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CALIFORNIA ENERGY COMMISSION

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CEC LEAD COMMISSIONER HEARINGS ON

2025 BUILDING ENERGY EFFICIENCY STANDARDS

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THURSDAY, APRIL 18, 2024

9:00 A.M.

Reported by:

Shane Stranahan

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J. Andrew McAllister

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Danny Tam, Associate Mechanical Engineer, Building Standards Branch

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Christopher Ruch, National Energy Management Institute

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P R O C E E D I N G S

9:05 a.m.

THURSDAY, APRIL 18, 2024

MR. BOZORGCHAMI: Good morning, everyone. My name is Payam Bozorgchami. I'm one of the Senior Engineers here at the California Energy Commission, the Building Standards Branch, the Efficiency Division. Let's get started.

(Pause.)

As soon as I get my computer working. There we go.

So before we get started, this hearing is being recorded, and the transcript from this hearing will be posted on our docket as soon as it becomes available. The recordings, we will try to get to you on the -- on our docket hopefully by tomorrow, if possible. And I just also want to let you guys know that the Lead Commissioner overseeing the 2025 Building Energy Efficiency Standards is Commissioner Andrew McAllister.

Prior to the start of the hearing, I just wanted to give everybody an update -- one second -- just some quick overview for safety purposes. For the folks here in the room, the bathrooms, restrooms are down the hall on the right. There's a password key mechanism at the door.

Don't worry about it. It opens automatically. They set that up at night. And if those are occupied, there's more restrooms downstairs by the cafeteria.

So with that, more housekeeping rules. Like I said, these hearings are being recorded, and transcripts from this hearing will be posted on the docket as soon as they become available. So to make things move easier, we will have staff do their presentation, and there will be opportunity at the end of each presentation for the public to ask questions.

For the folks here in the room, if you raise your hand, we have someone with a microphone walking around, and he will present that to you. And when he does so, please state your name, your affiliation, and I'm going to ask if you could spell your last name. I know this becomes tedious if the same person does it every time, but unfortunately, we need that for reporting.

For the folks on Zoom, please click the raised hand button and I will unmute you. And when I do that, please state your name and affiliation, and, again, spell your last name. And the folks on the phone, if you hit star nine, I can recognize it, and that will unmute you, and we'll go from there.

There is also a Q&A button if you would like to type in your questions. We have Michael Shewmaker here in

the -- our staff member who will read those out loud for the public records. And we'll try to answer as best we can.

For today's agendas, we will have myself, as I'm doing the general structure of the hearing. Then Commissioner McAllister will give a few words at the beginning. He may be running a little late today again. He's on a conference call. So we will have Javier Perez do the development procedures for the 2025, then we'll revert back to Commissioner McAllister when he does show up.

Then we'll go to Steven Becker. He's our Mechanical Engineer with the Building Standards Branch. He will talk about or present on the single-family mandatory measures. Then Danny Tam, our other Mechanical Engineer within the Building Standards Branch, he will present on the prescriptive measures for residential -- excuse me, I said residential, but single-family residential buildings.

Depending on how fast we move and the number of comments, the presence we get, we'll probably take a break about 10:50ish or so. If not, if we're ahead of schedule, Bach Tsan will present on the single-family residential buildings additions and alterations.

Like I said, these schedules, as you see, are tentative. They do fluctuate, as some of us don't want to be around here until seven o'clock at night, so we would

like to, if possible, move things along. At noonish, we'll take about an hour lunch break, or forty-five minutes, depending on the schedule. But if we're moving a little bit faster, we may have Anushka Raut, our Air Pollution Specialist, present on the multifamily mandatory measures, and then we've got Javier Perez, who is our Project Manager for the 2025 Standards. He will present on the multifamily buildings, and prescriptive and additional alterations.

That break in the afternoon may fluctuate. So we have him here as a tentative, and Commissioner McAllister will open it up for other comments on the 2025, and I will conclude the workshop afterwards.

The workshop today is on the 2025. There's a lot of folks that have ideas and proposals that may come, and it may be a little late for this Code cycle. So someone said that this train may have left the station, but there's another train coming right behind it, and that's the 2028 Measures. And the 2028 Measures ideas, please, there is a link at the lower left of the screen. If you have any ideas or suggestions, we're more than happy to take those. We will evaluate those with our assistance from the IOU team, and those will happen right after the adoption of the '25.

Comments from today's workshops can be submitted by May 13th. Today's workshop, yesterday's, and Tuesday's

workshop can be submitted by May 13th by 5pm. and I put the docket link right there, right after the comments too, 24-BSTD-01. It's really simple. Just get in, put your contact information, and follow the instructions. It's really easy to do.

Please, when you do this, provide your contact information, your email, your phone number. Somehow the staff can get ahold of you if we have further questions so we would like to have further dialogue with you. If you have a little bit of difficulty with doing so, I put the link to our Public Advisor, Mona Badie. She is more than happy to help you with maneuvering through the Energy Commission website, or other topics that maybe does not relate to Building Energy Efficiency Standards. But she's more than happy to assist you and provide you guidance.

That was it. That's all I have. Unfortunately, Commissioner McAllister is not in the office -- I said office, excuse me -- in the room right now. So we're going to go right to Javier Perez and he will do his presentation.

Thank you.

MR. PEREZ: Thanks, Payam.

So hi. My name is Javier Perez. I'm the Project Manager for the 2025 Energy Code, and if you participated in the first or second hearings of today's -- of this

three-day hearing session, you'll hear a lot of repeats, and very much apologize for the repetition. I hope you can understand.

So today we'll briefly go over the authority and process, some of the drivers behind the 2025 Standards, the underlying metrics of our Code, and finally a timeline update for the 2025 Cycle. I do want to take a second to thank you all for taking time to participate in this meeting, and hope that through your participation and collaboration, that we can make great strides with energy efficiency and our long-term state goals with the 2025 Standards update.

Next slide.

Alright. So let's start with the Energy Commission's authority and process. This slide's a little bit loaded, so I'm going to bring it up in segments to hopefully train your eyes to see what I'm speaking to.

So two California Assemblymen, Charles Warren and Al Alquist, coauthored the Warren-Alquist Act, and this act authorizes the Energy Commission to develop and update standards on a triennial basis and for local jurisdictions to enforce these standards through the building permit process. The standards were developed at the direction of the Warren Outpost Act to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy.

One more click.

Now on the right, you're now seeing a chart that compares the site energy consumption of a single-family residential building when built to the 2021 International Energy Conservation Code in blue, and the same building built to California's 2022 Energy Code requirements in green. Now, if you only take away a few points 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 site energy than those built to the 2021 International Energy Conservation Code, or the 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 these bars, are a large portion of our buildings' overall energy consumption.

Now, our state has lofty greenhouse gas emission reduction goals. Reducing emissions from buildings will be one of the many keys to meeting those goals. Our state also has requirements for electricity retail sales over the next couple decades. It'll make electricity significantly cleaner over time.

One more click on.

Now, if you'd like to learn more about our 2022 Energy Code and how it compares to the federal standards,

our 2022 Impact Analysis Report can be found at the link on the screen.

Now let's talk about some of 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 2018, which states that by 2045, 100 percent of electricity retail sales must come from clean energy sources. Now, this will make electricity significantly cleaner over time, and will also have a substantially positive effect on State's greenhouse gas reduction goals. The Energy Code is tasked with contributing to these goals, and must do so by increasing built-in 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 update to contribute to these state goals? Building on the efforts of the 2022 Code cycle, we've continued to explore where highly efficient heat pumps can be introduced as the prescriptive baseline for space and water-heating systems. You'll hear about the residential heat pump proposals today.

In 2019, in the 2019 cycle, we introduced the 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 in 2025, we'll look to expand these requirements to ensure that -- I'm sorry. We'll look to expand these requirements and to update to ensure that we're in step with the ever-evolving landscape of photovoltaic and energy storage systems.

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

And we want to ensure that our Standards continue to serve as a protection for affordable housing, as 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 those efforts to make it easier for the designers of those buildings to demonstrate compliance with our Code, and demonstrate

compliance with the requirements of affordable housing programs.

As with all cycles, existing buildings continue to be a focus of the Energy Code, and this cycle we 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 Developments, 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 on this list is just our never-ending intent to make the Code easier to understand, to make compliance with our Code simpler, and to make enforcement of the requirements of our Code easier. And, you know, we're trying to get this right. I think every Code cycle, we take another pen and try to get this more and more clear. We hope to get there, to perfection, one day. If we don't get there, it won't be for lack of effort.

Next slide.

Now let's go over the underlying energy metrics that help demonstrate energy savings. For the 2025 Energy

Code, we're pivoting from using the term Time Dependent Valuation energy, or TDV energy, to using Long-term System Costs. LSC is -- or Long-term System Cost is the cost-effectiveness and energy valuation methodology used in development and implementation of the Energy Code. LSC factors are used to convert predicted site energy use to long-term dollar cost to California's energy system. Now, the underlying varying valuation of energy, depending on the time of day, day of 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, the utility system, and to society. This graph represents an average day's dollars per megawatt hour, and how the cost varies between time of day, and the different inputs that go into that cost.

Next slide.

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

Next slide.

Because a building's energy use can vary depending on weather conditions which differ 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 are found to be more or less cost-effective.

Next slide.

Okay. Now let's go over how far we've come in this Code cycle. From June of 2021 to July of 2023, the Code and Standards Enhancement Team, or the CASE team, took in measure proposal ideas, 19 different public workshops, and finalized reports for their proposals. From March to November of 2022, the Energy Commission updated weather data, and LSC and Source Energy metrics, and from March of '23 to September of '23, the CEC held pre-rulemaking workshops on proposals for the 2025 Energy Code, culminating with the publication of Draft Express Terms in November of 2023. Now, in March of this year -- March 29th -- we opened our formal rulemaking and released 45-day changes to the 2025 Standards.

Next slide.

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 the measure intake ideas to vetting of proposals to providing feedback on Code language. These groups included everyone from energy consulting groups, multiple trade organizations, building industry leaders, and advocates, including environmental and even ADU advocates. This level of participation is crucial in the development of this Code, and we're very thankful for your continued engagement.

Next slide, please.

Now what's to come? We've opened our formal rulemaking 45-day comment period on March 29th, and this comment period runs through May 13th. And today is the last of our three Lead Commissioner hearings on the proposed 45-day language changes to the 2025 Standards. We plan to hold our 15-day comment period in June of this year, and expect to adopt the 2025 Energy Code at our August 14th Business Meeting.

The Building Standards Commission then will have their Commission meetings to approve updates to all parts of Title 24 in December of 2024. The effective date for

the 2025 Energy Code will be January 1, 2026.

For this Code cycle, this is a list of senior staff in the Building Standards Branch at the Energy Commission. Now, if you're as bad with names as I am, again, my name is Javier Perez. I'm the Project Manager for the 2025 Energy Code. Payam Bozorgchami is our Technical Lead, and he specializes in building envelope additions, and alterations to existing buildings and accessory dwelling units, or smaller dwelling units. And Haile Bucaneg is our cover processes, demand response controls, and our nonresidential and residential ACM methods work. Mohammad Saeed is our solar and PV and energy storage systems lead, and Bach Tsan is our lead on HVAC systems and refrigeration. And Michael Shewmaker is a Supervisor for the Standards Development Unit, and Gypsy Achong is the Building Standards Branch Manager. If you'd like to reach out, our email convention at the Energy Commission is first name dot last name at energy.ca.gov.

Now, our goal is to build consensus through these hearings and through this public process and your participation, again, your comments, all go a long way to help us with that goal. So thanks again for making time today.

And I see the Commissioner's in the room. Perhaps we want to hand it over to him to make his opening

remarks, and then we can go to Stephen for the next session.

Thank you.

COMMISSIONER MCALLISTER: Very well.

(Echo.)

Sorry. Sorry, I unmuted myself here.

Well, thanks everybody again for joining us on this third day. I want to just first start out by, you know, emphasizing the point that Javier just made about contacting staff. You know, we have -- it's impossible to overstate, really, the quality of staff we have at the Energy Commission working on these issues. There's an incredible team, and that is a sincere ask to join the conversation and to contact any and all of our staff with any issues you might have. You can be a hundred percent sure that we will all make a good faith effort to -- we certainly will listen, and make a good faith effort to forge that consensus that Javier was emphasizing just now.

I also wanted to just make one comment about sort of historical perspective here, and it won't be long. But I think those of you who've been involved in multiple Code cycles over the last couple decades will remember a time when the timeline was a little more flexible than it is now, let's say, and the updates didn't even happen every year. They were sort of on a more haphazard cycle.

And, together with the Building Standards Commission, we've really standardized the cycle to three years, and I think that has really sort of upped the level of rigor and predictability of the Code updates. And they've really -- that concerted effort to be more consistent, and be more responsive to statute, and also to be able to project that timeline to stakeholders in a predictable way, and stick to that timeline, has really upped the level -- upped the contribution of the building codes to our sort of coherent climate transition cycle, or, you know, policy regime. So I think just I wanted to recognize the fact that the Building Standards really have matured, and the team behind them is just at the highest level. And so just wanted to put a little bit of historical perspective on this.

This third day, I'm really looking forward to wrapping up the hearings and, you know, moving on to getting all your public comments, and working through those public comments in the 45-day language, making changes where warranted, and then 15-day language, and then adoption, and moving on to the rest of the cycle with the Building Standards Commission.

So after that, we'll -- you know, alongside that, a little bit delayed, we'll be doing Part 11. So that's for another day. But wanted to just, again, thank

everybody for contributing to this process. And looking forward to the conversation today. Some media issues on the table as well.

So back to you, team. Go ahead.

MR. BOZORGCHAMI: Thank you, Commissioner. Next we've got Stephen Baker, our Mechanical Engineer.

I'm sorry. I said Baker. Becker. I apologize.

MR. BECKER: Hi, everyone. My name is Stephen Becker, and I'm a Mechanical Engineer with the CEC's Standards Development Unit.

This morning I'm going to take you through the proposed changes related to Mandatory Requirements for Single-family Residential Buildings in Section 150.00.

Next slide, please.

Starting in Section 150.0(c), we are proposing to reduce the mandatory maximum wall insulation U-Factor requirements as follows. For two-by-four framing, the overall assembly shall not have a U-Factor exceeding 0.095, and for two-by-six or greater framing, the overall assembly shall not have a U-Factor exceeding 0.069.

Next slide, please.

Let's continue on to mandatory space conditioning equipment requirements in Section 150.0(h). In Section 150.0(h)1, we are proposing adding an exception for additions only that allows for the use of block loads when

performing sizing calculations. Additionally, removing language related to system sizing and selection in Section 150.0(h)5.

