slide maps out the transition from the current 2022 Energy Code residential -- nonresidential system maps to the proposed 2025 systems for Medium and Large Offices and Schools, focusing on modifications to the systems utilizing heat pump technologies. If this -- if approved, this will be used to update the system mapping in the Alternative Calculation Methods Manual.

So for Medium Offices with a total conditioned floor of less than 25,000 square feet and having four to five floors, the proposed system will have Variable Refrigerant Flow and Dedicated Outside Air Systems. Similarly, for systems ranging 25k to 150,000 square feet of conditioned floor area and up to and equal to five floors, the system will be a VRF and a DOAS system, whereas

it's currently served by Packaged VAVs.

Now for the Large Offices, you know -- defined here in the left-hand column as for buildings with less than or equal to 150,000 square feet and greater than five floors -- the proposed system is an Air-to-Water Heat Pump with Four Pipe Fan Coils. The system is also applied to buildings with floor areas greater than 150,000 square feet across all Climate Zones.

Moving to Large Schools, we follow a similar logic. For buildings with less than or equal to 150,000 square feet or greater than five floors, the proposed system is an Air-to-Water Heat Pump with Four Pipe Fan Coils. The system is also applied to buildings with floor areas greater than 150,000 square feet, and across all Climate Zones.

Next slide, please.

So, you know, these -- moving on to the next, you know. This slide shows the update we're focusing on. So in Section 140.4(a)3, which deals with multizone space conditioning system types. This is in addition to the Building Standards, you know, for the newly constructed buildings.

Here's what's new. So we've introduced the new section titled multizone space conditioning types. This section sets out a prescriptive requirement that are

tailored for Medium Offices, Large Offices, and Large Schools. This means a system designed for the needs of these large spaces.

It's important to note that the single zone phase conditioning systems, which were previously covered in the site above, in Section 140.4(a)2, are complemented by these Multizone System Requirements.

So, just a note here. You know, the CEC staff is considering modifications to the 15-day language. And, you know, an example of such modification is shown here for 140.4(a)3F, where this modification states that any space conditioning system as determined by the Executive Director should not use more energy than what is specified, stated in 140.4(a)3. And this must be in accordance with the provisions in 10-109(h), which allows for considerations of systems that are designed and equivalent or better than the proposed prescriptive paths.

Next slide, please.

So we're going into detail about the specific system requirements for Medium and Large Offices. As stated, we've added a new section to address the requirements for multizone space conditioning systems in office buildings with the characteristics is described in the proposed system map. In Section 140.4(a)3i, the Medium Office with HVAC system features such as Variable

Refrigerant Flow, Dedicated Outdoor Air Systems, and Heat Recovery Systems. We describe the indoor fan requirements in the following slides, a couple of slides down, and it speaks to Section 140.4(a)3D and the following DOAS in Section 140.4(a)3E.

So in Section 140.4(a)3Aii, we cover the Large Office space conditioning system, which consists of a Four Pipe Fan Coil with Dedicated Outside Air System providing the ventilation. The coil shall be supplied with an Air-to-Water Heat Pump, which will be discussed two slides down. We added an alternative in the Section 140.4(a)3Aiii which allows for any type of system utilizing heat supplied through a water loop, but is supplied by an Air-to-Water Heat Pump, and include Demand Control Ventilation, or DCV, for ventilation and a heat recovery system. So this accommodates systems designed with variable air volume terminal units.

Next slide, please.

So, you know, this slide covers the School Buildings. In, you know, Section 140.4(a)3B, we cover the Large School space conditioning system, which, similar to the Large Office, also consists of Four Pipe Fan Coils, Dedicated Outside Air System, providing the ventilation and Heat Recovery Ventilation with bypass which performs the economizer function.

Next slide, please.

So, in Section 140.4(a)3C, this introduces the specific prescriptive requirements aimed at the performance of space heating water loops in an Air-to-Water Heat Pump system. In this proposal, Air-to-Water Heat Pump systems are to have a coefficient of 3.29 or greater -- or a coefficient of performance, or COP, of 3.29 or greater. This requirement is contingent upon the unit operating at 47 dry bulb and 43 wet bulb outdoor temperatures. Additionally, these systems are required to maintain the design supply temperature within the hot water loop to guarantee performance. Furthermore, the use of Air-to-Water Heat Pump to produce chilled water for cooling purposes is permitted only when the system is also fulfilling the heating demands concurrently.

Regarding system capacity, the fluid volume in the hot water loop must equal to or exceed 8 gallons for every nominal ton of heating capacity the system provides. Here the last bullet here states that supplemental heating by an electric-resisting boiler is capped at a maximum of 50 percent of the system's designed heating capacity.

Next slide, please.

So, Section 140.4(a)3D establishes the requirements for the indoor fans used in office and school buildings that utilize multizone space conditioning

systems. The indoor fans should not exceed an energy consumption of 0.35 watts per cubic foot when operating at the designed airflow level. These fans are required to offer a minimum of three operational speeds. Additionally, these indoor fans are to have the capability to automatically shut off when neither heating nor cooling is necessary.

Alright. Next slide.

So this slide, this proposed Section 140.4(a)3E concerns Dedicated Outside Air Systems, or DOAS. Multizone space conditioning are required to be in -- required to have both -- be in compliance with both sections 140.4(p) and 140.4(q). Specifically, DOAS must conform to 140.4(p), and as part of these requirements, they must also incorporate the heat recovery system in line with the Section 140.4(q). Additionally, this sets the maximum fan energy consumption at 0.77 watts per cubic foot.

I'm sorry, per cubic foot per -- watts per cubic -- watts per CFM, cubic foot per minute. Sorry.

So for the systems that incorporate heating coils, this must be of the hydronic type, and must be connected to an Air-to-Water Heat Pump space-heating hot water loop. In the case of the cooling coils, this too must be hydronic, and are to utilize space-cooling chilled water.

There's an exception in 140.4(a)3E. In instances where the building's design does not feature an Air-to-Water Heat Pump with a space-heating hot water loop, or a designated system for space-heating chilled water, the DOAS may utilize heat pump coils for both heating and cooling functions. This exception allows for the design flexibility.

Alright. Next slide, please.

So that concludes our discussions for the Large Office, Large Schools, and Medium Office buildings.

Next up is the proposed update for nonresidential direct controls. This proposed update introduces a requirement for compliance with ASHRAE's Guideline 36, which brings a series of specific control requirements for airside HVAC. So for variable air volume, or VAV, systems, as per Section 140.4(c)2, there must now be a static pressure set point reset control. This allows for dynamic adjustment of static pressure set point based on varying conditions.

In addition, Section 140.4(d)2.A.v stipulates that space conditioning zones must be equipped with direct digital controls, or DDC. For systems that include economizers, Section 140.4(e)2.D mandates the sequences are used based upon ASHRAE Guideline 36.

Lastly, Section 140.4(f)3 focuses on the

requirement for supplier temperature reset controls, enabling the supplier temperature set point to be reset based on actual demand or other specified parameters.

Next slide, please.

So continuing non-res HVAC controls, Section 140.4(r) proposes the requirements that HVAC systems be equipped with direct digital control, and must utilize programming libraries from ASHRAE Guideline 36. This means that controller logic should be derived from a programming library that is based on sequences of operations as outlined in Guideline 36.

There are, however, specific exceptions to this rule. The first exception allows for logic from certified programming libraries to be modified to cater to particular operational needs that are not covered in Guideline 36. The second exception -- exception 2 here -- relates to HVAC systems that are installed in healthcare facilities which are exempt from this requirement. Additionally, a third exception specifies that non-programmable or configurable-only controllers for zone terminal units are to adhere to Guideline 36 zone control sequences, as referenced in JA15 -- sorry, this is an error. This should be JA18, Table 18-1. So I'll --

MR. BOZORGCHAMI: Bach, we'll fix that before we post this on the web. No worries.

MR. TSAN: Yeah.

However, these controllers are not required to comply with the programming library where I detailed in Section 140.4(r)3.

Alright. Next slide, please.