In Section 150.0(h)2, we have added several sources that can be used to select outdoor design conditions. The new sources include the ASHRAE Handbook, the SMACNA Residential Comfort System Installation Standards Manual, and ACCA Manual J. We are also proposing to change the language in this section to specify that outdoor design temperatures used for heating should not be lower than either the 99 percent Heating Dry Bulb value or the Heating Winter Median of Extremes value.

Next slide, please.

In Section 150.0(h)5, we are proposing new requirements for sizing and selection of mechanical space conditioning equipment. The section requires the systems be sized based on ACCA Manual S. This section also defines limits for space conditioning system capacity. There is no minimum capacity for cooling or maximum capacity for heating.

The limits for minimum capacity for heating depend on system type. For gas furnaces, the capacity needs to be sized based on ACCA Manual S, Table 2. And for heat pumps, the minimum heating capacity must meet the requirements of the CEC without accounting for supplemental

heating.

Next slide, please.

Before we move on to the next section, I wanted to correct an error in the 45-day Express Terms in Section 150.0(h)5Biii. The added language incorrectly states that there is no minimum -- or there is no limit on the minimum heating capacity for heat pumps. In the 15-day Express Terms, this will be corrected as shown in the slide.

For clarity, I'll reiterate the correct minimum heating capacity requirements for heat pumps. For heat pump space heaters, the minimum heating capacity must meet the requirements of the CEC without accounting for supplemental heating.

Next slide, please.

In Section 150.0(h)6, we are proposing adding language that outlines requirements for heat pump space conditioners with defrost delay timers. The delay timers need to be set so that the delay is 90 minutes or longer. Installers would certify in the CF2R that they've tested the defrost delay control configuration using new testing procedures, defined in the CF2R. There are exceptions for dwelling units in Climate Zones 6 and 7, as well as dwelling units that have a conditioned floor area of 500 square feet or less in Climate Zones 3, 5 through 10, and 15.

Next slide, please.

The defrost requirements in Section 150.0(h)6 would also apply to multifamily residential buildings and appear in Section 160.3(b)7. There are exceptions provided for multifamily residential dwelling units in Climate Zones 1, 6 through 10, 15, and 16.

Next slide, please.

In Section 150.0(h)7, we are proposing new requirements for supplementary heat controls for heat pump space conditioners with supplemental heating. The added language requires that supplemental heat be locked out when the outdoor temperature -- when the outdoor air temperature is above 35 degrees Fahrenheit, unless it is being used for defrost emergency heat operation. Installers would certify in the CF2R they have tested the supplementary heat control configuration and using procedures defined in the CF2R.

Exceptions are provided for room air conditioner heat pumps, dwelling units in Climate Zones 7 and 15, and dwelling units with conditioned floor area of 500 square feet or less.

Next slide, please.

In Section 150.0(h)8, we are proposing new language that puts limits on the capacity of electric resistance supplementary heaters used with heat pump space conditioners. Electric resistance supplementary heat

capacity when measured in kilowatts shall not be larger than the heat pump nominal cooling capacity in tons, multiplied by 2.7 kilowatts per ton.

Next slide, please.

In Section 150.0(h)9, proposing new requirements that ensure multi-speed and variable speed space conditioning systems are fully compatible with third-party thermostats. The added language requires that multi-speed and variable speed systems be capable of responding to heating and cooling loads by modulating compressor speed when used with third-party thermostats. Installers would certify on the CF2R that they have tested the systems control configuration using testing procedures defined in the CF2R. Requirements are also applicable to multifamily residential dwelling units. The multifamily residential requirements can be found in Section 160.3(b)8.

Next slide, please.

Now we'll move on to Section 150.0(i), which focuses on mandatory thermostat requirements. We are proposing restructuring the language into two subsections. One subsection with the original language for setback thermostats, and a new subsection for thermostats that are applied to heat pumps with supplementary heating.

The new subsection contains the following requirements for thermostats that are applied to heat pumps

with supplemental heat. First, the thermostat needs to receive and display outdoor air temperature from a sensor or internet weather service. Next, the thermostat needs to follow requirements in Section 150.0(h)7 and lock out supplementary heat above an outdoor temperature of 35 degrees Fahrenheit, unless it is being used for defrost or emergency operation. Finally, the thermostats must indicate when supplementary heat is being used for defrost or emergency operation. Installers again would certify in CF2R that they have tested thermostat control configuration using testing procedures defined in CF2R.

Next slide, please.

There are two exceptions for thermostat requirements. The first exception is provided for situations where supplementary heat is locked out above 35 degrees by another device. The second exception is provided for room air conditioner heat pumps.

Next slide, please.

Let's continue on to the proposed changes to the mandatory residential lighting requirements, Section 150.0(k), starting with the changes to the language for luminaire requirements. The luminaire efficacy requirements in Section 150.0(k)1A now apply to all lamps and light sources in addition to being to install luminaries. Next, Table 150.0-A and the subsection for

screw-based luminaries have been removed. The new language in Section 150.0(k)1A replaces both the table and the screw-based luminary subsection by referring directly to the joint appendix JA8 for compliance.

There have also been a few changes to Section 150.0(k)1A's exceptions. Exception 1 has added ceiling fan kit to the list of integrated device lighting, and Exception 4 retains the default high-efficacy light sources by listing them as exceptions.

Moving on to the indoor lighting controls language, we propose combining subsections 150.0(k)2B and D because they cover similar subject matter. We have also added to the exceptions for dimming control requirements so they are more comprehensive and improve clarity. Other minor changes have been made to clean up the language and improve clarity through this section.

Next slide, please.

In Section 150.0(k)3, we are proposing changes to the residential outdoor lighting language that clarify the three options for meeting the residential outdoor lighting control requirements. The new language clarifies that an energy management control system and other controls can meet the outdoor lighting control requirements. These changes have also been made to multifamily residential requirements found in 160.5(a)3.

Next slide, please.

Next, I'd like to go over the proposed changes to JA8 and JA10.

Joint Appendix JA8 is used in conjunction with the residential lighting requirements and applies to residential luminaires, including recessed downlights and other LED light sources. We are proposing two essential updates to JA8. For the first update, we're proposing to remove the language relating to the performance criteria and test requirements for incandescent lamps and fluorescent lamps, as manufacturing and sale of these lamps is being phased out. For the second update, we are removing references to the ENERGY STAR test methods and replacing them with two added subsections covering the start time test and the noise test. This change is being made to reflect the sunset of the ENERGY STAR program for lamps and luminaires effective December 31st, 2024.

The changes to Joint Appendix JA10, which contains the measurement tests for JA8 lighting products, also reflects the removal of language related to fluorescent lamps and their test requirements.

Next slide, please.

Next, we'll move on to Section 150.0(m), which covers mandatory air distribution and ventilation systems. There have been changes to Exception 1 to Section

150.0(m)13C, which relates to the airflow rate and fan efficacy of space conditioning systems. The exception allows for space conditioning systems to demonstrate airflow and fan efficacy compliance by operating the system at maximum pressure capacity and max fan speed with all zones calling for conditioning. The changes to this exception result in the exception being only applicable to multi-speed and variable speed systems that incorporate controls to vary fan speed according to the number of zones calling. The exception is no longer applicable to single-speed compressor systems. The ability to vary fan speed according to the number of zones calling would be certified by the installer.

Next slide, please.

Now I'll cover changes to Section 150.0(o)1C, which deals with whole-dwelling unit mechanical ventilation for single-family detached homes and townhouses. We are proposing some new requirements for subsection 150.0(o)1Civ, which details requirements for balanced and supply only ventilation systems. The first new requirement comes in subsection 150.0(o)1Civa, which covers indoor air quality filter and HRV and or ERV accessibility. We have added language for accessibility requirements for IAQ system components such as filters, and heat and/or energy recovery cores, for replacement and maintenance.

Additionally, we have added an exception to subsection 150.0(o)1Civa to help specify requirements for systems that require servicing from the inside of an attic.

Next slide, please.

The second new requirement comes in subsection 150.0(o)1Civb, which covers IAQ system component accessibility. We're adding language to include the other IAQ system components, including fans, motors, heat exchangers, and other serviceable components to be required to meet the applicable requirements of the California Mechanical Code Section 304.0. The third new requirement comes in subsection 150.0(o)1Civc, which covers outdoor air intake design. We've added language to ensure that outdoor air intake design meets the requirements of California Mechanical Code Section 402.4.1.

Next slide, please.

Lastly, in subsection 150.0(o)1Civd, which covers outdoor air intake location and accessibility, we added language for accessibility requirements for outdoor air intakes that specifies they can be located no more than 10 feet above a walking surface for regular service. We also specified that if these units are located on roofs, they must meet the requirements of the California Mechanical Code Section 304.3.1. Additionally, we've added an exception to the subsection exempting outdoor air intakes

that serve equipment with a fault indicator display that meets the requirements of Joint Appendix JA17.

Next slide, please.

Alright. Moving on to subsection 150.0(o)1G, which covers local mechanical exhaust, we are proposing some changes to Table 150.0-E, which outlines requirements for demand control, local ventilation, exhaust air flow rates, and capture efficiency. We are removing the compliance criteria of a capacity of five air changes per hour for enclosed kitchens. Striking "or a capacity of 5 ACH" from the table makes the compliance requirements the same for both enclosed and non-enclosed kitchens. So, for enclosed kitchens and non-enclosed kitchens, demand controlled local ventilation downdraft fans and other types of kitchen exhaust fans must meet the 300 CFM requirement.

Next slide, please.

Next, we'll go over proposed changes, Section 150.0(p), which covers mandatory requirements for pool systems and equipment installation. The changes are mostly cleaning up of existing language. In Section 150.0(p)1A, we added references to dedicated purpose pool pumps and replacement dedicated-purpose pool pump motors. We have also updated the references to the applicable appliance standards. In Section 150.0(p)1D and 1E, outdated references were deleted and new references were added to

dedicated-purpose pool pumps and replacement dedicated-purpose motors.

Next slide, please.

Moving on to the proposed changes in Section 150.0(q), which covers mandatory requirements for fenestration products, we are proposing to align the mandatory maximum U-Factor requirements for all fenestration products, including skylights. So, starting in 2026, all fenestration products, including skylights, separating conditioned space from unconditioned space or outdoor space, shall have a maximum weighted average U-Factor of 0.4.

Next slide, please.

Finally, we'll go on to cover the proposed updates --

UNIDENTIFIED SPEAKER: (Indiscernible.)

MR. BECKER: There we go. Alright. Thank you.

So finally, we'll go on to cover the proposed updates to Section 150.0(s) for Mandatory Battery Energy Storage System Ready Requirements. In response to stakeholder feedback received on the current 2022 requirement, we are proposing to modify the language so that the battery-ready requirements won't apply if the Load Serving Entity is providing service of 125 amps or less.

And that concludes the CEC's proposed changes to

Mandatory Requirements for Single-family Residential Buildings in Section 150.0. So I think we're going to take questions now.

MR. BOZORGCHAMI: Thank you, Stephen.

I'm going to open it up for folks here in the building. And we're going to allow -- we're trying to make sure we flow this through properly. So we're going to allow two minutes per presenter. Or, excuse me, per commenter. Excuse me.

So with that -- and honestly, I don't do a good job with this, so we'll cut off.

So any raised hands here in the room?

Shawn?

MR. MAYER: Shawn Mayer, Harris & Sloan. Last name is M-A-Y-E-R.

Really two questions that are interconnected. Section 150.0(h)5 is now requiring heat pumps to meet capacity without supplemental heating. And my question is if the Commission has really dived into that to understand the impact on cooling capacity. Heat pumps, many heat pumps, are split systems that have similar heating and cooling capacities. When we push the heating capacity up, we're going to end up oversizing cooling capacity. And we believe that that leads us into direct conflict with the ENERGY STAR requirements, which is, while we're working on

ENERGY STAR requirements, have a limit to the oversizing of cooling of 130 to 140 percent. And with our review, we've seen that this is kicking us over that in many cases. So we'd like to recommend that we either add an exception or take this requirement out altogether.

There are already other requirements for supplementary heat. There's lockout requirements, and there's maximum sizing requirements. So we feel all of those are handling the sizing of supplementary heat much better than this requirement.

And then secondarily to that, the original draft language included requirements for mechanical loads to be provided to verify, presumably. That's been removed, so I'm just curious if the Commission is planning any type of verification that the equipment is sized correctly per the requirements.

MR. BECKER: Can I kick that one to you, Bob?

MR. TSAN: The first one is the need to accommodate for sizing.

This is Bach Tsan, last name is T-S-A-N, with the Energy Commission.

I just wanted to clarify the question, Mr. Mayer.

MR. MAYER: Yes. Yes. Did we account for the fact that minimum sizing for heating is going to produce

oversizing for cooling?

MR. TSAN: Let me -- I think we have to take that back --

MR. BOZORGCHAMI: So, Shawn, could you submit a comment to the docket please for us?

MR. MAYER: I will.

MR. BOZORGCHAMI: And we'll take a look into that.

Thank you.

MR. BECKER: Thank you.

MR. MAYER: Thank you.

MR. BOZORGCHAMI: Any other questions in the room?

If not, I'm going to go to the people in the attendance.

So, with that, Brian, go ahead and state your name and affiliation, and spell your last name.

MR. SELBY: Thank you. My name is Brian Selby, in affiliation with Selby Energy Inc. Last name is S-E-L-B-Y.

I just want to thank the Commission and all the case authors for the wonderful work they've done on the residential standards. A couple of things I'd like to address. Section 150.0(u), fenestration, new mandatory requirements. Lowering the U-Factor to 0.4 puts a lot of

pressure on installers to find compliant products, specifically skylights. A simple search through the NFRC certified products directory, you'll find that there are very few skylight products that can meet this 0.4 or lower U-Factor requirement. We feel like this is an undue burden on the industry, to have to meet such a low U-Factor, when our prescriptive requirements are really driving efficiency. We understand that there's a need to have a more stringent mandatory requirement, but in this situation, even the .45 U-Factor is causing a lot of issues within residential additions and alterations. In some cases new construction, but that's not the primary issue.

One other thing, Section 150.0(s). Wonderful that now we have some options when the Load Serving Entity is not able to provide the power. That's a current issue with the 2022 Code. We would like the Energy Commission to consider a retroactive opportunity under the 2022 Code to apply some of the language here, because it's starting to become a problem with ADUs, that -- where the utility or Load Serving Entity does not have the capacity, basically rendering that project as unbuildable, or cannot comply with the Code.

So again, I want to thank the Energy Commission and the case authors for the wonderful work they've done on the residential single-family standards. Just need to

clarify a couple of these issues.

So, thank you.

MR. BOZORGCHAMI: Thank you, Brian.