Alright. So as I spoke earlier, we'll make some of that adjustment, but we've added a new Joint Appendix. This is to accommodate nonresidential HVAC controls. JA18, or Joint Appendix 18, delineates the certification submittal requirements for programming libraries of HVAC systems as specified in Section 140.4(r) within the context of Guideline 36. It's for manufacturers and suppliers of building automation systems, or BAS systems, to obtain certifications for their libraries by the CEC, complying with the Parts of Title 24.6. JA18 also lays out the thorough certification process, the criteria that's needed to be met, and the necessary forms for declaration.

Yeah. Alright. So that was it for Guideline 36 in HVAC -- non-res HVAC controls.

We'll move to additional prescriptive requirements for multizone space conditioning systems.

So in Section 140.4(s) for mechanical heat recovery, we're implementing new requirements for mechanical heat recovery for large buildings. These target very large buildings based on the design capacity or the

coincident peak cooling. There are two greater-than equations to determine if mechanical heat recovery is required. A couple of exceptions here for laboratory buildings with heat recovery in buildings under 600,000 kbtuh and in Climate Zone 15.

Next slide, please.

So additionally, in Section 140.4(s)2, heat recovery for service water heating, we're implementing -- if the building requires heat recovery in the previous subsection, then it will also be required to preheat the service hot water if the design capacity for service water heating is greater than 500,000 BTUH. For computer rooms with heat recovery already there, it's an exception if there are over a certain threshold based on the design.

Alright. And that's it for the prescriptive requirements for heat recovery.

Next, we'll go into nonresidential alterations. Next we'll speak with -- this will be the 2025 proposals for non-res alterations.

Next slide, please.

So, a new section has been created. So the Section 140.0(b)2C is a proposed addition to the requirements for space conditioning systems focusing on the use of heat pumps in new or replacement single-zone package rooftop systems that are less than 65,000 BTUs per hour. A

portion of the content previously within this section has been moved to a newly established subsection, labeled 141.0(b)2Ci.

So additionally, this Section 140.0(b)2Cii has been introduced to handle the prescriptive requirements for heat pumps and single-zone rooftop systems that use DX, or Direct Expansion, cooling, and Section 141.0b)2Ciii was added. This new subsection outlines particular circumstances in which inclusion of an economizer is necessary according to prescriptive standards set forth.

Alright. Next slide, please.

So in Section 141.0(b)2Cii, we introduced requirements for the use of heat pumps in new or replacement single-zone Direct Expansion rooftop systems for the cooling capacity under 65,000 BTUs per hour. These target the smaller institutions, like schools, offices, retail spaces, and libraries, setting heat pump technology as a system type for a space conditioning system. Compliance requirements are laid out in Table 141-E-1 or Section 141.0(b)3 is mandatory.

Additionally, air conditioners equipped with variable speed fans are required to modulate airflow relative to the cooling load, including at least two-stage fan control, and should not exceed 30 percent of the full-speed power when operating at half the full speed.

Next slide.

So this table kind of gives you alternatives to Section 141.0(b)2Cii. It gives you a visual of where -- of which systems are required in which Climate Zones, and based on the building area types. So, yeah, when one wants to replace their A/C furnace or rooftop unit with an A/C furnace, depending on the Climate Zone and the building type, they can do so prescriptively when repairing that system with an economizer, and in some cases, either demand control ventilation or a variable frequency drive. As with all prescriptive requirements, one can always demonstrate compliance via a performance approach if they would like to use different types of systems.

Alright. Next slide.

So that concludes this section.

So we're opening up for comments and questions.

MR. BOZORGCHAMI: Thank you. Thank you, Bach.

So I have a few raised hands.

So we're going to go straight to Skip. Go ahead, Skip. State your name and affiliation, and please spell your last name for the record.

MR. ERNST: Hi. Skip Ernst with Daikin. Last name, E-R-N-S-T.

Guideline 36 question. In past web meetings, you know, I think last fall, it was asked and answered that you

were aimed at building controls, and factory-installed unit controls were not part of this.

Is that still true?

MR. BOZORGCHAMI: Let me see if our consultant Rupam is on.

Rupam, could you answer that question, please?

MS. SINGLA: Hi. Yes. This is Rupam Sinha.

Yes. That is still the case.

MR. ERNST: Thank you.

MR. BOZORGCHAMI: Thank you. Thank you, Rupam. Thank you, Skip.

Next, Gina, go ahead.

MS. RADDA: Hello. Gina Griffiths Radda, G-R-I-F-F-I-T-H-S R-A-D-D-A, from Gabel Energy.

I have a bit of an issue with Guideline 36 in terms of enforceability. What does enforcement look like to our building departments when they're trying to support the Guideline 36 requirements? I really am hoping that there's some careful thought about how that's supported in the compliance forms, and in the field verification that might be associated with those particular -- hey, is it certified controls? Who's confirming it's on the certified list? And to support the building departments.

And that was it. Thank you.

MR. BOZORGCHAMI: Thanks, Gina.

We're going to have to take that into consideration and work with our enforcement team, and see what we can do with that, and get back to you on that. So stay tuned, we'll provide a response.

Ted, go ahead and state your name and affiliation. Please spell your last name.

MR. TIFFANY: Yeah. Hi. Ted Tiffany, T-I-F-F-A-N-Y. Speaking on behalf of myself today, but affiliated with the Building Decarbonization Coalition.

I just wanted to thank all of the hard work from staff on developing these nonresidential baselines for schools that include heat pumps. I know there has been some public comment recently about repealing the heat pump baselines for multizone systems. I would encourage you to look at additional prescriptive leeway for the heat pump allowances in multizone systems, but do not repeal the heat pump baselines in its entirety. I understand that the Commission has put a lot of work and thought into the LSC metrics for these, and provided a lot of background information over the last couple of years on the development of these baselines, and I want to encourage you to maintain those in the 45-day language and get this to final language.

So again, just want to appreciate all the hard work from staff, and encourage you to continue on the path

that you've started.

Thank you very much.

MR. BOZORGCHAMI: Thank you, Ted.

Next we have Christopher. I'm going to unmute you. Please state your name and affiliation, and spell your last name for the record.

MR. RUCH: Christopher Ruch with NEMI. That's R-U-C-H.

I was specifically asking about 140.4(a)3B. So this would be the multizone conditioning system types and specifically for school buildings. Could you provide kind of the rationale behind that, or what was the thinking, or, you know, why it was limited to that? Or what's the thought process? Just so we can understand a little bit better.

MR. TSAN: Yes. For school buildings 140.14(a)3B -- yeah, so this is for the extremely large schools.

So our prototype looked at the 210,000 square foot building, and -- as a multizone system -- our analysis found that Air-to-Water Heat Pump with the Four Pipe Fan Coil system is dedicated to air and heat recovery. It was a viable or reasonable system for this type of facility and building.

I understand that, you know, through the -- we state before that, if you could, if you wanted to perform

this through a -- deliver your system air heating and cooling capacities through VAV systems, you could do so with some additional measures attached to that, but you would have to go through the performance approach at this time.

MR. RUCH: So am I hearing you right, that you basically determined that this was the most efficient way to put in these systems for that size of building? Is that a correct statement?

MR. TSAN: Yeah. The most efficient. Yeah. Based on our LSC metrics, Source Energy metrics, yes.

MR. PEREZ: Let me add to that, Bach, if that's okay. This is Javier Perez with the Energy Commission.

Thanks for the question, Christopher.

You know, I think in an ideal world, we'd have multiple solutions that achieve the efficiency that we prescribed here for the systems that we have identified for the buildings that we're talking about, right? But, you know, in the time that we've had and in the analysis that we had, these are the systems that we've identified that are cost-effective and that are technically feasible and that can achieve the targets that we're seeing. You know, I think one thing that Bach presented early on is that we are considering having language that allows for future development of prescriptive pathways, where systems are

equal in energy consumption or better.

You know, I think speaking to Ted's comment earlier, we recognize that there are multiple strategies to achieve energy efficiency and to achieve our general long-term goals, you know, and we're looking to try and -- step one is get one that meets our rulemaking criteria and then, you know, the next step will be to continue to see what we can do to iterate, and hopefully capture other strategies that meet the same criteria. It's just, I think the system that we have is what we can do in the time that we have right now.

So thanks for the question, Chris. I do want to give you a chance to reply if you have any other comments or thoughts on that.

MR. RUCH: No, thank you. I was just trying to understand the reasoning behind it.

MR. PEREZ: Wonderful. Thank you.