Javier, do you want to respond to that?

MR. PEREZ: Thank you, Brian.

Just to comment on your question -- or your comment related to skylights, you know, I know you this already, you trained on these requirements. I just to have to say it out loud. You know, we do have an exception for up to 10 square feet, or half a percent of the conditioned floor area of the building, whichever is greater, to not be required to be in alignment with the maximum U-Factor requirement, and also the mandatory U-Factor requirements are weighted-average requirements. So in this scenario -- and we added the weighted average language as a result of feedback, right? So in a scenario where one has, you know, a poor-performing skylight, but really high-performing windows or reasonably performing windows, where the skylight ratio to rest-of-window ratio is pretty small, I think there would likely be reasonable solutions to satisfy that.

But Brian, I do want to have you reply and let me know if I'm off-base here.

MR. SELBY: Sure. Yeah. Thank you, Javier. I appreciate that.

And we're aware of those exceptions, and we find in many situations that those exceptions are even exhausted, and it makes it very difficult. But we understand the need for more stringent U-Factor requirements. It's just -- you know, it does put a strain on the industry to find compliant products, and we feel, like, at least skylights, you know, having possibly an exception, or some consideration, based on the lack of available compliant products in the market. So --

MR. PEREZ: Thank you so much.

MR. SELBY: I appreciate the comments on that.

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

Next, Marina, go ahead. I'm going to unmute you. Go ahead and state your name and affiliation.

(Pause.)

Marina?

Okay, I'm not sure. We're not hearing you here. So I recommend maybe put your question or a comment in the Q&A, and Mikey will read it out for you.

So from there, we're going to go to Michelle. So go ahead. State your name and affiliation, please.

Michelle, you're going to have to -- there you go.

MS. AUSTIN: My name is Michelle Austin. I work

for Gabel Energy, A-U-S-T-I-N.

I would also like to comment on the fenestration. While I understand for new construction and large homes or production builds, that is a reasonable U-Factor, but for small additions, for small ADUs, for homes where all they are doing is altering a few glazing surfaces, it becomes virtually impossible for clients to do things the right way. There -- again, as Brian stated -- there are very, very few listed NFRC companies to begin with. Of those, there's only about four or five that have over five or six products that are currently available.

The other consideration is fire-rated glazing. So when you are talking about cities where buildings are built very close together, fire-rated windows are required, and cannot meet this U-Factor whatsoever, ever. Sometimes they are not changing very many glazing surfaces, so there is absolutely no way to meet this overall mandatory U-Factor.

I strongly recommend that there be exceptions for skylight alterations, small skylight additions, and also looking at the fire-rated windows. That is a health and safety issue.

Thank you.

MR. BOZORGCHAMI: Yeah. Thank you, Michelle.

Do you know anything about the fire-rated

windows? I know that the fire-rated windows are required for nonresidential multifamilies in certain areas, not in all locations.

I have a call with Gina Rodda within Gabel Energy to discuss this further, and also with Steve Strong with (indiscernible), who has brought this to our attention.

So we're looking into it. Stay tuned. We probably will be providing a health and safety exception, but we've got to look into it first. Thank you.

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

MR. LITTLE: Hello. My name is Mike Little, L-I-T-T-L-E. I'm a HERS rater, a self-employed sole proprietor.

I just have a question on -- it was touched on earlier regarding heat pumps and sizing. Would it -- well, nobody has mentioned anything about dual fuel systems. I know you're trying to get away from gas, but it seems to me that's the only viable alternative to using the resistance heating as a secondary heating measure.

Do you have any comments on that? It seems to be the only way where you could properly size the equipment for cooling and heating.

MR. PEREZ: Hi Mike, this is Javier with the Energy Commission.

You know, we're setting prescriptive baselines for heat pump space and water heating systems, and I say prescriptive because they're not mandatory. One could demonstrate compliance with the performance approach and could comply with dual fuel and with natural gas systems. You know, there isn't a mandatory requirement that disallows that from happening. So that flexibility is built into our Code.

MR. LITTLE: But with new construction, it's electric only. Seems to me that you would not be able to use a dual fuel system in those situations.

MR. PEREZ: Yes. The Energy Code is a performance standard, right? We set prescriptive requirements, they set the standard design, the baseline for demonstrating compliance with our Code. And where one wants to have design flexibility to install less insulation, or efficient HVAC systems, going with natural gas or a dual fuel system, one can do so.

The only thing that needs to be done is to ensure that the building meets the energy efficiency requirements of a building that would have met all prescriptive requirements. So there is not a requirement that disallows gas systems. That is not in this Code.

MR. LITTLE: Okay.

COMMISSIONER MCALLISTER: I want to -- this is

Commissioner McAllister. I just want to reinforce that issue. The Energy Code does not ban any particular fuel. It does not ban gas. There are pathways to build the building that the builder wants to build, as long as it performs -- as long as it meets the performance baseline, you know, the standard design baseline.

So I just want to be clear about that. It seems like there's a bit of misinformation or a bit of sort of misunderstanding out there about that issue. We will revisit for existing buildings in the Part 11 discussion, but for new construction, there is a -- you know, there is a path to incorporate minimum efficiency electric or gas appliances into the building that are, you know, federally allowable. So we obviously -- we're very aware of the sort of federal landscape as well as, you know, our state needs, and so we navigate both of those in the building Code.

Just want to be clear about that. Thanks for the question.

MR. LITTLE: Okay. Thank you. I must have misunderstood that.

MR. BOZORGCHAMI: Thank you. Thank you, Mike. Thank you, Javier. Thank you, Commissioner.

Next, we got Bob. Go ahead, Bob.

MR. RAYMER: Yeah. Thank you. This is Bob Raymer. That's R-A-Y-M-E-R. I'm with the California

Building Industry Association, and also representing the California Apartment Association.

And a point directly to Payam, later today I'll send you the provisions out of California Building Code Chapter 7A with regards to windows in the Wildland-Urban Interface, the fire safety stuff.

And speaking in general here, I certainly agree with what Commissioner McAllister just raised. The CEC is not proposing a ban on any type of fuel line, whatnot. We have different options. Yes, it's going to cost considerably more if you decide to go with gas, and we've recognized the CEC's trajectory to go in the direction of decarbonizing the house construction. The one concern that I have out there that I've raised before isn't really in the CEC's hands, and that is we're already running into capacity problems in Southern California, both San Diego Gas and Electric and especially in Edison.

The good news here is we're working very closely with these utilities to try to get a handle on this. While they indicate that they do have plenty of capacity, behind the scenes they're indicating that they just don't have the capacity where it's needed. And of course, to me, that's a capacity problem.

Our concern is, this shouldn't be happening now. We expected it to happen probably three, four years down

the line when existing housing and existing commercial buildings become a significant competitor with new construction for all electric needs. But this is a problem out there to the extent that the demand forecasts of both the CEC and the PUC can be worked in conjunction, and that we make sure California stays well ahead of our electrical needs. That would be a huge benefit to industry.

Thank you very much.

MR. BOZORGCHAMI: Thank you, Bob. And I look forward to that Chapter 7A. That's from the Building Code.

COMMISSIONER MCALLISTER: I'll just comment on the capacity issue. Thanks for bringing that up, Bob.

We are, you know, obviously in various forums, and just Staff-to-Staff and Commissioner-to-Commissioner in, you know, very close coordination with the PUC and the CAISO within the forecasting realm, and other areas, on that issue. I mean, there are some supply chain issues. That, I think, is part of what you're referring to, with transformers and just sort of equipment, in addition to some localized capacity issues. But very, very aware of that. And I think the planning processes that are in place now can manage that, you know, as long as we're all working together to make sure that there are no delays.

So thanks for bringing that up.

MR. BOZORGCHAMI: Thank you, Commissioner.

Next we have Chandra. Go ahead and state your name and affiliation, please. Spell your last name.

MS. APPERSON: Yes. Hi. Good morning, thank you. My name is Chandra Apperson, first name C-H-A-N-D-R-A, last name Apperson, A-P-P-E-R-S-O-N, and my comments here are as a certified energy analyst providing energy consulting services to contractors and designers.

Two areas that I think are legacy issues, where the language could be cleaned up very easily with just a few more words added. The first one is Section 150.0(a)1. If that could clearly indicate whether or not ductless systems need to comply with the mandatory roof deck insulation requirements, this is one we run into pretty frequently where, because the language is silent, we're having to make an assumption. The next one is similar, 150.0(o)1G5. If you could clearly indicate the zone requirements for those local mechanical exhaust systems rather than referring to ASHRAE 62.2, since that is a resource that lives behind a paywall. It is very hard to access. Those requirements are listed currently in the Residential Single-Family Compliance Manual, but most of the smaller contractors that I work with are not going to access that material. So they have a hard time finding systems that comply, or knowing whether or not they are compliant.

So if that language regarding the zone requirements could be brought directly into the Code, I think it would make their job a lot easier.

Thank you.

MR. BOZORGCHAMI: Thank you, Chandra.

MR. PEREZ: Yeah. Thanks, Chandra. We'll review your comments. Very much appreciate the constructive feedback there.

Related to ASHRAE standards and guidelines and their availability, 62.2 is available to the public. And what I will do is, when we update these slides before posting to the docket, we'll add a link to that ASHRAE technical resources webpage so that you can access it.

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

I don't have any more raised hands.

Michael? We have two?

MR. SHEWMAKER: Yeah. We have two online questions in the Q&A.

The first is from Mike Little: will any of the new requirements be HERS-verified?

Stephen, do you want to take that?

MR. BECKER: Hi, Mike. In terms of, if we're speaking about Section 150.0 for the single-family mandatory requirements: no, there will not be any new HERS

requirements. I don't think anything else is going to be HERS-verified.

MR. SHEWMAKER: Thank you, Stephen.

Our second question is from Hassan: is there any plan to change the Energy Code numbering system to be similar with other State Code numbering?

MR. BOZORGCHAMI: Hassan, stay tuned. It's happening. There will be revisions happening. It won't happen for the 2025, but we're working on getting some updated for 2028. There may -- we're working on a shadow set of standards, where we'll have the current provisions as the legal document, as the legal numbering mechanisms, but we will provide a 2028 version that will be a version for training purposesy until you folks all get acclimated to the new numbering scheme, and we'll have that moving forward for 2028.

That's our vision. That's our plan. Stay tuned.

MR. MAYER: This is Shawn Mayer with Harris & Sloan.

So I actually had a second question when I talked earlier, and that was if there was going to be a verification process for heat pump sizing.

MR. BECKER: I mean, I think -- this is Steven -- the answer is that there is no HERS verification or field verification diagnostic testing component to these

measures. So where the installer is responsible for this work, they need to complete the appropriate documentation ensuring that they're meeting the requirement.

MR. BOZORGCHAMI: Any other questions? I don't see any other raised hands -- I apologize -- I think.

So with that, we're going to go to Danny Tam, and he's going to be presenting on the prescriptive single-family provisions for infrastructure.

MR. TAM: Hi, I'm Danny Tam, and I'm an Associate Mechanical Engineer from the Building Standards Branch. I'll be presenting the proposed updates to the prescriptive requirements for single-family buildings.

Next slide, please.

In Section 150.1(c)3A, we're proposing to add a new Exception 1, as well as modifying one of the existing exceptions to the prescriptive fenestration standards. Exception 1 will be added for new dwelling units with conditioned floor area of 500 square feet or less in Climate Zones 5 through 10 and 15, and would allow projects to comply with a maximum U-Factor of 0.30. The current Exception 2 will be renumbered to become Exception 3, and would be modified to restrict the exception to Climate Zone 2, 4, 6 through 15, as well as reduce the maximum allowed U-Factor to .40. Additionally, language will be added to clarify that there is no prescriptive SHGC requirement in

Climate Zone 1, 3, 5, and 16.

Next slide, please.

In Table 150.1-A, we're proposing to make the following changes to the building envelope requirements. For high-performance attics, Option C, we're proposing to increase the prescriptive ceiling insulation standards to R38 in Climate Zones 8 through 10. For slab floors, we're proposing to correct the thermal conductivity units expressed by the requirement. Currently, the requirement is in terms of U-Factor. We're proposing to use F-factor, which is more accurate to use for slab floors. For fenestration, we're proposing to reduce the prescriptive maximum U-Factor to .27 in Climate Zone 1 through 5, 11 through 14, and 16.

Next slide.

This proposal will add a new prescriptive option to Table 1-A. Cathedral ceilings would be required to have a maximum U-Factor of .02 to .032, or a minimum R-value of 30 to 49, respectively. Depending on the Climate Zones, R 30 is proposed in Climate Zone 11, 14, and 16; R 38 in Climate Zones 1, 2, 4, 8 through 10, 12, 13, and 15; and R 49 in Climate Zone 3 and 5 through 7. In addition to these installation requirements, space, conditioning, equipment, and ducts would be required to meet Section 150.1(c)9B, which requires that the verified low-leakage ducts in

conditioned space conditions to be met as specified in Reference Appendix Section RA 3.1.4.3.8.

Next slide.

Okay. In Section 150.1(c)6, we're proposing a change to the space heating system type. Currently, in the 2022 Standards, we require a heat pump space heater in Climate Zones 3, 4, 13, and 14. For the 2025 Standards, we're proposing to require a heat pump space heater in all Climate Zones. Table 150.1-A will be modified to reflect this change. As a note, other system types can continue to use the performance compliance method.

Next slide.

In Section 150.1(c)8, we're proposing to remove exception one for gas instantaneous water heater in Climate Zones 3, 4, 13, and 14. Currently the 2022 Standards requires a heat pump water heater or solar water heating system with electric backup, with exceptions in Climate Zones 3, 4, 13, and 14. So, for 2025, by removing this exception, heat pump water heaters or solar water heating systems with electric backup will be prescriptively required in all Climate Zones. Similar to space heating, other system types can continue to be used under the performance compliance method.

The current Exception 2 will be renumbered to Exception 1. This is an exception intended for newly

constructed small dwelling units with a conditioned floor area of 500 square feet or less. We're proposing that we move the word instantaneous to make the exception more flexible so that all electric water heater with a point of use distribution can qualify for this exception.

Next slide.

In Section 150.1(c)7, we have updated the charge verification requirements. It is now dependent on whether the space conditioning system is a heat pump or air conditioner. For air conditioners, refrigerant charge verification is required in Climate Zones 2 and 8 through 15. For heat pumps, refrigerant charge verification is required for all Climate Zones. Additionally, we have removed the option to comply using the fault indicator display method.

Next slide.

In Section 150.1(c)15, ventilation system fault indicator display, FID, we added language to require all HRV ERV systems that serve individual dwelling units to have a fault indicator display and be verified as specified in Joint Appendix JA17. In Table 150.1-A, we added a role under HVAC system to specify that HRV ERV system shall meet requirements of 150.1(c)15.