MR. BOZORGCHAMI: Thank you.

Next is Skip. I'm going to let you go ahead. State your name and affiliation.

MR. ERNST: Sorry, I thought I lowered my hand.

MR. BOZORGCHAMI: Okay. No worries. Thank you.

Go ahead, Meg. State your name and affiliation, and spell your last name, please.

MS. WALTNER: Great. Can you hear me?

MR. BOZORGCHAMI: Yes. Perfect.

MS. WALTNER: Okay. Meg Waltner, W-A-L-T-N-E-R, with Energy 350, speaking today on behalf of the Natural Resources Defense Council.

Yeah. Just wanted to support a few of the things that you've presented during this section. Starting with the expansion of the nonresidential baselines to larger multizone systems in larger buildings, you know, strongly support your efforts to expand those heat pump baselines to new building types, larger buildings, multizone systems, an incredibly important step forward to meeting the State's emissions reductions goals. And, you know, I think it's important to emphasize that these are prescriptive requirements. There's alternatives through the performance path. And, you know, I support the work that you've noted and Ted's comments that, you know, there might be ways to add additional flexibility into these prescriptive baselines, but as they are, you know, they set the bar at a heat pump level for these expanded building types. And that's a huge priority of ours, and really happy to see them in there, and support staff's work on that.

Also wanted to support the retrofit measure. Really appreciate staff's work on that as well, and support the requirements as they're listed in the table that Bach showed. Again, that one is really important for

encouraging installation of heat pump systems in smaller commercial buildings during retrofits when we have a chance to make those upgrades.

And then finally wanted to support the hot water supply temperature limits as well. Those are important both for achieving energy savings today and for enabling heat systems in the future.

So, thank you for all your hard work.

MR. BOZORGCHAMI: Thank you, Meg, for the nice words.

Meg, would I be able to have you docket those comments, please?

MS. WALTNER: Oh. Yes, I will definitely be docketing --

MR. BOZORGCHAMI: Wonderful, thank you so much.

MS. WALTNER: -- on these and other issues.

MR. BOZORGCHAMI: Thank you. Thank you.

Next I have Jonny. Go ahead and state your name and affiliation.

MR. KOCHER: Hello, Jonny Kocher here. That's J-O-N-N-Y K-O-C-H-E-R, with Rocky Mountain Institute, or RMI.

Yeah. Calling to largely echo what Meg and Ted have already said. I think that the A/C and heat pump requirements for commercial buildings is a great addition. I really appreciate that you all look forward on doing some

of that, including the 45-day language. It's very powerful.

I also appreciate the work that was done on the commercial baseline for multizone -- sorry, heat pump baseline for multizone buildings. And, yeah, have noticed that there have been some concerns in the docket. And also largely agree with Ted and Meg that there should be ways to add more flexibility, maybe in the prescriptive pathway, but also want to echo that there's always the performance option for folks who find the prescriptive pathway to be a little too daunting.

Yeah. Really appreciate all the leadership that CEC is doing here on this work, on the non-commercial -- or on the nonresidential slash commercial side.

Thank you.

MR. BOZORGCHAMI: Thank you, Jonny. Also, Jonny, can I ask you also, just like Meg, if you could docket those comments, please. Thank you so much, sir.

Hassan, I'm going to unmute you, sir. Go ahead and state your name, affiliation. Please spell your last name for the record.

MR. FAWAZ: Hi there. My name is Hassan Fawaz, F-A-W-A-Z, with Green MEB, mechanical and energy.

So my question is mostly about the VRF prescriptive phase, as I know that we're going to have a

refrigerant change soon, and that refrigerant most likely will be more stringent on ASHRAE 15, and will possibly create more shafts, possibly ventilation for said shafts, depending on what we get from the jurisdiction.

My question is, will there be any type of leeway around it for air source, assuming let's say alterations, you can't build shafts, ASHRAE 15 will end up working for a more stricter refrigerant type? Is there any type of questions being asked right now from the Energy Commission about this with vendors, manufacturers, jurisdiction, your updates on that, and what you would see being an alternative possibly for air source?

MR. TSAN: Yes, there's -- well, as mentioned from the other speakers, there's always the performance path, which can be used to design alternative systems for those buildings. And understood that there will be -- by when this code comes into effect on January 1st, 2026, we will have the low GWP requirements and the low GWP requirements set by the California Air Resources Board in this state for all systems.

MR. BOZORGCHAMI: Okay. Thank you, Bach. Thank you, Hassan.

Next we have Anne. Go ahead, Anne. Unmute yourself and state your name, affiliation, and please spell your last name.

MR. PERNICK: Hi. My name is Anne Pernick, and it's A-N-N-E. Last name is P-E-R, N as in Nancy, I-C-K, and I'm with SAFE Cities at Stand.Earth. And we work with local advocates and local government leaders all over the U.S. and Canada.

And I want to applaud the CEC for extending prescriptive heat pump space heating requirements to all school, retail, library, financial institution, and office occupancies. This benefits California students and workers with clean air, cooling, and air filtration. We also applaud the CEC for maintaining the requirement for heat pumps to be prescriptively required for small package unit replacements in most climate zones, and I want to urge you to please maintain these requirements in the final standards.

Thank you.

MR. BOZORGCHAMI: Thank you Anne. And again, like all others, if you can't submit those comments in the docket that would be wonderful. Thank you so much.

MS. PERNICK: Absolutely.

MR. BOZORGCHAMI: Thank you.

Next we have Blake. Go ahead, Blake. State your name and affiliation, and please spell your last name for the record.

MR. HERRSCHAFT: Hi. My name is Blake

Herrschaft, spelled H-E-R-R-S-C-H-A-F-T. I am the Building Electrification Program Manager for Peninsula Clean Energy, a CCA serving San Mateo County and Los Banos. I am also a trained professional engineer who's designed many HVAC systems in commercial buildings, and use the nonresidential code for those buildings. In addition, I live in a Climate Zone 16, which I wanted to comment on as well.

So I'm very supportive of the existing building prescriptive requirements for small rooftop package units to be required to be heat pumps upon replacement. I strongly urge us to keep that requirement. It'll ease the amount of effort local governments need to do to pass local reach codes, and it's the most common sense approach to start decarbonize our building -- decarbonizing our commercial building stock from an engineering perspective.

I also support reducing the temperature requirements for central systems. We need our -- many of our central condensing unit, condensing boilers, are being modeled as though they're running at condensing temperatures, but are running at 180 degrees, and not necessarily meeting the efficiency as we're seeing in the modeling. Running at lower temperatures will enable a heat pump in the future, and will make sure they're running more efficiently now.

In addition, I would support requiring daytime

occupancy facilities in Climate Zone 16 when they're being replaced to be heat pumps. Climate Zone 16 would also like to get in on this game. We have many daytime occupancy facilities that are already run on heat pumps, and cannot afford to continue to be installing gas equipment for the next three years until the next code cycle.

Thank you so much.

MR. BOZORGCHAMI: Thank you, Blake. Blake, like everyone else, would you be able to submit that comment into the docket?

MR. HERRSCHAFT: Yes.

MR. BOZORGCHAMI: Thank you. Thank you, sir.

Next, we have Jeff. Jeff, I'm going to unmute you. Go ahead and state your name and affiliation, and please spell your last name for the record.

Jeff, if you're speaking, you need to unmute yourself from your side, sir.

MR. WHITELAW: Hi. Can you hear me now?

MR. BOZORGCHAMI: Perfect. Thank you.

MR. WHITELAW: Awesome. Thank you. I have technical issues as well, I guess.

My name is Jeff Whitelaw, W-H-I-T-E-L-A-W. I'm with Daikin Comfort Technologies. I'm noting that we will be putting some comments in writing, either ourselves or through our Industry Trade Association. Our concern is

relative to Section 140.4(a)3B, specifically for the schools. We think that is overly prescriptive, and from my understanding, a Four Pipe Fan Coil system, which is currently in that prescriptive section, is an uncommon system for schools and offices, so we will be commenting further on that.

As to a comment that I heard about VRF systems and A2L refrigerants, I would note that the products' safety codes and building codes are all being updated to ensure that the installation and use of VRF products in all types of buildings will be safe and efficient.

Thank you.