Next slide.

Okay. Moving on to the single-family PV

requirements and 150.1(c)14. The current 2022 PV requirement is a formula that varies based on the conditioned floor area and the number of throw-in units. Under performance compliance, the PV size is based on the annual electrical load of a mixed-fuel building. And finally, the PV size can be reduced if the Solar Access Roof Area, or SARA, is limited.

Next slide.

For 2025, we're proposing to add a new term to the PV formula that is based on the EER2 of the installed HVAC system. To be clear, the PV size would remain the same when the EER2 is equal or greater than 11.7. This is being proposed as a reduction in minimum PV size that corresponds to the EER2 rating of the proposed space conditioning system. For Climate Zones where EER2 rating results in LSC savings, when compared to a minimum value of seven, the part of the equation in the red box will reduce the PV system size by full compliance. The reduction in size is capped at an EER of 11.7.

Next slide.

Under performance compliance, we're proposing to use the prescriptive PV formula to determine the standard design PV size. This is similar to how multifamily and non-res PV size is determined under performance. For buildings that have limited solar access, we're proposing a

minimum PV requirement that varies based on the pitch of the roof. For roofs with a pitch less than 2 to 12, or flat roofs, the minimum PV size is proposed to be determined by SARA times 14 watts per square feet. and for roofs with pitch greater than or equal to 2 12, the proposed PV size is SARA times 18 watts per square feet.

Next slide.

This is a sample table of the proposed PV requirement for a 27 square feet prototype with different EER2s. The most significant difference is in the hotter Climate Zones, such as Climate Zones 11, 13, and 15. For the milder Climate Zones, there is little to no effects to the PV size.

Next slide.

Moving on to the JA12, qualification requirements for battery energy source systems. Currently we don't have prescriptive requirements for battery in single-family, but it is available as a compliance option. And in order to qualify for the compliance credit, batteries needs to be certified to the CEC as JA2 compliant.

First, we added some new definitions in JA12. There's just a few I want to focus today. We introduced a definition of Battery Energy Storage Systems, or BESS. Currently in the standard, battery is being referred to both as a battery storage system and energy storage system.

This change will consolidate the definitions, and also align with energy terms and IECC definition for BESS.

Next, cycling capacity is the battery capacity in kilowatt-hour that is available for daily cycling, and compliant cycling capacity is the cycling capacity in kilowatt-hour that is programmed during installation, and would be subject to the new control requirements that will come out later on. Reserve level is the battery capacity that is not subject to the new control requirements, and available for other functions, such as home backup.

Next slide.

In JA12.3.1, we added reference of UL1741 Supplement SB to the safety requirements. This is in alignment with updates to the CPUC Electric Rule 21 for grid support inverters. In JA12.3.2, we moved the minimum 5-kilowatt hour capacity requirement from prescriptive compliance. We also updated the language for performance so that it's clear that the minimum 5-kilowatt requirement is per building, so that it can be met by having multiple batteries.

Next slide.

In JA12.3.3, we removed subsection (c) and (d), which currently deals with the battery backup behavior and twice-a-year reset requirement. Through stakeholder collaboration, Staff determined that this requirement

doesn't quite align with how batteries currently operate. Instead, we're introducing a new control requirement that's applicable to single-family only. If the cycling capacity of the battery drops below the compliance cycling capacity due to a change in the reserve level, after 72 hours the battery shall automatically reset the cycling capacity back to the compliance cycling capacity. This will ensure the battery will operate as a load-shifting device throughout its life. Any reserve level changes, weather, or PSPS events are not subject to this reset.

Working in conjunction with this new control requirement, we added a new Section JA12.5 for labeling that is, again, applicable to single-family only. The expectation is that the installer will program the battery with the compliance icon capacity, and then permanently attach a label to the battery.

Next slide.

We're proposing to remove JA12.6 because of potential redundancy and conflict with CPUC and publicly owned utility interconnection requirements. And so after renumbering the new JA12.6, we added reference to the new single-family labeling requirement -- so that the building inspector would be checking the label against the certification of installation. And JA12.7 is a new section that has a certification documents requirement. This is to

provide guidance for manufacturers for JA12 certifications, which, at the minimum, the manufacturer needs to submit the product spec sheets and any documentation on the control strategies and the 72-hour resets.

Next slide.

Okay. Now we want to provide update on the single-family performance path heat cooling energy calculations for climates zones 4 and 8 through 15. This topic will be covered in detail during the ACM reference manual workshops in the coming months. Peak cooling was introduced during the pre-rulemaking workshops and the pre-rulemaking slides, as well as updates on the current status now available on the 2025 rulemaking docket. While peak cooling was mentioned in the Draft 2025 Express Terms, staff proposed that this topic is more appropriate for the 2025 single-family residential ACM Reference Manual.

Through collaboration with stakeholders, including building industry and energy consultants, we developed new calculations for peak cooling energy in those specific Climate Zones, achieving 120 percent or less of the peak cooling energy of the 2025 single-family prototypes used in the compliance path, which will then be used to demonstrate compliance. This allows builders and design flexibility across a wide range of system types, including flexibility on decisions related to orientation,

fenestration, allocations, and varying construction practices.

Next slide.

Finally, we updated the research version of the 2025 CBECC with the new proposed Peak Cooling Energy Calculations. It is now available to download on our website.

Next slide.

MR. BOZORGCHAMI: Thank you, Danny.

MR. TAM: That concludes my presentation, and we're now open for questions.

MR. BOZORGCHAMI: Thank you, Danny.

Do we have any questions or comments in the room?

We've got one raised hand.

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

I just wanted to say on the battery -- the JA12 qualifications, we're supportive of the 72-hour reset. We think it will actually align well with the best economics for customers when using their battery. I appreciate that it still allows for you to install a five-kilowatt hour battery to comply with JA12. So we're excited about both of those provisions and the maintaining of the compliance credit for battery storage.

MR. TAM: Thank you.

MR. BOZORGCHAMI: Any more?

Thank you, Danny.

So I'm going to open it up for the people on the phone. Meg, go ahead and state your name and affiliation, please. You're muted -- oh, there you go.

MS. WALTNER: Yeah. Can you hear me?

MR. BOZORGCHAMI: Perfect.

MS. WALTNER: Hi, Meg Waltner, W-A-L-T-N-E-R Energy 350, supporting the Natural Resources Defense Council.

I just wanted to start by strongly supporting the expansion of the prescriptive heat pump baselines to space and water heating in all climate zones. We think these will set an important decarbonization signal for buildings, while, as it's been discussed, will still allow flexibility and fuel choice under the performance path, and so just really strongly supportive of staff's work to expand those baselines.

The other comment I had in this section, I was curious to learn more about the PV EER2 tradeoff. I'm wondering if there's any further documentation of how those numbers were developed. I haven't looked at the docket closely enough to see. You know, sort of at first reaction, I'm curious whether you've taken into account the difference in system lifespan between HVAC equipment and PV

systems, and also sort of the certainty of performance relative between those two systems in developing those numbers.

And then finally wanted to support your work on accounting for peak cooling. I think that is an important topic, and important to also allow some flexibility in how you do it. So I'm still sort of digesting what you've done there, but overall it seems like you've come up with a good approach on that.

Thanks. I think that's all I have in this section.

MR. BOZORGCHAMI: Thank you, Meg.

MR. TAM: Hi. This is Danny.

As far as the reduction in size, it's supposed to account for the LSC difference when you have a higher efficiency EER2, so that should correspond to whatever LSC savings you get as compared to a reduction in PV size.

As far as documentation, is it in the docketed report?

Yeah, so it should be in the docketed report.

MS. WALTNER: Okay. Danny, it sounds like you didn't do any accounting of the difference in lifetime between a PV system and an air conditioner in that accounting. Like, it's just a straight LSC difference in how they're modeled?

MR. TAM: Correct.

MS. WALTNER: Okay.

MR. BOZORGCHAMI: Thank you, Meg. Thank you, Danny.

Bob, I'm going to unmute you. Go ahead.

MR. RAYMER: Thank you. This is Bob Raymer, that's R-A-Y-M-E-R, with the California Building Industry Association and the California Apartment Association.

Just like to raise two points. First, we're very appreciative that the Commission is going to maintain some type of compliance benefit for storage. As we know, gas prices are going up, but so are electric prices. And we especially see a huge shift coming our way in the next three to four years, where, from a market standpoint, consumers more and more are going to be wanting storage on-site as a hedge against increased electrical rates. And I think you're going to find local government entities are going to like that, too.

Now, moving on to the peak load, like NRDC, CBI strongly supports the CEC's proposed modification. We've done some initial analysis, which we shared with the CEC. This change that you're making allows us to continue to focus on summer peak load items that really help reduce that. And now Javier, this morning, passed along the new CBECC version 9.9b. And COMSOL is going to go ahead, and

as always, as we've done for the last 20 years, we'll be doing some analysis using this latest computer program, and we'll be sharing all that with the CEC. But I have to say, right now, it's looking very good.

Thank you very much.

MR. BOZORGCHAMI: Thank you, Bob. Thank you for your support.

Next we've got Luke. Go ahead, Luke, state your name and affiliation, and spell your last name, please.

MR. MORTON: Yes. My name is Luke Morton, L-U-K-E M-O-R-T-O-N. And I'm calling from the CABEC Advocacy Committee, California Association of Building Energy Consultants.

And one kind of -- we are still reflecting on some of the new requirements, and largely supportive. The comment I have just specifically on the PV requirements and the year 2 is, some of the conversations we are having amongst ourselves is how to communicate those to -- and get those communicated in the project workflow. Essentially, what do you tell the -- we're, in our tasks, are trying to get the PV designers and installers retained early, earlier than possible -- as early as possible in the design process, to set that Code compliance element up for success. And adding these new elements with the steep slope and multipliers, but more importantly, the EER2

elements in that equation, make it just a little bit more to do that. Typically the PV subcontractors and designers, they have no idea what EER2 is. In the end, we can probably -- we'll end up sorting this stuff (audio cuts out) as we go into compliance modeling, and such. And give them more for numbers.

I think the recommendation I'd have, or one possible resolution, is just if there's finding a way to note reasonable values, or in the Residential Compliance Manual, I know I will be, and many of us will be, teaching about it as well to give those, the design community, default numbers. But just trying to think about how to help this Code do the work that it wants to do.

And that's it. Thank you.

MR. BOZORGCHAMI: Thank you, Luke.

Danny, do you want to respond?

MR. TAM: No. Just thank you for your comment.

One change that might make it easier for 2025 is that the standard design PV size is based on the formula. So, that should be, you know -- remain fixed, you know, no matter what type of project you have. So that could make things easier when you comply using performance.

MR. BOZORGCHAMI: Thank you, Danny.

Next, Brad. Go ahead and state your name and affiliation, and last name, please.

MR. HEAVNER: Good morning. It's Brad Heavner, H-E-A-V-N-E-R, Policy Director with the California Solar and Storage Association. I wanted to just thank the staff for all the hard work that's taken us to this point, and comment on the JA12 energy storage requirements.

The 72-hour reset, we believe, is a reasonable compromise on how to ensure that batteries do the cycling that they're expected to do. We believe there are just two additional elements that are needed on the operating conditions.

One is to target the timing of discharges in response to time-of-use rates. The way it's written, batteries may be forced to discharge in the middle of the day when rates are lower, which would be to the detriment of customers who could save that charge for TOU peak hours. And we would still get the same amount of cycling, and actually at a more beneficial timing, if they're allowed to wait until the high pricing. And there may be days when you really don't want them to discharge in the middle of the day. So we can clean that up.

The other one is in advance of extreme weather events that, you know, we will be doing daily cycling and solar-only charging for these batteries, but there should be a timeout allowed on that activity during announced severe weather advisories by the National Weather Service,

and public safety power shutoff events. This is allowed in other programs where we can pause our cycling in response to storm activity, and it should be allowed as well here.

We also have some concerns about the labeling requirements. I don't think we've had much discussion of that, and we will go back to staff with our issues there.

Thanks very much.

MR. BOZORGCHAMI: Thank you, Brad.

Brad, you have a lot of good comments there. Can I ask you to submit those in writing to us sooner than May 13th? Because we've got a team of staff working on that right now.

MR. HEAVNER: We absolutely will. Yes.

MR. BOZORGCHAMI: Thank you so much, sir.

Jonny, go ahead and state your name and affiliation, please.

MR. KOCHER: Hey there, Jonny Kocher, that's K-O-C-H-E-R, with Rocky Mountain Institute.

Wanted to, yeah, voice support for the two heat pump baseline for residential homes. We think this is a great step forward, and really want to cheer the CEC on for being a leader in decarbonization and new construction. I think this is a good example that other states should be looking towards as a way to promote electrification while still having the flexibility within federal law. And yeah,

great research and work on this. I look forward to working with the CEC moving forward to ensure this gets into the final Code.

Thank you.

MR. BOZORGCHAMI: Thank you, Johnny. Looking forward to working with you.

Andy, go ahead and state your name and affiliation, and please fill your last name for the record.

MR. SCHWARTZ: Yeah. Good morning. Andy Schwartz. Can you hear me okay?

MR. BOZORGCHAMI: Perfect.

MR. SCHWARTZ: Yeah, so yeah, my name is Andy Schwartz. A lot of people know me as S-C-H-W-A-R-T-Z. I'm speaking on behalf of Tesla this morning.

I just want to align our comments with those of CSSA. We agree with the statement that Brad shared earlier.

First, I want to thank CEC staff for the collaborative work they did on the JA12 reforms. In particular, we were really pleased to see the new framework with the designation of cycling capacity in the 72-hour reset which we think is a, you know, superior approach to ensure ongoing cycling of these systems to achieve the greenhouse gas and other emission goals that the CEC hopes to achieve by allowing storage to offset other building

performance requirements.

That said, we do have some lingering concerns about the specific control strategies that the cycling capacity is subject to. As currently drafted, while, you know, we certainly appreciate the intent of things like the basic control and time-use control, as written, they seem to, you know, we think, impose an overly restrictive kind of order of operation on systems. And you'll be able to recognize some of the contingencies that Brad mentioned, including, you know, customers may want to charge from both solar and storage to get their battery system in as high a state of charge as possible in advance of a potential outage.

So we will also plan on submitting, I think, some comments in advance of the May 13th deadline to suggest some amendments to the language to soften a bit, and in a manner that we think can preserve the intent to ensure cycling without unduly limiting the way customers use these systems. So I look forward to following up and working with all of you on potential future changes.

Thank you.

MR. BOZORGCHAMI: Thank you, Andy.