MR. BOZORGCHAMI: Thank you, Jeff. And I look forward to the comments on the Four Pipe Fan Coils. Thank you. And yes, please submit your comments into the docket. And we'll go from there.

I don't have any more raised hands from my side, so with that we're going to transition over to Michael.

Michael, do we have any questions and answers?

MR. SHEWMAKER: Yeah, we have one open question in the Q&A from Nancy Grimm. And her question is, where can we find the system descriptions? And Bach, I believe this came up as you were talking about the HVAC control requirements.

MR. TSAN: Yeah, well so the system descriptions

are found in the nonresidential Alternative Calculations Method. There's tables in that document that highlight what the descriptions are. What I've shown in my presentation is being proposed for 2025, and, if approved, will be transitioned to the 2025 Alternative Calculation Method document.

Hopefully that answers your question.

MR. SHEWMAKER: Thanks, Bach. Yeah, we'll also type our answer into the chat as well. I think Javier's got a response already.

MR. BOZORGCHAMI: Thank you, Mikey. Any more questions or comments in the Q&A?

MR. SHEWMAKER: That's it for online questions.

MR. BOZORGCHAMI: Okay. Thank you.

And I don't see any more raised hands.

So I brought this slide up right here. So there's still an opportunity, like I've been encouraging people to submit -- even if you're presenting and you're commenting now -- please submit your comments into our docket. This is a great way for us to keep records going and -- but please, provide your contact information. Do not submit something anonymous, we can't help when you do. When somebody does that, we can't go any further than that.

So, Commissioner, if it's okay with you and others, I'd like to see if we can take a lunch break and

come back about 12:45, if that's okay, and continue with the discussions on the nonresidential photovoltaics and Battery Energy Storage Systems.

COMMISSIONER MCALLISTER: Sounds great. Thanks, Payam.

MR. BOZORGCHAMI: Alright. Thank you, folks, and we will see you back here at 12:45. Thank you.

(Hearing went to lunch break at 11:38 a.m., returning at 12:45 p.m.)

Alrighty. Good afternoon, everyone. This is Payam Bozorgchami again with the Building Standards Branch at the Energy Commission.

We're going to continue with our hearings again this morning. I know we had scheduled to have nonresidential buildings envelope and HVAC as a tentative schedule to have it done after lunch, but because we were so far ahead in the morning, we decided to do that before lunch and do the presentation.

And for the folks that are coming on right now, these presentations, these hearings, are being recorded and the recordings will be available on our drive here shortly. And you will be able to also -- we will also docket the presentation with the hearings, and so you would have access to the full package. We will also, as as some of you guys have seen already, we do have -- I'll show it to

you right now -- we do have -- you still have time. you have 'til May 13th to provide any comments, and you have -- and within the slides there's contact information for staff, if you need to get a hold of us to ask questions prior to submitting your comments. And the docket here is provided, the address to the docket, and you're more than welcome to provide any comments, questions there, and we will try to answer and resolve a lot of those concerns.

With that said, I'm going to do something out of the ordinary. I'm going to ask if there's any comments, any questions now for what you've heard so far today. If so, please raise your hand and I will unmute you. If not, we will move on and have Muhammad Saeed, our Senior Electrical Engineer, present on the nonresidential battery and PV provisions.

So I don't see any, so I think we're good to move forward.

Muhammad, if you'd like, the microphone is yours.

MR. SAEED: Alright. Good afternoon, everyone. I hope you are doing great. This is Muhammad Saeed. I'm the Senior Electrical Engineer at the Buildings Standards Branch. I'm going to talk about the proposed changes to the Section 140.10, which is about the nonresidential PV and battery storage systems, and some associated changes to JA12.

Next slide, please.

We will first look at the modified nonresidential PV requirements in Section 140.10(a).

Next slide, please.

So this is what we are proposing for 2025 Energy Code for nonresidential PV requirements. The equation will remain the same as in 2022. The Capacity Factor A will be updated based on Climate Zone and LSC. We are proposing to continue to require that the performance standard design system sizing matches the prescriptive requirement.

And finally, for the buildings with solar excess roof area limitations, we are proposing minimum PV capacity requirements that vary depending on the pitch of the roof. For roofs with a pitch of 2 to 12 or less, the minimum PV system size is proposed to be determined by multiplying the solar excess roof area by 14 watts per square feet. For roofs with a pitch greater than 2 to 12, the multiplier is proposed to be 18 watts per square feet.

Next slide, please.

Here is the updated list of the building types proposed to require PV plus battery in the 2025 Energy Code.

There are three new building types which we are proposing to define as follows. Religious worship building: it is a building in which 80 percent of the

building floor area is comprised of religious worship area. Events and exhibits building: it's a museum building, motion picture, or performance arts theater building or other building in which 80 percent of the building floor area is comprised of auditorium area, convention, conference, multipurpose and meeting area, or civic meeting place area. And also sports and recreation building: it's a building in which 80 percent of the building floor area is comprised of exercise or fitness center and gymnasium area, or other area where recreational sports are practiced.

Next slide, please.

The building types shown in bold in the table have new proposed PV requirements for the 2025 Energy Code, as mentioned in the previous slides. The building types with a box around them have modified PV requirements compared to 2022. PV requirements for all other building types have not changed, compared to the 2022 Energy Code.

Next slide, please.

Okay. In this slide, I'm going to explain how the cost-effectiveness strategy was used for PV plus battery for nonresidential buildings. This is also explained in the Section 4.1 of the staff report for the nonresidential PV plus battery, docketed on March 28th, by the title of 2025 Energy Code Measure Proposal,

Photovoltaic and Battery Update and Expansion.

Two sets of PV and battery sizing analyses were performed: a 20/10 export set, and a 2022 Energy Code set. For the 20/10 export analysis, we analyzed the electric load for each prototype. Staff sized the PV system such that only 20 percent of the annual generated electricity was exported. Batteries were then sized using the same program to further reduce exports to 10 percent. For the 2022 Energy Code analysis, PV and battery storage systems were sized according to the 2022 Energy Code. Selecting the final PV and battery sizes for the proposed 2025 code language followed a process that evaluated and compared the 2010 export result and the 2022 Energy Code result. Specifically, this process was, if under the 20/10 process case, a PV with battery storage combination was found to be cost effective for a given prototype, then those results were selected for that prototype. If that 20/10 export PV with battery storage combination was not cost-effective, then either the 20/10 exports PV-only results or the 2022 Energy Code results were selected for the prototype, whichever had lower exports to the grid and was cost-effective.

Next slide, please.

Okay. We are also proposing an important change for nonresidential multi-tenant buildings. As background,

in 2022, we established PV plus battery requirements for the first time, and anticipated that virtual net energy metering would be available for multi-tenant buildings. We recognized that some load-serving entities don't offer VNEM or CEC-approved community solar. As a result, we introduced an exception that PV could not be required if the load-serving entity doesn't offer VNEM or community solar.

Recently the CPUC adopted the Virtual Net Billing Tariff, VNBT, and discontinued the previous VNEM. VNBT does not allow energy bill benefits from netting of energy generation and consumption for multi-tenant and nonresidential buildings. However, individual methods and tenant spaces in these buildings can be excellent candidates for the CPUC's net billing tariff that does allow this netting. Staff evaluated the cost-effectiveness of PV systems for portions of these buildings under NBT, and found that they would be cost-effective down to very small spaces. Staff developed a new proposed exception for the 2025 Standards based on that determination.

So this is how this new exception will work. If there is a multi-tenant building, the conditioned floor area of the building that is used for calculating the PV size will not include tenant spaces that will satisfy all of the three requirements. First requirement is that the

tenant space is less than or equal to 2000 square feet of condition space; number two, that tenant space is served by an individual HVAC system that does not serve other spaces in the building; and, that tenant space has an individual utility meter to track electric consumption, that does not include the electricity consumption of other spaces in the building.

To help you understand, there's a building diagram on the right. Let's consider a nonresidential tenant building with several tenant spaces each measuring 2000 square feet depicted in green, pink, and purple. Among these, the green tenant spaces are served by central HVAC system, while the pink and purple tenant spaces are served by each HVAC system, solely for that unique tenant space. The diagram also indicates the meter that serves the tenant space -- or the central HVAC system, for the tenant spaces served by the central HVAC system. Hence, the conditioned floor areas of the pink and purple tenant spaces will qualify for the exception, while the green tenant space will not. The conditioned floor area for the building that will meet the PV system requirement for the entire building will not include the conditioned floor areas for the pink and purple tenant spaces.