Andy, if possible also, could you submit your comment? I know you said earlier, but sooner the better on that one. This is a very delicate area that we want to

make sure we get right. So the sooner we get your comments, the better we are. And so is Brad's comments, that'd be great.

(Pause.)

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

MR. HERRSCHAFT: Hi. My name is Blake Herrschaft, H-E-R-R-S-C-H-A-F-T. I'm the Building Electrification Programs Manager for Peninsula Clean Energy, and have been a professional mechanical design engineer licensed in California for over a decade.

We want to commend the CEC on moving forward on decarbonization with the two heat pump baseline for new homes. This will drastically reduce greenhouse gas emissions of new homes, will future-proof our new housing stock, reduce local government staff time devoted to Reach Code adoption, and save Californians money. As a professional design engineer, I've successfully specified heat pumps for commercial and residential buildings in California since before the first iPhone was released. As a consultant and now programs manager for Peninsula Clean Energy, I've supported cities in all-electric Reach Code adoption for over two dozen jurisdictions.

We are ready. Our local building officials have shared that it is rare than an applicant for new

construction even considers gas anymore. Our realtors and builders note that the market has moved towards all-electric. We really want to thank the CEC staff and Commissioners for the changes made over the last two Code cycles, and the proposals presented here today.

Thank you so much.

MR. BOZORGCHAMI: Thank you, Blake. Thank you for that support.

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

MR. HURLEY: Yes. Thank you so much. Kurt Hurley. My affiliation is with the City of Berkeley. I'm the Green Building Sustainability Program Manager. Last name is spelled H-U-R-L-E-Y.

I'd like to echo many of the comments and the support on the compliance cycling capacity to be flexible in allowance with respect to the economic reciprocity of time-of-use rates.

I have another comment regarding the compliance cycling capacity, pertaining to BESS. And in general, just a reminder that as we look statewide at reliance on electric appliances that may have a 12 to 15-year lifetime, we do not forget that a building which intrinsically has the ability to perform the storage of heat energy, and then to redeploy it, may be of value. I have made a comment on

the California Energy Plan for 2024, and I think that same comment pertains here. So there might be an alternate compliance pathway where the internal wall assemblies have an increased thermal mass.

So currently, in the Table 150.1-A, we have a mass wall assembly, which is an exterior wall, at 7 BTU per foot per -- I'm sorry, per hour per square foot. But if we modeled 12 for interior walls only, the structure would have the ability to coast through. And so you might consider relaxing that compliance cycling capacity if the interior mass walls -- which, by the way, might have a lifetime of 70 years or 90 years, if it's wood frame construction, depending on the climate -- but achieves the same grid-friendly goals. So, you know, as we're pushing these appliances, the ability for them to interact, considering the systems impact, and the distribution, the transmission grid, and our overall State's energy system, we don't want to forget that if we build structures not only with ultra-efficient envelopes, but add to that approach increased thermal mass, we can reduce the engineering challenges and the interconnection challenges with the battery energy storage. And we might consider an alternate path here.

And I'll make this comment. I'm not opposed to the compliance cycling capacity. Of course, it's a

necessity. What I'm inviting us to do is sort of a yes-and paradigm, and not forgetting the opportunity to remind designers statewide that increasing thermal mass of buildings may have a comparable benefit.

Thank you.

COMMISSIONER MCALLISTER: Yeah. Can I ask a -- or make a quick comment there? Or ask a question?

I wanted to jump in. Thanks for that comment. Really excellent. And, you know, the Energy Commission has been funding for a number of years some research on related topics here, phase change materials and the like, that can be used in wall assemblies that really do provide thermal storage. Not thermal mass, but thermal storage.

And so are you thinking of any particular technology class, or just kind of general?

And then I wanted to ask staff sort of to detail sort of the performance path that that might have to follow.

MR. HURLEY: So thank you for the follow up question. As a mentor with the National Berkeley Labs Innovation Program, IMPEL, I'm agnostic to any material, because innovators and startups are coming up with ideas which need to be vetted all the time. And we know of phase change materials and using those in interior wall assemblies in a way that doesn't interfere with the

structural load bearing design requirements for wall assemblies. And well, in my earlier comment, I suggested up to 67 percent of the interior wall assemblies, maybe you do this 12 BTU per hour per square foot.

So to answer your first, you know, agnostic to materials. I'm not aware of the material, and as a government employee, obviously I can't endorse any one particular approach, but I have to provide examples. Did I -- and then I'm sorry, did I answer your -- you had a second part of your question. Did I cover that?

COMMISSIONER MCALLISTER: You know, my second part was more for staff to just describe the performance path for incorporating measures like that, so that people could actually go to the performance path and incorporate those into their design.

MR. BOZORGCHAMI: So currently in the computer software that we use for evaluating these measures and proposals, there is a built-in minimum thermal mass assumption. I believe it's -- oh, okay -- between 20 percent and 30 percent of the buildings considered to have thermal mass. In the past CODE cycles, we used to have that available, where a designer or energy consultant could model where thermal mass is located regarding -- or based on the unit interior mass capacity.

But now -- and I apologize for saying this -- but

in the past we've noticed that there was a lot of gaming happening with that. So what we decided to do earlier on in the early 2000s was to build that into the program, so assumption that there's a 20 percent built-in requirement for a thermal mass.

Now, within the compliance assembly within the program, depending on how you -- whether you assume a CMU wall, metal framing, or wood framing, that thermal mass is captured internally within the program. And that's what was used for evaluating what we did with mechanical systems and others. Single-family homes, we assume a wood framing system with your standard 20 percent, assuming that there's carpet, hardwood floor, entries, and whatever so forth is your flooring for kitchens and bathrooms.

The Energy Commission, we understand through our research programs that there are other phase change materials coming in, there's more efficient fenestrations in the works right now. We're looking at IGUs. We're looking at, as Kurt said, phase change materials. And as that does come about, and is more available, and more readily available in the marketplace, that it shows reliability and construction practice, we will be able to integrate that into CBECC software. And CBECC software being a more exquisite program, it's easily captured.

COMMISSIONER MCALLISTER: Alright. Thanks.

MR. HURLEY: Thank you. That was valuable, understanding the history. And thank you, I'll submit the comment in writing. Again, it is redundant to a comment that I already made on the State Energy Action Plan.

The gaming in the past, that's, you know -- potentially, in a current situation, if there were three or four common, accepted higher thermal storage-capable interior wall assemblies, and you could choose from a drop down menu, and then the plans had to demonstrate, oh, this is interior thermal storage assembly three, you know, show that on your elevations or your floor plan -- but maybe that's pushing a little bit far. But there's always a middle ground to make something work with the deck of cards that we have currently. And I understand that we have emerging materials, we have the past issue, which I wasn't aware of, you know, of flexibility in the software that was not -- was, you know, misutilized.

But thank you. Thank you, and I'll leave my time for other comments, for other people's comments.

Thank you.

MR. BOZORGCHAMI: Thank you, Kurt.

Kurt, let's you and I touch bases. There are mechanisms to get these new systems into the CBECC software. We don't have to wait for the three-year Code cycle, but these systems have to show validity.

MR. HURLEY: Got it.

MR. BOZORGCHAMI: But we're more than happy to work with you. We do have a program that does that.

MR. HURLEY: Yeah, yeah, modeling is what I -- we need to do a modeling first.

Thank you.

MR. BOZORGCHAMI: Okay. Well, we'll get together, Kurt.

Next, Marina. I'm sorry, I think I accidentally lowered your hand earlier. I apologize. But go ahead and state your name and affiliation.

MS. BLANCO: Hi, can you guys hear me this time around?

MR. BOZORGCHAMI: Perfect. Thank you.

MS. BLANCO: Great. Hi, my name is Marina Blanco, B-L-A-N-C-O, with Gabel Energy.

And thank you guys for all the work on this prescriptive single-family. There's some great adds to it that I'm really enjoying, especially this exception, new dwelling units with a conditioned floor area of 500 square feet or less with the fenestration. It's Exception 1 to Section 150.1(c)3A.

This is in Section 150.1 for new construction. I just wanted to verify that the addition and alteration sections are written in such a way that, would this

exception also apply to new dwelling units that are considered an addition, new ADUs that are considered additions to a home, or an alteration to a home also meet this exception? Or is this limited only to new construction dwelling units at this time?

MR. BOZORGCHAMI: I think you're jumping the gun a little bit here, Marina. If you wait until after the break, Bach Tsan is going to be talking about the additions and alterations for single-family.

MS. BLANCO: Okay.

MR. BOZORGCHAMI: And we can answer that question during that time if that's possible.

MS. BLANCO: Absolutely.

MR. BOZORGCHAMI: Thank you.

And I promise, I will have you raise your hand, and I will respond. Sorry about that earlier.

Luke, go ahead.

Oh. Luke dropped his hand too. So it's back up. There we go.

Luke, go ahead and state your name and affiliation.

MR. MORTON: Yeah. Hi, this is Luke Morton, L-U-K-E M-O-R-T-O-N, calling from the CABEC Advocacy Committee.

Just wanted to chime in for 20 seconds to reflect on, I was provoked or inspired by Kurt's comments on -- and

just wanted to bring this up as a placeholder for future stuff -- in terms of that, and thinking about how our Building Standards are going to be more interactive with the distributed energy system in our grid, which I think there's -- you know, the IEPR is kind of the direction we're going. But to encourage the Commission, you know, as it's already doing, looking at PCMs and other kinds of storage technologies, to maybe open up some of those opportunities to figure out how, and not if, to get maybe past, say, you know, things like thermal mass enabled again. But to do it in a way that addresses past concerns. But to essentially help resolve our future, our present and future problems in our energy transition.

That's it. Just wanted to lay that out there for future Code cycles.

MR. BOZORGCHAMI: Thank you, Luke.

I do want, if it's possible, to have you docket that comment to our site. It's very important for us to work on those.

MR. MORTON: I'll be happy to do so. And actually, I think it'll be lots of hopefully more specific thoughts and comments. And really just thinking ahead and being a part of this dialogue, of not just you guys trying to think about this, but really a collaboration of, you know, where we should be going here.

Great. Thank you.

MR. BOZORGCHAMI: Thank you.

I don't have any more raised hands. I don't see anyone raising their hand here in the room.

So Mikey, we have two comments.

MR. SHEWMAKER: Yeah, we have two questions from Mazi Sharaf. The first question is, why is Climate Zone 15 excluded from the window U-Factor 0.27 requirement?

And a follow-up question to that is, is this an artifact of LSC ladder summer peaks?

Thank you, Mazi, for the comment. Just so I'm not responding off-the-cuff, I'd like to review that report first, but we will respond following today's presentation, and we will get a response with it.

And no further questions.

MR. BOZORGCHAMI: So folks, put the screen back up. This is my favorite slide of all day, pretty much. Submit your comments before May 13th, please. Sooner, the better. And the link to the doc is right there. Looking forward to seeing all these comments.

With that, we're going to take a quick 15-minute break. And when we come back, Bach Tsan, our Senior Mechanical Engineer, is going to present on the single-family residential additions and alterations. Thank you.

We'll be back around 11:10. Thank you.

(Hearing went to break at 10:53 a.m., returning at 11:09 a.m.)

MR. BOZORGCHAMI: Alright. Thank you, everyone. We're going to resume with Bach Tsan presenting on Section 150.2, the additions and alterations for single-family homes.

With that, here we go.

MR. TSAN: Alright. Well, good morning, everyone. My name is Bach Tsan. I am the Senior Mechanical Engineer with the Building Standards Branch at the California Energy Commission.

Today I'll discuss or, you know, walk through the proposed changes for Section 150.2 of the Standards concerning additions and alterations.

Slide, please.

So let's begin with the revisions to 150.2(a), which now prioritizes heat pumps for new or replacement space heating systems in additions. So to accommodate this, Section 150.2(a) Exception 7 has been removed or deleted to align with the heat pump baseline. It changed from the 2020 Code, which allowed for either a heat pump or gas heating system for new or replacement space heating system serving an addition. This prescribes heat pumps for new replacement heating systems serving additions. It aligns the additions with newly constructed buildings, and

prior -- or newly constructed buildings. However, the CEC staff is considering exceptions for certain challenging scenarios such as colder Climate Zones, and locations with electrical infrastructure constraints.

Next slide please.

So in Section 150.2(a)1E we're proposing addition -- adding requirements for additions that set maximum capacity limits for space conditioning systems, and establish limits for envelope leakage assumptions used during system sizing. The maximum capacity limits depend on calculated heating design load, calculated cooling design load, and space conditioning system type.

Oh, sorry, give me -- alright.

Next slide, please.

So, to continue in 150.2(a)1E for space conditioning capacity limits, this states that there's no maximum capacity limits when the airflow is verified to be at least 350 CFM per ton. When the airflow isn't verified to be at least 350 CFM per ton, space conditioning systems must allow -- must follow maximum capacity limits set in Table 150.2-A for heating and Table 150.2-B for cooling.

Next slide, please.

Alright. Well, this slide shows Table 150.2-A. This is the maximum heating capacity. The table shows the maximum capacity is dependent on the system type, the

calculated design load, and the calculated cooling load design.

Next slide, please.

And this slide shows the Table 150.2-B for maximum cooling capacity. Again, the table shows the maximum heating -- maximum capacity is dependent on the system type, the calculated design load, and the cooling load.

Okay. Next slide, please.

So, continuing on in Section 150.2(a)1E, we are also proposing adding requirements for additions that establish limits for the envelope leakage assumptions used during the system sizing, unless the envelope leakage has been established through field verification and diagnostic testing. And so Table 150.2-C here shows the maximum envelope leakage values used in load calculations for space conditioning systems, and that have not been established through field verification. The leakage value is depending on the building type and condition floor area. And then 150.2(a)2D as -- just states, all requirements in Section 150.2(a)1E also apply to additions using the performance approach in Section 150.2(a)2B.

Slide, please.

So this one -- so, similarly in Section 150.2(b)1A, we add an exception that would allow for

prescriptive alterations to comply with the maximum so solar heat gain coefficient value of 0.23 when adding vertical fenestration in Climate Zone 15. It's noted -- it should be noted that this exception would replace the previous Exception 1 in Section 150.2(b)1A. And Exception 2 would be modified to include a vertical fenestration, as well as remove the relaxed U-Factor in SHGC standards.

Starting in 2026, prescriptive alterations that add vertical fenestration will be required to meet the U-Factor and SHGC requirement of Section 150.1(c)3A and Table 150.1-A. You know, i.e. for similar for the new construction.