Next slide, please.

Exception 5, discussed on the previous slide, is

not available in two conditions. If either of these conditions exist, Exception 5 to Section 140.10(a) is not applicable.

First, if the CEC has approved a community solar program that applies to the nonresidential multi-tenant buildings, the exception does not apply. In this case, the whole building would comply through the community solar program.

Second, if the load serving entity offers Virtual Net Bill Credits for occupants of nonresidential multi-tenant building to receive energy bill benefits for netting of the energy generation of the PV system and the occupant energy consumption, the exception doesn't apply. In this case, the whole building could comply through the Virtual Energy Bill Credit program.

Next slide, please.

Now let's talk about the rationale related to the 2,000 square feet threshold for this new Exception 5. Staff reached out to CALSA to seek information from PV installers about their experience with installation of PV for nonresidential tenant spaces without Virtual Net Energy Metering. We learned that the PV system cost will usually increase, ranging from 20 to 44 percent. Without VNEM, separate inverters, individual PV disconnects, and production meters may be required. Staff also conducted a

cost-effectiveness analysis under net billing tariff for tenant spaces if the price is increased by 30 percent, as seen from graph above. Even with the 30 percent cost premium, PV installations for tenant spaces were cost-effective for very small tenant space square footage. For example, in Climate Zone 1, an office with conditioned floor area more than 600 square feet will be cost effective with 30 percent cost premium.

Next slide, please.

Now let's look at the nonresidential battery storage requirements. It's Section 140.10(b). Okay.

I think you moved one slide more. Okay. So here are the proposed equations for Battery Energy Storage System capacity in kilowatt-hours, which is directly proportional to the conditioned floor area rather than the direct current kilowatt of PV. Under the first bullet, the equation determines the required minimum rated usable energy capacity. If SARA -- which is Solar Accessible Roof Area -- is limited, an adjustment factor needs to be applied, as shown in the second equation under the first bullet. That adjustment factor is shown in the box. The denominator of the adjustment equation is the kilowatt PV, calculated from equation 140.10(a), that is based on the conditioned floor area, while the numerator is the kilowatt PV, calculated from theta times 14 or 18, depending on the

roof slope.

As far as the power capacity is concerned, under the second bullet, the equation expects the use of 4-hour battery storage to determine the Minimum Rated Power Capacity. As a result, the required power capacity in kWh is simply divided by 4. Just like in 2022, for mixed occupancy buildings, the total battery system capacity for building is determined by applying the Minimum Rated Usable Energy Capacity to each of the listed building types, and summing the capacities determined for each. The performance approach, similar to 2022, will be based on the equations above.

Next slide, please.

The building types in bold are the new ones. the building types that have a box around them are the ones whose battery kilowatt-hour requirements have changed, compared to 2022 Energy Code. Battery kilowatt-hour requirements for all other building types not changed, compared to 2022 Energy Code. So even though the Factor B is watt hour per square feet, rather than the watt hour per DC wattage of PV, for unboxed buildings the battery kilowatt-hour requirements don't change.

Next slide, please.

Okay. Now let's look at the nonresidential JA12 requirements.

Next slide, please.

Staff proposes new definitions for the 2025 Standards, which are Battery Energy Storage Systems, which is a stationary equipment that receives electrical energy, and then utilizes batteries to store that energy for later use to supply electrical energy when needed. The BESS consists of one or more modules, a power conditioning system, and a balance of plant components.

Next is a Field-Assembled Battery Energy Storage System, which is a Battery Energy Storage System with a combination of energy storage modules and inverter components that are installed to operate as a system in the field, and the combination has more than one model number. Integrated BESS is a Battery Energy Storage System that contains both energy storage and inverter components and has a single model number. Usable Capacity is the energy storage capacity in kilowatt-hours that a manufacturer allows to use for charging and discharging.

Next slide, please.

As far as the safety requirements are concerned, we added an option of UL1741 SB, in addition to UL1741 SA for certifications for inverters used in BESS. UL1741 Supplement SB is the product testing standard used by testing agencies to evaluate products in order to certify their compliance with IEEE 1547-2018 and 1547.1-2020. We

have removed the minimum kilowatt-hour requirements for the prescriptive compliance, also clarified that the smaller batteries can be used as long as the sum of the kilowatt-hours add up to 5 kilowatt-hours per building. In the general control requirements, we have removed the subsection C and D regarding the requirements for twice-a-year reset and backup behavior.

Next slide, please.

For nonresidential systems, another control strategy is proposed to be introduced, called the Price Optimization Control. This strategy will be in addition to the other control strategies, which are basic, Time of Use, advanced DR. The Price Optimization Control is added to represent some nonresidential buildings that have battery systems controlled by third-party energy management systems. These batteries are controlled to optimize the use of battery for multiple purposes, such as reducing demand charges or other reasons. This control reserves some portion of the battery storage for other purposes. This is quite different than basic Time of Use or Advanced Demand-Response controls.

It should be noted that the algorithm for this control strategy that will be used in the CBECC software has not yet been developed. We intend to work with battery manufacturers serving the nonresidential market to help us

develop the algorithm for this control strategy.

We have removed the interconnection and NEM requirements section, which was JA12.6. Also we have created requirements for certifications for JA12 listing. For nonresidential battery storage listings, we need the specification sheet showing usable capacity roundtrip efficiency and other characteristics addressed in JA12.3.2.

Next slide, please.

MR. BOZORGCHAMI: Thank you, Mohammad, for your presentation.

I'm going to open it up for any public comments. I'm looking at any raised hand.

We've got Bob Raymer. Go ahead, sir. Sorry. Bob Raymer, go ahead. State your name and affiliation. Please spell your last name, sir.

MR. RAYMER: Thank you Payam and Mohammad. This is Bob Raymer. That's R-A-Y-M-E-R. I'm representing the California Building Industry Association, the California Business Properties Association, the Apartment Association, and Building Owners and Managers Association for California.

And, you know, we certainly understand the reworking, or the need to rework, the exception number five. You know, not to go through the regulatory history, but we weren't at all happy with the PUC decision. We were

able to get multifamily back in there for virtual net metering, but that just wasn't the case for multi-tenant commercial. Not that I still understand why that happened, but it happened.

A request to the CEC -- and this gets out of the Standards -- but for the Energy Conservation Manual, the ECM and the blueprint, it would be great to see three or four examples, including the one that Muhammad just gave, of when this would apply and when it wouldn't apply. it's kind of a difficult read in the Standards, as a great many things in the Standards are. But if you could provide some pictorial explanations of when and where you would be required to meet PV and battery and where you wouldn't, thanks to the PE decision on VNEM, that would be very helpful. I definitely see where the building officials could use something like that, and as well as the building industry.

So once again, we understand the difficult position that you've been put in. We're hoping to change the PUC ruling down the road. There's a number of bills that are in the legislature seeking to do this. But that always takes time. But for the intermediate time, if you could just provide industry with some examples in both the ECM and in the blueprint down the road, that'd be great.

And that's my comment. Thank you.

MR. BOZORGCHAMI: Thank you, Bob.

As you know, after the adoption of the Standards and the approval of the -- after the adoption of the Standards, we have the Energy Commission staff with our consultants work regularly to update the compliance manuals, and we provide fact sheets and information for -- sorry -- for the public to make it easy for them to understand what the Code says. So that's something that we do every Code cycle, and in doing so, I think we are more than happy to cater to that request. To provide examples, to provide guidance of how to meet these compliances.

MR. RAYMER: Thanks a lot. That's perfect. Thank you.

MR. BOZORGCHAMI: That's a -- we will be doing that for not just PV and battery, but for all parts of the standards.

MR. RAYMER: Thank you, Payam.

MR. BOZORGCHAMI: Mm-hm.

Next we have Bronte. Bronte, please, after I unmute you, state your name and affiliation, and please spell your last name. Sorry. For the record.

MS. PAYNE: Hi. Bronte Payne with SunPower. Last name is Payne, P-A-Y-N-E.