Alright. So -- sorry -- 150.2(a)1E pertains to the space conditioning load calculations and system capacity for building conditions. It defines some minimum capacity requirements that are detailed in 150.0(h)5. Additionally, it introduces the maximum capacity limits for space conditioning systems, with these limits depending on several factors: the calculated heating design load, the calculated cooling load, the cooling design load, the specific type of space conditioning system implemented, and the sizing dimensions of the ductwork. This section is also responsible for establishing envelope leakage assumptions, specifically in cases where assumptions have not yet been confirmed by the verification and testing

procedures.

Alright. Next slide.

We'll look at additions related to requirements for water heating. So Slide 14, this slide shows a comparison between the existing 2022 Standards and the proposed 2025 Standards for Section 120.2(a)1D regarding water heaters in building additions. Under the 2022 Standards, the word "second" water heater was used, while for 2025 Standards where the language will refer to any additional water heaters, and not just the second. And so in 2022, the prescriptive water heater option includes water heater -- heat pump water heaters, gas or propane instantaneous water heaters, or an instantaneous electric water heater for small additions, in any system using no more than the energy specified. So for 2025, the 2025 Standard is removing the option for gas instantaneous water heaters. The removal of this option also leads to renumbering of subsequent Sections. The proposed changes aim to align the requirements for water heat additions for those for the newly constructed buildings.

Next slide, please.

So this is for envelopes.

Continue on.

So in Section 150.2(a)1 for additions, we plan to add an exception for prescriptive additions that add

vertical fenestration to Climate Zone 15. This exception would allow -- there's an exception here that allows for projects to comply with the maximum SHGC 0.23 in Climate Zone 15.

Next slide, please.

So in Section 150.2(b)1B, we also plan to modify the exception Two to the Prescriptive Alterations Replacement Penetration Standard. Starting in 2026, replaced skylights will need to meet the U-Factor or no greater than .4, and an SHGC of no greater than .3. And like we did for additions and alterations where fenestration is added, we have an exception for Climate Zone 15, which would allow replaceable fenestration to comply with maximum SHGC value of .23.

Slide, please.

So for ceilings and attics, in Section 150.2(b)1Jiv, we intend to modify the existing language to clarify that it is Section 806 of the California Residential Code, Title 24, Part 2.5, that is being referenced.

Next slide.

In Table 150.2(g), we're proposing to make the following edits to the performance standard design for altered component table. In the fenestration, the modification is so that the standard design without third-

party verification of existing conditions be based on the prescriptive standards found in Section 150.1(c)3A, and if the third-party verification is performed, the standard design would be based on existing fenestration U-Factor and SHGC values certified by the ECC-Rater.

And for window films, we plan to modify the table so that, again, the standard without the third-party verification be based on the prescriptive standards found in Section 150.1(c)3A.

Next slide, please.

Alright. So we'll talk about this requirement that was moved to Part 11. So we made a change from the pre-rulemaking language in relation to single-family A/C to heat pump.

Next slide, please.

So our pre-rulemaking proposal was to mandate the replacement of standard air conditioners with heat pumps in existing single-family homes. There was a pathway in the proposal to allow for continued use of standard air conditioners to pair it with additional emergency measures. However, the proposal has been shifted to Part 11 as a voluntary measure. The considerations we faced were it placed costs on residents rather than builders and developers. This also moves as a measure to align with the anticipated surge in public subsidies to support heat pump

installations. The proposal grants the industry professionals time to familiarize themselves with heat pumps, and initiates partnerships with heat pump manufacturers to facilitate the transition. It also serves as a framework for local governments to pave the way for better adoption.

So that is the -- that should be --

MR. BOZORGCHAMI: That's the end.

MR. TSAN: -- the end.

MR. BOZORGCHAMI: Thank you, Bach.

Before we go to folks on the line, is there any questions or comments here in person?

Good. We're going to go -- okay, we're going to go to the line.

And the first person, Brian Selby, go ahead and state your name and affiliation.

MR. SELBY: Hello. This is Brian Selby from Selby Energy Inc., also board president of CABEC, California Association of Building Energy Consultants. Last name is Selby, S-E-L-B-Y.

Thanks again to the Energy Commission and all the case authors who put in the time to clarify the additions and alterations sections of the Residential Single-family Code. One thing that I thought was important, since the prescriptive requirements now no longer requires or allows

a gas water heater, there -- Section 150.0(n), electric ready requirements for water heaters requiring the infrastructure for the future installation of heat pump water heater, applies to additions when a water heater is added to serve an addition. I think it would be particularly helpful to add some language in Section 150.2(a)2 under the performance standards indicating this, that when a gas water heater is added to serve an addition, it must also meet the requirements of Section 150.0(n). There's a lot of confusion within the industry in this area among building departments, plans examiners, building inspectors, as well as energy consultants, and this language would be particularly helpful to clarify, now that some of the language regarding water heaters have changed.

That's it, thank you.

MR. BOZORGCHAMI: Brian, I'm going to have you work with Danny Tam, our water heating expert. He stepped away for a minute, so I prefer you and him directly, and do a proper job of developing language for that.

MR. SELBY: Awesome. Be happy to.

MR. BOZORGCHAMI: Thank you, sir.

Next we have Blake. Go ahead, state your name and affiliation and spell your last name for the record, please. Yes, thank you so much for the opportunity to comment.

MR. HERRSCHAFT: My name is Blake Herrschaft. That is spelled H-E-R-R-S-C-H-A-F-T. I'm the Building Electrification Programs Manager for Peninsula Clean Energy, a professional mechanical design engineer licensed in the state of California for over a decade.

We want to commend the Energy Commission staff for removing the instantaneous gas water heater option for additions. These are very difficult to electrify once they're installed, require significant gas demand, and do not function during power outages due to the electricity requirements on the controls and their lack of storage. They're also dangerous.

We agree with the CABEC comment regarding clarification on pre-wiring for additions. This can be a little confusing, but it is an important requirement.

With regards to existing residential HVAC systems, we recommend the Commission prescriptively require heat pump capability for new or replacement A/C systems now. We kindly ask that the state of California take the lead on building decarbonization. California currently has far and away the highest saturation of gas-fired residential equipment of any state in the United States, possibly on planet Earth. If the state is willing to take the lead on this requirement, it will drastically reduce the amount of effort our boards and city councils will need

to spend on Reach Codes.

This takes a lot of effort. I've been to over 100 council meetings related to Reach Codes and expect to attend dozens more if this measure is kicked down the road to the end of the decade. These cost city staff time, council time, and endless resources.

Two of our member agencies have already created these requirements years ago, and are successfully implementing. Those are Portola Valley and the city of San Mateo. In the interim between the 2025 Code cycle and the next one, well over a million air conditioners will be installed in California homes without heat pump capability, stranding fossil fuel equipment in these homes into the 2040s. We kindly request the CEC consider creating this prescriptive requirement today.

Thank you.

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

Next we'll go to Meg. Go ahead, Meg. State your name and affiliation, please.

MS. WALTNER: Great. Hi. Meg Waltner, W-A-L-T-N-E-R, Energy 350, speaking on behalf of the Natural Resources Defense Council. Yeah, thank you very much for the opportunity to speak today.

I wanted to start by supporting the prescriptive

requirements for heat pumps and additions, as well as for heat pump water heaters, new additional heat pump water heaters serving additions. Those both will harness a key opportunity to install heat pumps in those new spaces.

You know, following on the comments from Blake, we were disappointed to see A/C to heat pump replacement provision move to Part 11. We think this misses a major opportunity to upgrade existing A/C systems to heat pumps at the time of equipment replacement, and urge you to reconsider the decision to put that in Part 11 versus Part 6.

In particular, really urge you to reconsider it for the circumstance of major alterations. These alterations where you're replacing the whole system, including the ductwork and the equipment, where it's really a key opportunity to encourage the installation of a heat pump instead of that one-way A/C system and really a small incremental upgrade compared to that whole project scope and cost. And so, you know, we've obviously commented on this issue a lot and appreciate all of staff and everyone's hard work to date, but yes, we would like to urge you to reconsider that part of this proposal.

Thank you very much, and, yeah, I appreciate all the hard work on this.

MR. BOZORGCHAMI: Meg, thank you for your

comment. Bob is taking notes. Thank you.

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

MR. KOCHER: Thank you. Jonny Kocher here, that's K-O-C-H-E-R, with RMI.

Yeah. Largely would like to echo comments from both Blake and Meg. Do want to, you know, reiterate the positive comments I've said on the new construction, single-family baseline and nonresidential for HVAC equipment, as well as the A/C to heat pump replacement for existing commercial buildings.

However, I am disappointed that the CEC is moving the A/C to heat pump requirement from Part 6 to Part 11 from the pre-rulemaking draft. You know, in order to hit the 2030 heat pump goals, it's going to be pretty difficult to do that if we're not going to be replacing every system opportunity as they come up. When central air conditioners, you know, break down, this is a very cost-effective opportunity for folks to actually be switching over to heat pump, and, you know, especially here in California with milder climates. When looking at the IRA tax credits, it's pretty clear that the upfront cost of a minimum efficiency air conditioner compared to a 45(c) tax credit eligible heat pump is actually, you know, about equal. So I think that's something to look into a little

bit more.

And also wanted to, you know, around operating costs with the most recent proposal through on CARE-rate customers being able to get lower fixed charge costs, I think that the electric rate concern around increased electrical rates for low-income folks is no longer a concern, which I know is something that the CEC staff was concerned about when first looking at the A/C to heat pump requirement.

I would encourage the CEC staff to reconsider between the 45-day language. And I would also like to, at least for these opportunities where the whole system replacement, including duct work, is happening, I agree with Meg that this is a very low-hanging fruit. and I think the incremental cost is more than worth the benefit of electrifying that whole system.

Thank you.

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

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

MS. BLANCO: Hi. My name's Marina Blanco, B-L-A-N-C-O. I'm with Gabel Energy, and I'm just going back to the comment that I had in the last section.

There was a lovely exception in Section 150.1

for, in the new construction section, when there are new dwelling units and the ease on U-Factor in certain climate zones for fenestration. I just wanted to make sure that new dwelling units that are considered additions, and alterations as well, are given that exception or -- as it is not explicitly written into those sections. Or are the additions and alterations sections written in such a way that that exception could also be applicable to new ADUs that are considered additions?

MR. BOZORGCHAMI: I'm going to take this one real quick, Marina. I think you and I need to discuss this separately.

I think what I need to do is work on the language, make it a little bit more clear. But the intention was not to provide a confusion there. So let me work with you on that. We'll get the language right.

MS. BLANCO: Great. Thank you so much.

MR. BOZORGCHAMI: You're welcome. If not me, Mikey Shewmaker would be more than happy to also.

MS. BLANCO: Thank you.

MR. BOZORGCHAMI: Anybody else would like to make a comment?

If not, we're going to go to the Q&A. I don't think we're going to have time before lunch to hear Anushka's presentation, so we'll probably take a lunch

break.

But Mikey, for now?

MR. SHEWMAKER: Yeah. We have one open question from Derek Daniels: can somebody replace their existing gas water heater like for like, or do they need to upgrade to heat pump water heater?

MR. TAM: Danny Tam, CEC staff. Yes. If your existing water hear is gas, you can replace it with gas. Yes.

MR. SHEWMAKER: Thank you. No further questions.

MR. BOZORGCHAMI: I'm going to come back to the folks in the room.

Raised hands? Comments, questions? Jon, nothing? So we'll go to the attendees.

I don't see any more raised hands.

So with that, let's take a lunch break. How about let's reconvene about 12:40, if that's okay? I don't see any objections, so, Commissioner, if it's okay, we'll reconvene at -- let's make it 12:45, then, for --

COMMISSIONER MCALLISTER: Okay.

MR. BOZORGCHAMI: Okay. So we'll reconvene at 12:45.

Thank you.

(Hearing went to lunch break at 11:34 a.m., returning at 12:45 p.m.)

MR. BOZORGCHAMI: Okay everyone, we're back from lunch. I hope everybody had a nice hour break. We're going to reconvene, and we're going to resume our hearing.

We're going to be hearing Anushka Raut, our air pollution specialist, who will be presenting on the multifamily mandatory measures. This is Section 160 of the energy standards.

Anushka?

MS. RAUT: Thank you, Payam.

Good afternoon, everyone. Thank you for taking the time and joining in today. My name is Anushka Raut. I am an Air Pollution Specialist staff in the Standards Development Unit, and I shall be leading this presentation today on the proposed changes to the Section 160.0 to 160.9 on multifamily mandatory measures.

Next slide, please.

So to begin with, in Section 160.1(b) for mandatory wall insulation and building envelope requirements, we are proposing to reduce the mandatory maximum wall insulation U-Factor requirement. These changes would include for metal framing, the overall assembly should not have a U-Factor exceeding a U-Factor of .148. For two by four framing, the overall assembly should not have a U-Factor exceeding a U-Factor of .095, which is equivalent to R-15 cavity insulation in a two by four wood

frame assembly. For two by six or greater framing, the overall assembly should not have a U-Factor exceeding a U-Factor of .069, which is equivalent to R-21 cavity insulation in a 2 by 6 wood frame assembly

Next slide, please.

Next, there has been an addition of Section 160.1(g) for building envelope requirements on slab edge insulation. That includes mandatory insulation criteria to identify minimum insulation criteria when slab edge insulation is installed. This language is new to the multifamily section for the 2025 Cycle, but the requirements are identical to those already applicable to the single-family buildings, and found in Section 150.0(f) of the Energy Code. The minimum specifications that are added in this section include water absorption rate, water vapor permeance, physical and UV damage protection requirements, and a reference to the heated slab insulation requirements of Section 110.8(g) to ensure consistency across both sections.

Next slide, please. Okay.

Further, in Section 160.2, mandatory requirements for ventilation and indoor air quality, or IQ, we revised the language in subsection 160.2(b)2Aivb, whole-dwelling unit mechanical ventilation requirements. These changes include new construction multifamily dwelling units shall

have balanced or supply-only ventilation as the whole-dwelling unit ventilation mechanic currently used as strategy, and the compartmentalization at the maximum level of .3 CFM at 50 pascals per square foot of dwelling unit enclosure area.

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In subsection 160.2(b)2Avi, mandatory requirements for balanced and supply ventilation component accessibility for dwelling units, there has been an addition of two subsections, 160.2(b)Axia and subsection 160.2(b)2Axib. In subsection 160.2(b)Axia, IQ filter and heat energy recovery ventilation system, or HRV/ERV accessibility, we added language for accessibility requirements for IQ system components such as filters and heat and/or energy recovery codes for replacement and maintenance. Additionally, we added an exception to subsection 160.2(b)Axie, to help specify accessibility requirements for systems that require servicing from the inside of an attic. In subsection 160.2(b)2Axib, IQ system component accessibility, we added language to include other IQ system components, including fans, motors, heat exchangers, and other serviceable components to be included to be required to meet the applicable requirements of the California mechanical Code 304.0.