I just had a clarifying question. I think I know the answer to this, but for the PV exceptions, it only

applies to the truly nonresidential buildings. So even though high-rise multifamily is under this portion of the code, the exceptions don't apply because those did retain?

MR. SAEED: Correct. you are correct.

MS. PAYNE: That is correct?

MR. SAEED: Yeah. Yeah, correct Payan.

And even if you have, you know, mixed-use building, this exception is only for the Section 140.10. Nothing -- we will discuss tomorrow about what's going to happen with Section 170.2. Yeah.

MS. PAYNE: Thank you.

MR. BOZORGCHAMI: So, Bronte, I guess you're going to have to be here tomorrow, and we will have more further discussions on that part.

MS. PAYNE: I will definitely be there tomorrow.

MR. BOZORGCHAMI: Wonderful. Looking forward to it.

I don't see any more raised hands. So with that, I'm going to revert back to Michael.

Do we have any comments in the queue?

Oh. Sorry. I said it too early.

Marina, I'm going to unmute you. Go ahead and state your name, affiliation, and please spell your last name for the record.

MS. BLANCO: Hi, my name is Marina Blanco, B-L-A-

N-C-O, with Gabel Energy.

And thank you guys so much for the presentation. It was a great presentation, helping to clarify some questions.

I just wanted to make sure, since we're adding new building types to the PV and battery tables, I want to make sure that we're really clear as to what the definitions of those are, and providing definitions, because they don't match up with building-level Building Code occupancies, and there can be a lot of confusion about this is Occupancy A but it has potentially different building types within the Energy Code.

So please, if we're not going to reference building occupancies, as is seen through the rest of Title 24, we do need definitions of what these ones include or do not include. It would be very, very heavy.

MR. BOZORGCHAMI: Sure. Sure. So I think we could do that through our blueprints, and I think we could do that through the manual and provide further description and evaluation of those building types.

MS. BLANCO: That would be great.

MR. BOZORGCHAMI: Yeah.

MS. BLANCO: Yeah. And how that would be -- and how, for the enforcement agents, to make that clear as to where that they might find that information, because that's

not something that's typically shown --

MR. BOZORGCHAMI: Understood.

MR. BLANCO: -- in the drawing set whereas they're required to put the Occupancy Types --

MR. BOZORGCHAMI: Understood.

MS. BLANCO: -- for the other occupancies on there. Yeah.

MR. BOZORGCHAMI: Yeah. Understood.

MS. BLANCO: Great.

MR. BOZORGCHAMI: We'll work with you and Gina, and the documentation team that develops the forms and documents, and try and make it easier for -- attempt to make it easier for the AHJs out there to do their job properly.

MS. BLANCO: Great. Thank you very much.

MR. BOZORGCHAMI: You're welcome.

MR. PEREZ: And really quickly, Payam, thanks Marina for the comment. Very much appreciate, you know, the clarity that you're asking for.

You know, I think one thing that we do want to make sure you do is submit your comments in writing. Payam hits that every time. You know, I think it'd be useful to see what definitions, or what language for definitions, you might -- or your group might -- think might be most appropriate for some of these buildings that may not have a

clear enough definition, or where those gaps exist. You know, I think that we're definitely conscious that our definitions need to be clear in order for enforcement to be able to draw these lines. So just do want to say, thanks for that comment, and we're very much considering making sure that our definitions aligning with industry practice.

Thank you.

MR. BOZORGCHAMI: Stay tuned, Marina. We're going to be reaching out to you for help.

So with that, I don't see any more raised hand.

Mikey, I'm going to refer back to you. Is there any more comments or Q&A in the Q&A?

MR. SHEWMAKER: Thanks, Payam.

No. We have no open questions at this time.

MR. BOZORGCHAMI: We don't.

So again, I'm going to go to the next slide. Like all other slides, I told everybody, you guys are going to get sick of this slide. Please submit your comments. Submit your questions, comments, concerns to the docket below by before May 13th, if possible. The sooner the better, so that we can get our team and our consultants going to try to resolve some of the issues and try to really get a clean, fine-tuned set of standards out there for the 2025. You can also comment now, and also we can all -- I'm going to open it up right now to any comments or

any topics that you've heard today from all the presenters. And it's just not -- just not Muhammad.

I don't have any raised hand. I have Cheng from our panelist team who has his hand raised change.

Cheng, would you like to say something?

MR. MOUA: Yeah. Just a quick one --

MR. BOZORGCHAMI: Sure.

MR. MOUA: -- Payam. This is Cheng Moua, California Energy Commission.

It was recommended that I answer one of the questions that was asked earlier during the Covered Process section presented by Haile. I believe the question was that, for the Covered Process Acceptance Tests that were mentioned, do they require a certified mechanical acceptance technician to perform the test? Or who would be performing these tests? And the answer to that is no. So the Covered Process Acceptance Tests, those requirements do not fall under the scope of the mechanical ATTCP program.

So just wanted to answer that so we have it on record.

MR. BOZORGCHAMI: Thank you Cheng.

And I think that comment -- that question came from Christopher Ruch.

MR. MOUA: Yeah.

MR. BOZORGCHAMI: And Christopher is on the call

now, so I'm hoping, Christopher, if you have any further questions or comments on that topic, I apologize.

If not, we did get one comment come in from Jeremy. Jeremy, I'm going to unmute you. Go ahead and state your name, your last name, and spell your last name, please.

MR. ZEEDYK: Hello, my name is Jeremy Zeedyk, Z-E-E-D-Y-K.

I just wanted to -- I believe the question that Chris Ruch would have asked if he was listening, or was available right now, would be to the comment that was just made about those acceptance tests not being done by a certified ATT. The question that I would have, then, is if all the acceptance forms are now required to be done on a certified ATTCP database, how would an individual perform that test and record that data without having access to that, if they were not a certified ATT?

It seems to me like a bit of a miss that needs to be captured under the ATT program, the certified program.

MR. MOUA: As far as documenting for the Covered Process Acceptance Test, those are a different set of forms. So those would be the NRCA PRC forms, which do not get registered through the providers. So these tests would be -- as all acceptance tests that are not done through lighting and the mechanical programs -- usually be

performed by the installer. We refer to it as the field technician, but it could be the installer usually. It could be a test and balance contractor, or a commissioning agent, someone with that background and that's involved in the project.

MR. ZEEDYK: Okay. I appreciate that and understand.

I just don't quite understand why that would be a separate function from what a mechanical acceptance testing would be doing, if they are in fact testing mechanical systems for acceptance. It just doesn't quite ring true to me. And I guess we'll just have that further discussion on that.

I appreciate it though. Thank you.

MR. MOUA: Thanks, Jeremy.

MR. BOZORGCHAMI: Thank you, Jeremy. Thank you, Cheng.

Marina, you had raised your hand. I'm going to unmute you. Go ahead and state your name and your affiliation for the record.

MS. BLANCO: Hi, this is Marina Blanco, B-L-A-N-C-O with Gabel Energy. Once again, I totally spaced on one of the comments.

I did want to bring up when it comes to the PV section, I can't remember the code section off the top of

my head right now, but it is in the SARA calculation, defining how to determine SARA. And there is -- I think it's the third point where it says that SARA excludes any areas affiliated with any other local codes, or by -- or, excuse me, by any state codes or local code as approved by essentially the CEC.

The way it's written right now looks like the local codes and the state codes need to be approved. I would just put a slight -- I'm recommending a slight, or asking for a slight change, where they look at bullet points or commas or numbers because it looks like, as it's written, those two both need to be approved at the state level.

MR. SAEED: Yeah, thank you, Marina.

I think, yeah, we have already got that comment docketed and, yeah, we will definitely try to work on it and then get back to you.

Thank you.

MS. BLANCO: Thank you.

MR. BOZORGCHAMI: Thank you, Marina.

Next we have Bronte. Bronte, go ahead and state your name and affiliation.

MS. PAYNE: Bronte Payne, SunPower, P-A-Y-N-E.

I made this comment yesterday, but just to flag it in this PV section, some of the calculations around

cost-effectiveness I think will need to be updated to account for improved cost effectiveness when the ITC is being properly captured.

MR. BOZORGCHAMI: Thank you for that comment, Bronte. Yeah, we still have that record from yesterday, so we'll be evaluating that. We'll look into that.

MS. PAYNE: Yeah, and I'll submit it as a --

MR. BOZORGCHAMI: Wonderful.

MS. PAYNE: -- written comment as well.

MR. BOZORGCHAMI: Absolutely. Thank you.

Mikey, do you have any comments in the Q&A for anything from today's presentation?

MR. SHEWMAKER: No, we have no open questions in the Q&A at this time.

MR. BOZORGCHAMI: Thank you. I don't see any more raised hands.

So Commissioner McAllister, this pretty much ends our presentations for today, and we're ready to move forward. I just wanted to also share with everybody, this next screen. I think it would be important for everybody to see regarding our document -- docking comments to our docket. And if you're having complications, or you're having a little bit of a confusion with what the Energy Commission does, or how we do our process and other sections of Title 24 -- or not per se Title 24, but other

parts of the industry that the California Energy Commission is responsible for -- you can always reach out to Mona Badie, our Public Advisor. And the contact information for her is there, and also her email, and -- excuse me, I said email, but the website to the Public Advisor's Office is also available.

But from here, Commissioner McAllister, Do you have anything to add?

Sir, you're muted.

(Pause.)

MR. SHEWMAKER: Give us just one second, Payam.

MR. BOZORGCHAMI: Sure.

MR. SHEWMAKER: We're having a few technical difficulties.

MR. BOZORGCHAMI: Sure.

COMMISSIONER MCALLISTER: Okay. Is that working now?

MR. BOZORGCHAMI: Wonderful. Beautiful. Thank you.

COMMISSIONER MCALLISTER: Cool. Bluetooth issues. I don't have anything earth-shattering to say.

MR. BOZORGCHAMI: Great.

COMMISSIONER MCALLISTER: But I want to just thank you, and Staff, and all the commenters and all the folks attending today. And, you know, a lot of issues, a

lot of media issues. Definitely want to support the idea that Bob Raymer brought up just a bit ago to, you know, make sure that that we develop -- I know Staff is planning to do this, and it's part of the part of the program going forward, but those equations you know aren't necessarily intuitive, and so a few examples to help folks get grounded with that would be helpful. And so just in terms of usability, and bringing folks along with that approach, I think it makes a lot of sense. And once folks get it intuitively, it'll be relatively straightforward on the PV requirement. But all the issues today, really well done, well-presented.

And just want to encourage people to submit written comments. You know, the more the better. Any idea is a good idea. And so just want to make sure that we're being responsive, and coming out of this process with Code language that is workable, that's effective, that's clear.

So really looking forward to tomorrow, where we'll go on to the residential, and a lot of important issues to discuss there as well, so -- and then that'll wrap up our three days of hearings, and then we'll really be paying attention to the comments that come in, and working with stakeholders to resolve those issues as they come up.

So, thanks again, Payam, Javier, Mikey, all the

presentations today. Really -- Haile and Ron, Simon, Mohammad -- really well done.

And thanks for everyone who's been attending. There's still over 100 people on, so really appreciate your attention.

And, you know, we're a big team trying to get California moving forward in building decarbonization and building the best buildings we can. So, really appreciate everyone's effort and dedication.

So that'll do it. Thanks

MR. BOZORGCHAMI: Thank you, Commissioner. Thank you, Commissioner. I'm going to -- Commissioner, if you allow me, I'm going to open up the dialogue on anything and everything that has to do with Part 6 of the Energy Code, that anybody on the phone would like to express. It doesn't just have to be on what you heard today, but any -- could be on what you heard yesterday or any other areas that we may benefit from hearing from you.

No? Okay.

If not -- oh, we've got one hand up. I'm going to unmute you. Go ahead and state your name and affiliation, please, and spell your last name for the reporter.

MR. CHENG: Hi, this is Hwakong Cheng, C-H-E-N-G. I'm with Taylor Engineers.

Sorry, I joined at one, thinking that I would be hearing the non-res HVAC section, but it looks like you're ahead in the schedule. So I missed that earlier. I apologize for that.

But I did want to comment on the proposed heat pump baselines and express, I think, deep concern with the proposal as it's stated. You know, this is a pretty significant change to the prescriptive HVAC requirements for these building types. It feels like it's being rushed through without sufficient vetting. Right? So that was presented over the summer workshops. And in the express terms, the supporting report was only just recently released with the 45-day language, so, you know, there's limited opportunity for the public and the industry to really review and, I think, have the opportunity to engage and do a back and forth. Right? We're pretty late in the process at this point with 45-day language. You know, we have concerns about some of the assumptions that go into the analysis that we'll comment on in writing.

But, you know, overall, I think that the big concern is we're mandating very limited system options for offices and schools. you know, a Four Pipe Fan Coil, plus DOAS, plus Air-to-Water Heat Pump, that's not a common system that designers are choosing to use today, and so it's not clear that that's really always universally going

to be the right system type for different applications. You know, whether it is truly cost effective compared to the baseline, I think, is very questionable. It sounds like a very expensive system, and my fear is that this is going to push projects that would otherwise go prescriptive to the performance approach, you know, which -- you know, there's lots of modeling issues, it's very difficult -- excuse me -- difficult to enforce, right? If the goal is to promote the use of heat pumps, I think there are other ways to do this. I hope we can find those for this cycle or for the next cycle.

MR. BOZORGCHAMI: Okay. So I think, Mr. Cheng, you're talking about the Large Schools and the Large Office spaces. The provisions in the code right now are 140.4, I believe it is.

I think if -- Bach, are you online? Can you write some information on that?

MR. TSAN: Yes. Hi. This is Bach. Yeah, we have been reviewing some of the comments that are coming in.

You know, the comments in the reports have been published and docketed with the rest of the rulemaking package. So we welcome and encourage comments that will come in, and we would like to discuss with you further.

So for the most part, we presented this a little

bit earlier, about where this applies, and how this is a prescriptive option that was evaluated, that was economically feasible in our -- and technologically available in our analysis. So we would like to see a little bit more detail on where those have been addressed.

So yeah, sure.

MR. BOZORGCHAMI: I think, Javier, you may want to also add on to this a little bit.

MR. PEREZ: Yeah. Thanks, Payam. Yeah, Hwakong Cheng, thanks for the comment. And I think we very much appreciate the desire to have more flexibility in the prescriptive pathways.

You know, one of the things that was presented today was about adding language that, or considering adding language, that could accommodate for other systems that are equally energy efficient for the prescriptive requirements that we have identified, and that would be generally like an option on the list of prescriptive compliance requirements. And so where -- we would like to continue to collaborate with you and stakeholders to see if we can find other alternative solutions to a Four Pipe Fan Coil, for example, that we have prescribed, and where we can get to those solutions. You know, adding language that allows for this to be added to the list of prescriptive options seems like it would very directly address your concern, that the

list is very limited.

So I think, as with all comments, very much appreciated, and very much welcome, and recognize the challenges that exist here. Please, you know, do docket your comments, but also, you know, we have heard this comment and we're continuing to hear this comment, and we are listening, and we are attempting to develop language that does provide some flexibility over time to allow us to identify other systems that that may be, again, as or more energy efficient than the ones that we're prescribing in the current proposal.

So thank you again for your engagement.

MR. CHENG: Alright. Thank you, Javier and Bach.

MR. BOZORGCHAMI: Thank you everyone.

Next, Jonny, go ahead and state your name, affiliation, and spell your last name.

MR. KOCHER: Yeah. Jonny Kocher, K-O-C-H-E-R, RMI.

Yeah. just want to respond to that last comment, and encourage -- you know, I think I've mentioned this earlier. We're encouraging the CEC to work to make any edits that we need to in the prescriptive pathway to create more options for the heat pump baseline. But wanting to not move it to a future Code cycle, because that would just not be aligned with the State's climate goals, of kicking

it three years out, when a lot of the infrastructure that would be installed in these buildings would become standard assets before our 2045 Carbon Neutrality Goal.

I think that since commercial buildings, most go through the performance pathway anyway -- I've heard, like, upwards of 90 percent -- I think this is probably something that could be dealt with with pretty small edits to the prescriptive language to try to address the concerns that Taylor Engineers has, but I don't think that we need to be throwing the baby out with the bath water, so to speak.

So look forward to working with any folks who are interested in trying to come up with a solution to the concerns without actually, like, completely rolling back the requirements, which are completely necessary for our climate goals.