Next slide, please.

Next in Section 160.2(c)2, mandatory requirements for natural ventilation in common use areas, there are no changes to the natural ventilation requirements, but we have made changes -- we have made some changes to update the ASHRAE references, similarly used in ASHRAE 62.1-2022, and moved some of the requirements around to make them more explicit, such as mechanical ventilation requirements.

Next slide, please.

In Section 160.2(c)3, mandatory requirements for mechanical ventilation in common use areas, mechanical ventilation requirements are not changing, but we are changing the language to be more clear by implementing the Area versus Person Ventilation Rate. Further on in Table 160.2-B, we have made changes to the table to include the Area-based Rates and Occupant Load Densities for Area versus Person method. These values were back-calculated from 2016 ventilation tables, and should not change the ventilation rates.

Next slide, please.

In Section 160.2(c)5E, Occupied - Standby Zone Controls, occupant zone controls have been rewritten to make the requirements clearer to understand. The next change is we are moving Table 160.2-A as this table is not used in multifamily sections, and was just copied over during the migration of the multifamily Sections during the

last Code cycle. We further updated the Table 160.2-D to include one new air stream source, source rate, and we revised this table to be in line with the reference -- to be in line with the references of ASHRASE 62.1 table of the 2022 year version.

Next slide, please.

In Section 160.4, mandatory requirements for water heating systems units, the heat pump water heater ready requirement in Section 160.4(e) has been moved to Section 160.9(e) with the other electric ready requirements. This reorganization was done for clarity. In Section 160.4(e)1, after the renumbering, the mandatory pipe insulation requirements now include a comprehensive list of piping components that requires pipe insulation. These changes provide clarity to the design and the insulation industry to ensure uniform pipe insulation of the heating plant, recirculation loop, and branches to the dwelling units.

In Section 160.4(e)2, we added alternative pipe insulation thickness requirements for conductivity outside the range of Table 160.4-A. This is done to match the similar requirements in Section 120.3.

Next slide, please.

So continuing with the mandatory requirements for heating systems and units, exception to Section 160.4(f)1

has been deleted because pipe insulation requirements for space conditioning is currently covered under Section 160.3(c)1, and this exception is redundant. We added reference to pipe appurtenance in Section 160.4(e)3 to clarify that insulation protection is also applicable to piping appurtenance.

In Section 160.4(e)4, we added a new mandatory requirement for field verification of insulation quality. This is accompanied by a new referenced section, RA3.6.3, that specifies the field verification process -- procedure, sorry.

Next slide, please.

In Section 160.9, which is the mandatory requirement for electric ready requirements in buildings, we added a new Section, 160.9(a), that includes general requirements applicable to all electric ready requirements. This new requirement ensures buildings' electrical systems have sufficient capacity. Subsequent sections in Section 160.9 have been renumbered.

In Section 160.9(d)2A, the sizing requirements for clothes dryer has been removed because the new Section 160.9(a) already covers the requirement.

Next slide, please.

In Section 160.9(e), these are the requirements that were moved from Section 160.4. Additionally, there

are new ventilation and designated space requirement for future location of heat pump water heater. The conductor size requirement has also been changed from 10 wire gates to a rated 30 amps minimum.

Continuing with the mandatory requirements for electric ready buildings, we added a new Section 160.9(f) for central heat pump water heater ready. These requirements ensure the building is prepared for future installation of central heat pump water heaters. This includes spaces that are reserved for the heat pump, storage tank, condensate drain, and the electric bus.

Next slide, please.

To support the new central heat pump water heater ready requirement, we added a new Koint Appendix, JA15, which describes the qualification requirements for central heat pump water heater ready in more detail.

And with this slide, I conclude my presentation. Thank you for listening and feel free to chime in for questions or comments.

MR. BOZORGCHAMI: Thank you, Anushka.

Any comments in the room? Raise your hand.

We'll go to the phones right now.

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

And you need to unmute yourself from your end.

MS. BRAGG: Hi. I'm sorry. That was a mistake. I did not mean to raise my hand.

Thank you.

MR. BOZORGCHAMI: No worries. Thank you. No worries. We do it all the time.

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

MR. SELBY: Thank you. Brian Selby from Selby Energy, Inc., and the California Association of Building Energy Consultants. Last name is Selby, S-E-L-B-Y.

I just want to thank the Commission and the multifamily restructuring case team for the cleanup to the multifamily section of the Code. By and large, I agree with most of the additions to this section. There were a couple that were concerning to me. Section 160.1(b)2, metal frame walls shall not exceed a .148 U-Factor.

This particular measure, if you were to go to table JA4.3.4 -- or 4.3.3, regardless --there are no metal wall framing assemblies that meet that .048 U-Factor without adding rigid continuous insulation. This is a particular concern. In many cases, those mandatory requirements are not governed by the performance approach, meaning that somebody could demonstrate compliance without meeting the mandatory requirements, and it's often not

caught by the plans examiner or the building inspector, losing out on the savings there. And we completely understand that those savings are important on especially on metal frame walls, but having a requirement that only requires rigid insulation or compliance on metal framing for multifamily creates a confusion in the industry, especially when you're dealing with a mixed use building.

Of particular concern, this requirement also applies to additions. And although there are allowances for wood frame construction to extend an existing wood frame wall to match the same thickness of the existing wall, there are no provisions in the additions Section 180.1(a)1A, that allows the same consideration for extending a metal frame wall. We think this is of particular importance for additions.

Go ahead.

MR. BOZORGCHAMI: Brian, I'm going to have to stop you here and have you maybe submit your comments as a docket. But let me -- in general, provisions in the mandatory requirement for metal framing is based on a U-Factor. And with U-Factor, one of the options is to do the continuous insulation. There are other ways you could do that. We could do it with a high-density spray foam. You could do it -- actually, you could do a double wall system. And I see what you're saying. Let me --

MR. SELBY: In an addition scenario, when the project design does not allow for that additional thickness or offset of the exterior or interior surface, I think it's a particular concern, and unlikely to get caught during a plan check or building inspection. I think that there's, you know, some room for some allowance in this area. I completely understand that those metal frame walls are much worse than a wood frame wall, but this has a high potential for complaints.

MR. BOZORGCHAMI: I understand.

One of the issues is that the multifamily we're going into, as we're more and more getting into the multifamily industry of construction, we're going to see a lot more metal framing and, you all know, metal is a conductor, and --

MR. SELBY: Understood.

MR. BOZORGCHAMI: -- as much insulation as you put in the cavity, it really doesn't affect the conduction through that metal, so we have to somehow block that -- we have to break that bridge somehow. This was -- the intent was to do that with the continuous insulation.

MR. SELBY: Yeah. Understood. Understood.

Because it only applies to multifamily, and not also non-res, it just makes it confusing for the industry, as well as having those situations where you have a

mismatch in the wall thickness. You know, at the very least an exception very similar to those in the -- for wood frame construction. So I think this has a high probability of non-compliance, and rather than having none of the walls meet this U-Factor, at least give consideration for at least a wall extension not to be required to meet this, and then the rest of the walls will. So --

MR. BOZORGCHAMI: Okay.

MR. SELBY: -- of concern.

MR. BOZORGCHAMI: We'll look into -- I'll look into that.

MR. SELBY: Okay. I did have one more item. I'll raise my hand again when there's --

MR. BOZORGCHAMI: Actually, go ahead and -- what is the other item?

MR. SELBY: The other item is the verified pipe insulation, 160.4(e)4, requiring pipe insulation to be HERS-verified. To date, there is no precedence of that being a mandatory requirement. I think this is of particular concern when this measure -- or the inspection by the third-party verifier isn't called. This project, you know, closed, trying to get a permit, and there are no provisions for this verification to be made after the fact. This happens quite often, and I think that requiring the pipe insulation to be HERS-verified is a bit far-reaching

and optimistic to execute consistently in the field.

MR. BOZORGCHAMI: Okay. Thank you, Brian.

Could you put those in writing and submit it to us, so we'll (indiscernible) list?

MR. SELBY: Yep. I'd be happy to.

MR. BOZORGCHAMI: And the sooner the better, so we can get an eye on it. Thank you.

MR. SELBY: You're welcome. Thank you.

MR. BOZORGCHAMI: Next, Carol. Go ahead and state your name and affiliation, please.

MS. ROBERTS: Hi. Carol Roberts, g.r.e.g. Consulting. It's R-O-B-E-R-T-S.

Brian, to two of your points, for 160.1, the .148 metal frame wall, U-Factor mandatory minimum. It's difficult. The best thing we've come as close to that in assembly values is two layers of 5.8 drywall on the inside. R-21 in the, it has to be five-and-a-half-inch frame metal wall, and one inch of dense glass, and seven-eighths inch styrofoam.

MR. BOZORGCHAMI: Carol, I apologize. Can you speak up a little bit?

MS. ROBERTS: Oh, sure. Sorry.

MR. BOZORGCHAMI: We're having a hard time.

MS. ROBERTS: Can you hear me now? Can you hear me any better now?

MR. BOZORGCHAMI: Yeah. Thank you.

MS. ROBERTS: Okay. Sorry.

In order to hit a .147, we have to have two layers of five-eighths drywall on the interior -- which would be a 2-R fire, you know, assembly -- R-21 bat insulation, one inch of dense glass or similar product, and seven-eighths inch of stucco exterior. We do this on the lower levels where we have, you know, mid-rise projects that have metal frame underneath or in the podium. You know, it all depends on the construction, if we have wood frame above or not.

But to your point, Brian, without that one inch of rigid foam, we're not going to hit .148. It's going to be really tough. So just noted to that, you know, comment there.

And then to your other comment, Brian, regarding domestic hot water pipe insulation, that is a special trip. We have that -- we take that credit in the modeling only on projects where we know we have LEED certification involved, because for most of the required HERS testing on a high-rise multifamily, we do not really have to be there in the rough stage, so we would only be there to --

MR. BOZORGCHAMI: Carol, I'm sorry. Your comment is going off, I can't hear you.

MS. ROBERTS: I'm so sorry. I'll try again.

MR. BOZORGCHAMI: I'm going to have to --
MS. ROBERTS: Yeah?
MR. BOZORGCHAMI: -- say, if you could submit your comments in writing.
MS. ROBERTS: Okay.
MR. BOZORGCHAMI: I apologize, I just can't hear you.
MS. ROBERTS: Can we try one other comment?
MR. BOZORGCHAMI: Sure.
MS. ROBERTS: To give it a shot?
160.9(f) regarding electric ready at the central boiler system. I noted from Tuesday's meetings that you had real specific requirements coming in around the ventilation for heat pump water systems -- you know, boiler systems. This electric ready at the central boiler, have all of those things been considered and covered in JA15? Because it's more than just space.
MR. BOZORGCHAMI: We're going to have to get back to you.
MS. ROBERTS: Okay.
MR. BOZORGCHAMI: Danny's going to look at the language and get back to you.
MS. ROBERTS: It involves transformers. It involves ventilation. A lot of these are not on the roof. There's a lot more to it than just power and space --

MR. BOZORGCHAMI: Okay.

MS. ROBERTS: -- to be electric ready at that location.

MR. BOZORGCHAMI: Okay. Yeah. I think Danny will get back to you. Danny Tam. He's going to look at the language one more time.

MS. ROBERTS: Okay. Appreciate it. Thank you.

MR. BOZORGCHAMI: Thank you. Thank you

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

MR. HURLEY: Oh. Thank you. My name is Kurt Hurley. I'm with the City of Berkeley. I'm the Green Building Sustainability Manager. Spelling of my last name, H-U-R-L-E-Y.

Thank you for the updates on the multifamily mandatory. My comment is brief. A suggestion to consider, particularly in California climate zones that have extreme, you know, heating -- cooling degree day-driven energy budgets, to consider a mandatory exterior finish, say, for instance, aged solar reflectance, so that there is a reduced load to our State's peak load from cooling because the building itself can reject shortwave infrared, and the cooling will be, you know, internal gains. Climate Zone 16 comes to mind, but you guys are the experts.

That's my comment. Thank you.

MR. BOZORGCHAMI: Thanks for the comment, Kurt.

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

MR. FAWAZ: Hi there. My name is Hassan Fawaz, F-A-W-A-Z, and I work with Green MEP for Mechanical and Energy.

First of all, we want to thank you for your transparency in letting us see these Code sections ahead of time. It's something I would like to also see encouraged for any UMC-related Code sections for the state.

The second thing I want to talk about is mostly -- I believe exhaust-only is now being taken out of the multifamily as an ability to go with that route, and now it's going to only be supply and balanced only. I apologize if you haven't talked about it just yet. I joined in a few minutes late after the lunch meeting.

So one of the things I want to bring up is while we understand this being very reasonable, and we can definitely see this being no issue for most part of our single-family, I do think we have to be a little more careful when it comes to multifamily as there are times where you really can only go with exhaust-only as a determination, as you can't do exhaust -- supply only if there is a bathroom or kitchen. And then what we also have to keep in mind is, especially when I look at many modular

buildings, a lot of them are made to be smaller, compact, whether that's for low-income, et cetera, and those might not even have a full 10 width from wall to wall. And because we need three feet separation of exhaust from any openings, and 10 feet of separation from outside air, it may not always be feasible. And the thing about modular buildings, anything such that you're not always able to go to the roof with the exhaust, they will have to be stuck into each modular pod. And if you're constantly putting each one by each other, and there's no room in corridors -- if there is a corridor -- there's not much you can do in that situation. And we will not likely be able to use ASHRAE 62.1 modifications for cities like LA anymore as time goes. We do hope that we can see some type of more wiggle room for this, as it might not always be easy to build under mechanicals for this reason.

That was mainly my first point. And then the second point would just be about the same with the metal framing walls. We work with many big architects and contracting teams that are -- many times they do get back to us on multifamily saying, hey, look, we have a very large building, it's just not feasible to install rigid on both sides of this.

Those are my main points. Thank you.

MR. BOZORGCHAMI: Thank you, Hassan.

Carol, you have your hand raised. I'm going to unmute you. Go ahead and state your name and affiliation one more time.

MS. BRAGG: Apologies. I left it up.

MR. BOZORGCHAMI: Oh. No worries. I lowered it. Thank you.

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

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

And again, thank you very much for all the work you did on multifamily. I know last -- you know, a lot of the cleanup is great. Really great to see it moving in that direction. But I do want to echo some concerns with the metal wall mandatory U-Factor dropping. As many have stated, this can be a challenge, especially in projects -- mid-rise podium -- where the plane of the wall continues from below the podium to above. And so now our wall thickness at our lower levels can be different, and it can be quite a challenge to meet our waterproofing requirements from lower levels to upper, where we're continuing to wood. And this, even if we include it in the model, putting it in that rigid insulation, nine times out of 10, as they come to construction and realizing the feasibility of it, it's the first thing they ask for, as it's going to be

increasingly difficult to meet the waterproofing requirements. Totally understand the need for energy efficiency, but trying to be consistent where there are different wall types on a project can really hinder, and I do see this as potentially a place for noncompliance for these projects when building inspectors are out in the field.