Thank you.

MR. BOZORGCHAMI: Thank you, Johnny, and duly noted. Thank you so much for your comment.

Next we have Hassan. Hassan, please state your name and affiliation for the record.

Sorry. Here you go.

MR. FAWAZ: Thank you. Hi, my name is Hassan Fawaz, F-A-W-A-Z, for Green MEP. I do both energy and mechanical work.

And the first thing I want to do is mostly go

over a very small multifamily question. I'll save any other questions for tomorrow that are very -- that I might need to listen to everything.

But one thing is just for the current Code, to see if that's going to be a discrepancy changed later, is in the multifamily for new buildings envelope, mass floors have a Mandatory Requirement of basically 0.269 U-Factor, but the alteration for said floor in multifamily alteration is 0.111, which is more strict than new.

Do we know if that's a discrepancy, or if that's something that might be fixed later on? Because if you make it as new, it's going to need less insulation than if it's altered for a multi-family building.

MR. BOZORGCHAMI: So Hassan, read those U-Factors one more time to me? I'm sorry.

MR. FAWAZ: No problem.

MR. BOZORGCHAMI: I don't have them. Sitting in a different room with no books in front of me.

MR. FAWAZ: No problem.

I'll also read on page 362 of the Energy Code of 2022 for new buildings. It's for mass raised floors of a minimum of three inches of lightly lightweight concrete over metal deck, an average U-Factor of 0.269, which is about, like, carpet width and then -- with heavy -- and then if you go to the next one on the page -- let's see

what page that is again -- 484 for alterations, then it's going to be R-6 insulation, where you're at a value of 0.11 for mass.

MR. BOZORGCHAMI: Okay. Okay. I'm going to have to look at that, but I kind of encourage you to put that in a comment to us.

MR. FAWAZ: No problem.

And I'll see if I can get you something.

MR. FAWAZ: Chat's disabled, so I'll just put it as a Q&A.

MR. BOZORGCHAMI: Okay. That's fine.

No, no. Send it to the docket. I'm sorry. If you can provide that comment to the docket, that'd be great.

MR. FAWAZ: Okay. I'll look into how to do that. I haven't done that yet.

MR. BOZORGCHAMI: Okay. And if you need help, reach out to us. We'll be more than happy to help you with that.

MR. FAWAZ: Appreciate it.

MR. BOZORGCHAMI: Alright.

MR. FAWAZ: And then more of a secondary thing is to piggyback off what someone else said about DOAS and VRF, and how sometimes it's harder for some other people to do the performance approach, I personally have been doing the

performance approach. I've been doing over 100 models specifically for multifamily.

One thing I will want to say is, I do like the idea of promoting the performance approach. I feel like there's still a skill gap from, let's say, the top energy consultants you might see, versus an engineering firm trying to get a little bit off Energy Code As. Yes, they do single-family on Energy Code As and other areas. They might do very simple HVAC rooftop units for nonresidential models, but I've never once seen any type of push for multifamily modeling, and I feel like even some of the better people don't really know what to tell you, as I have yet to see anyone give a definitive how-to on those, how to do this, how to do that, how to input this. I feel like a lot of people do little different things even at a higher level, and I'd just like to see maybe an encouragement of teachings, especially for multi-family modeling for others at least, and to get a definition of what we should be doing for everyone to the standard.

MR. BOZORGCHAMI: So what you're asking, Hassan, is to have a training on the CBECC software when it comes to modeling a multi-family?

MR. FAWAZ: Right. Or EnergyPro.

MR. BOZORGCHAMI: Well, EnergyPro, you're going to have to contact the vendor themselves directly. But

CBECC-Com and CBECC-Res, the Energy Commission does have YouTube videos and educational information out there.

But reach out to us and let's see what else we have that we can help you with.

MR. FAWAZ: Okay then.

MR. BOZORGCHAMI: Okay?

MR. FAWAZ: Yeah.

MR. BOZORGCHAMI: Thank you. Thank you for your comment. Thank you for your comment.

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

MR. TIFFANY: Yeah, hi. Ted Tiffany. Last name, T-I-F-F-A-N-Y. Speaking for myself today, but I do work for the Building Decarbonization Coalition.

Want to go over a couple of things. First, Hasan, there are EnergyPro and CBECC trainings supported by the Codes and Standards IOU teams. Please do check in on both PG&E and the Codes and Standards classes. There's a ton of them out there, and they do a really great job of those on-hand trainings.

I wanted to go back to this electric baseline issue for multizone systems for schools. I want to restate something that Hwakong noted about this being mandatory. It is a prescriptive requirement. I have seen the comments from Taylor Engineers about expanding the prescriptive

options there, and yes, there are some things we can do to expand the prescriptive options there. But it is not a mandatory requirement. It is a prescriptive requirement that can be met through the performance approach as well. And there's elements that we can talk about in the ACM further down the road, but I do not encourage the CEC to completely rescind that package.

The Taylor Engineer's office has been involved in the case measure for over two years now developing that, and this last-minute request to rescind it entirely and go back to the original gas baseline is, in my view, really detrimental to the progress that the CEC has made. And I want to encourage you to expand the prescriptive allowance, and we can have a very robust conversation about the ACM and baselines in that development further down the road, but this prescriptive element is pretty well-developed. It needs some minor tweaks and not a full repeal.

So I will docket these comments, as others have said today, but I encourage the Commission to keep on the path that they're on here. It is fairly well-developed, and needs some prescriptive widening, but does not need to be repealed at all.

MR. BOZORGCHAMI: Thank you, Ted, for that comment.

And yes, please submit your -- submit to the

docket your comments in response. That'd be great.

Thank you. Thank you.

Melissa, I'm going to unmute you. Go ahead and state your name and affiliation, and spell your last name.

MS. YU: Hi, Melissa Yu. It's spelled Y-U.

Calling in to echo Ted's comment and Jonny's comment as well. Just thanking the CEC for extending prescriptive heat pump space heating requirements to all schools, retail, library, financial institutions, and also office occupancies. This is really going to benefit California students and workers with clean air, cooling, and air filtration, and allow zero-emission appliances like heat pumps that can really provide lifesaving cooling during our more and more extreme heating, and be able to build climate resiliency.

So, yeah. I'm just calling in to echo to maintain these requirements and the final standards.

Thank you.

MR. BOZORGCHAMI: Thank you, Melissa.

Melissa, what association are you affiliated with?

MS. YU: Oh, sorry about that. Sierra Club.

MR. BOZORGCHAMI: Sierra Club. Wonderful. Thank you. Thank you.

And also, I encourage, if you can submit your

comment into the docket, that'd be great also.

MS. YU: Okay. Thank you.

MR. BOZORGCHAMI: Thank you so much.

I don't see any more raised hands.

Mikey, I'm going to come back to you one more time. Any comments in the Q&A?

You're muted, sir.

MR. SHEWMAKER: Sorry about that.

No, we have no open questions in the Q&A at this time.

MR. BOZORGCHAMI: Okay.

So from here, I'm going to conclude today's hearings. Like I said earlier, our recordings and our -- will be on in our dockets here shortly, or the PowerPoint presentations will be provided. Hopefully by Friday we'll get everything in. And the transcript, as soon as we get those, we will post those in our dockets too. And I encourage everyone to submit their comments either to the docket, the HTTP, efiling.energy.ca.gov. And it's really easy to do, and it gets processed within, I think, 10 minutes or 20 minutes or so.

So with that, this concludes our day. Thank you for participating in the second Lead Commissioner Hearing for the 2025 Energy Codes. Thank you.

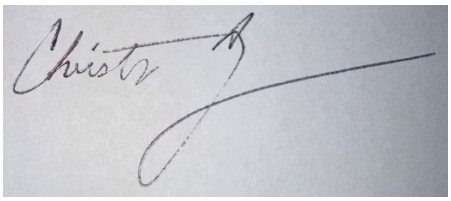
(The hearing adjourned at 1:41 p.m.)

REPORTER'S CERTIFICATE

I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were reported by me, a notary public and 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 23rd day of May, 2024.



_____

Chris Caplan
Electronic Reporter
CER**1971

CERTIFICATE OF TRANSCRIBER

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

MARTHA L. NELSON, CERT**367

May 23, 2024