And second comment I would like to make is, there are some jurisdictions that it can be a hard time when we're sizing our transformers for central heat pump water heating, but they're still installing gas, so that being electric ready with our gas systems. And I just want to make sure that there is an appropriate pathway if local utilities, local jurisdictions are not allowing or are making it almost impossible to be putting in that extra transformer for future load, and what those considerations might be, what kind of pathway they would need to go forward if they do need to meet those electric grid requirements. But again, that utility interaction can be challenging.

Thank you.

MR. BOZORGCHAMI: Thank you, Marina. I think Javier has a question for you.

MR. PEREZ: Hi Marina. Really quickly, I think Brian's suggestion was to try to match the wall extension,

and general strategies that we have for single-family, where we allow thickness to match the existing frame so that those amounts and different challenges can be accommodated.

But I guess my question to you is, do you have any feedback related to what Brian has suggested for that solution?

MS. BLANCO: I think that's a great add. It does come up quite a bit.

I know that in response to Brian's comment, we're talking about adding spray foam insulation to show compliance with the energy model. We're talking about staggered stud. Absolutely. We encourage builders to do that. However, that is not currently available as a pathway when modeling within the performance software. So documenting this and being able to prove they're still meeting these requirements can get challenging.

So, sorry, Javier, going off on a side tangent. But so, to your point, yes, I would love a wall extension for metal walls. There's existing construction, we do not want to impede the existing infrastructure from being able to maintain an update, and I think that would be a great add. And then for that U-Factor, you know, if we can get it in the software, and be able to prove it with our alternative building pathways, not just framing and rigid,

we might see more viability for this U-Factor.

MR. PEREZ: Okay. Thanks for the additional feedback, Marina. Really appreciate it.

MR. BOZORGCHAMI: Thank you, Marina.

Any more comments?

We have one written comment. Go ahead.

MR. SHEWMAKER: Yes. We have one open comment from Gina Griffiths Rodda: will the HERS verified hot water distribution requirements apply to additions and alterations?

MR. BOZORGCHAMI: Danny's going to respond to that right now.

MR. TAM: Danny Tam, CEC staff. The intent is for newly installed piping to meet this requirement. So we plan to make some edits and to address that.

In addition, I wanted to address the earlier comment about central heat pump water heater with ventilation. So, ventilation requirement is there that require either the refrigerator heat pump to be outside or there are certain requirements for reserve supply ductwork -- supply exhaust ductwork. And inside JA15, it goes into more detail about CFM requirements and extra jobs.

So, I encourage you to review this language and submit any comments to us.

MR. BOZORGCHAMI: Thank you, Danny.

More Mikey? Or that's it?

MR. SHEWMAKER: Just one follow-up comment from Gina, asking to please make it clear in the additions and alterations section that it does not apply.

MR. BOZORGCHAMI: We could probably do some language adjustments. We'll look into it.

MR. SHEWMAKER: No further questions.

MR. BOZORGCHAMI: Thank you, Michael. Thank you, Gina. Don't see any more comments or questions coming in.

So, like I brought this slide up before, please submit your comments in writing. If we missed it today, we'll try to capture it as best we can. Sooner the better than May 13th, but May 13th is the drop date, final call. Thank you.

So next, we're going to go to Javier Perez. has been presenting on the prescriptive requirements of the multifamily newly constructed buildings.

MR. PEREZ: Thanks, Payam.

Again, my name is Javier Perez, and for this segment, I'll be covering the proposed changes in prescriptive performance requirements specific only to multifamily buildings found in Sections 170.0 through 170.2.

Alright. So let's start with the performance language updates. Language in Section 170.1(a) was updated

to reflect terminology changes consistent throughout the 2025 Energy Code. This includes updated language describing Long-term System Costs and Source Energy as the two metrics used for determining compliance for newly constructed buildings. And as part of these updates, language related to Time Dependent Valuation, or TDV, was also removed.

Next slide.

To field verification and compliance credits, for projects where a compliance credit is taken for thermal balancing valves, verification criteria was added, and two compliance credits previously limited to multifamily buildings with three or fewer habitable stories were expanded to multifamily buildings of any story. And this includes low leakage air handling units and variable capacity heat pumps. And as part of the overall effort to simplify our Code compliance credit language related to whole house fans, central fan ventilation cooling systems, and pre-cooling have been removed. These measures were found to be uncommon in most cases and not applicable to multifamily buildings.

Next slide.

Next are the updates to the envelope requirements for newly constructed multifamily buildings. And in Section 170.2(a), under the multifamily prescriptive

fenestration requirements, we're proposing to modify Exception 4 to the prescriptive fenestration visible transmittance standard. In modifying this exception, our intent is to remove the demarcation between low-rise multifamily buildings, three habitable stories or less, and high-rise multifamily buildings that are three, four, or more habitable stories. As proposed, Exception 4 would apply to all multifamily buildings. And we've also refined the minimum visible transmittance, or VT, requirements to be applicable only to fenestration areas that serve common areas. This dials in the VT requirement of spaces that are subject to daylighting requirements of our Code, and that could benefit from higher visible transmittance.

Next slide.

Continuing with fenestration, we're proposing to make the following changes to Table 170.2-A. And for all three fenestration categories, we're proposing to remove the demarcation between low-rise and high-rise multifamily buildings. As proposed, all multifamily buildings, regardless of number of stories, will comply with the same standard. For curtain wall or storefront fenestration, that means a maximum relative solar heat gain coefficient, or RSHGC, of 0.26 in Climate Zones 2, 4, and 6 through 15. For NAFS architectural windows, this means a maximum RSHGC of 0.24, and Climate Zones 2, 4, and 6 through 15, and then

for all other fenestration, that means a maximum RSHGC value of 0.23 in Climate Zones 2, 4, and 6 through 15.

One thing to note is that the proposed -- is that as proposed, there will be no maximum relative solar heat gain coefficient requirement for high-rise multifamily buildings in Climate Zones 1, 3, 5, and 16. Buildings in these Climate Zones could benefit from a higher relative solar heat gain coefficient, which could help reduce space heating loads, which is a predominant energy use in that climate zone.

Now, for curtain wall or storefront windows, and for NEFS architectural windows, we're proposing to update the VT performance -- or the VT standards. As discussed in the previous slide, we're proposing to remove the VT requirements for dwelling units and high-rise multifamily buildings, and apply them to only common use areas. For a curtain wall and storefront, this means a maximum visible transmittance of 0.46 in all climate zones. And for NAFS architectural windows, this means a maximum VT of 0.37.

Next slide.

Similarly, in Section 170.2(a)5B, we're proposing to remove the demarcation between low-rise multifamily buildings and high-rise multifamily buildings for slab perimeter insulation. This means that starting in 2026, all multifamily buildings in Climate Zone 16 that utilize

slab-on-grade construction shall have some level of slab perimeter insulation, which must be 16 inches in depth, or to the depth of the footing of the building, whichever is less. And similar to single-family buildings, we're proposing to correct the thermal conductivity units by which the requirement is expressed. Where previously the requirement was expressed in terms of U-Factor, we're now proposing to use F-Factor, which is more accurate to use for slab floors.

For reference, a U-Factor assumes that there is air on either side of an assembly, whereas F-Factor assumes that one side of the assembly is in contact with air.

Next slide, please.

In Table 170.2-A, we're proposing to make the following changes to the roofing product requirements. For steep slope roofs, high-performance attics utilizing Option B, we're proposing to increase the aged solar reflectance to 0.25 in Climate Zones 10, 11, 13, and 15. This in turn will raise the calculated solar reflectance index to 23, and all other climate zones will remain at their current levels. For low-sloped roofs, high-performance attics utilizing option D, we're proposing to extend the current prescriptive roofing product requirements to Climate Zones 2, 4, 6 through 8, and 12. Those standards include an aged solar reflectance of 0.63, thermal emittance of 0.75, or an

SRI of 75.

Next slide, please.

Alright. Moving on to the prescriptive requirements for ventilation updates.

In Section 170.2(c), prescriptive requirements for balanced ventilation systems for HRE and ERV systems, we're revising the prescriptive language such that new construction -- or newly constructed multifamily buildings in Climate Zones 1, 2, 4, 11 through 14, and 16 must use balanced ventilation systems with HRV or ERV systems. Other changes to this Section include an involved language revision specifically to revise -- specific to revising cost-effective climate zones. In Section 170.2(c)3Bv, dwelling unit ventilation prescriptive requirements, we added language for dwelling unit ventilation requirements requiring all HRV or ERV systems that serve individual dwelling units to have a fault indicator display. It's field-verified, as specified in joint appendix JA17.

As part of that reference to JA17, we're adding a new section to the reference appendices. This includes qualification requirements for indoor quality system fault indicator displays, or FIDs. JA17 includes subsections elaborating on the introduction, fault indication categories, fault indication means, instrumentation, and reporting and manufacturer certification requirements.

Next slide.

In referenced residential Appendix RA3.8.3, in addition to the existing one-point air tightness tests, we're adding language to also allow multi-point air tests for conducting the enclosure leakage test following the RESNET 380 Section 4.4.2. In RA 3.8.4, determination of test results, there was an editorial change to add the word "if" to clarify if the leakage airflow test at CFM 50 was determined by one point air tightness tests specified in RESNET 380 Section 4.4.1.

Next slide, please.

Now, for consistency, the same updates that were made for RA3, as discussed in the previous slide, were made to RA2.

Alright. Moving on to the multifamily prescriptive water heating updates in Section 170.2(d), to improve clarity of these requirements, the water heating recirculation system requirements have been reorganized and separated into individual dwelling systems in Section (d)1 and central systems in (d)2. In Section 170.2(d)1, individual water heating systems, Option C for gas instantaneous water heaters has been removed. In parallel, we added Exception 1 to allow gas instantaneous water heaters in high-rise multifamily buildings. The result of this change is that low-rise multifamily buildings with

individual water heating systems serving individual dwelling units are prescriptively required to be a heat pump water heater. Now, as with all prescriptive requirements, this prescriptive heat pump water heating requirement is not mandatory. Where one would prefer to install a gas water heater, this can always be done, demonstrating compliance with the performance approach.

We also added a new exception for 120-volt heat pump water heaters for dwelling units with one bedroom or less. This aligns with the existing 120-volt exception for newly constructed single-family buildings.

Next.

Moving on to central water heating system. When one selects to design a building with a central heat pump water heater, the prescriptive requirements for central heat pump water heaters has been updated. A new alternative path has been added for systems that are certified to NEEA advanced water heater specifications for commercial heat pump water heaters of level Tier 2 or higher. And we also modified the existing requirements for clarity. Prescriptively, the primary heat pump is required to be a single-pass system, and we removed the existing storage tank plumbing configuration requirement to allow design flexibility. As a note, multi-pass systems can still comply using the performance compliance approach, or

by using a new Tier 2 or higher water heating system. The central system recirculation language has also been consolidated to Section 170.2(d)2D.

Next slide.

The final two changes for domestic water heating systems and multifamily buildings are as follows. Related to pipe sizing, a new prescriptive requirement for central hot water distribution piping, to be sized in accordance with California Plumbing Code Appendix M, has been added for this 2025 Cycle. Also a new prescriptive requirement for central systems to have a thermostatic master mixing valve has been added. In support of this new requirement, there's a new Reference Appendix section, RA4.4.19. The new RA language includes procedures for installation and commissioning.

Next slide.

Now let's go over the prescriptive multifamily photovoltaic and energy storage system updates for newly constructed multifamily buildings.

For 2025 low-rise multifamily buildings, we're updating multiple components of the photovoltaic system requirements in a similar fashion as proposed for single-family buildings this morning. Now, these factors will result in the same PV system size requirement as the 2022 Standards, if an EER2 is equal to or greater than 11.7 for

the space conditioning systems for that building. And we still have the same size capacity factor -- sorry, we still have a size capacity factor, which is A, and the dwelling manufacturer, which is B. Now, the new component that we're adding to this calculation is one related to the proposed building's HVAC system's EER2 rating. Now, this is being proposed as a reduction to the minimum PV system size that corresponds to the EER2 rating of the proposed space conditioning system. For climate zones where an HVAC system's EER2 rating resulted in LSE savings when compared to the minimum value of seven, the part of the equation that's circled in red on the slide will reduce the minimum PV system size requirement for compliance. This reduction in size is capped at an EER2 of 11.7. For multifamily dwelling units where different EER2 values exist for different HVAC systems, the average EER2 of those systems may be used.

And moving on to the performance approach, we're proposing to use a prescriptive calculation to determine the standard design PV system size, and this follows the practice that's already in place for nonresidential and high-rise residential buildings.

Next slide.

Now, for this slide, we used our two-story dwelling unit, 7,320-square-foot prototype, and we're

showing the results of the PV system size required with varying EER2 values from 11.7 to 10 to 9 to 7. Now, the climate zones with major differences in PV system size requirements are in Climate Zones 11, 13, and 15, which have higher cooling loads and generally hotter days. The other climate zones have less significant effects, especially in coastal climates where there's a zero and there are no effects, no PV sizing modification requirements.

Finally, related to low-rise multifamily buildings that have solar access limitations, this is consistent with what we're doing in nonresidential and single-family. We're proposing minimum PV capacity requirements that vary depending on the pitch of the roof. For roofs with a pitch less than 2 to 12, the minimum PV system size is proposed to be determined by multiplying Solar Access Roof Area by 14 watts per square foot.

One more slide. Next slide.

123, go up one for me. That one, thanks.

Now for roofs with a pitch greater than or equal to 2 to 12, the multiplier is proposed to be 18 watts per square foot Solar Access Roof Area. Now the final change proposed for the PV system requirements for low-rise residential buildings is increasing the small PV system size exception from 1.8 kW to 4 kW. This 4 kW exception

already exists for high-rise multifamily and nonresidential building, and our intent is to align this exception across these building types.

Next slide.

Now, moving to high-rise multifamily PV system requirements, the minimum PV system size equation, the standard design PV system size determination, and the multipliers are proposed to remain unchanged.

For buildings with -- excuse me -- for buildings with Solar Access Roof Area limitations, however, similar to what we just discussed for low-rise multifamily and what's added for non-res and -- for non-res, we're proposing minimum PV capacity requirements that vary depending on the pitch of the roof. Again, that just means you have a pitch of 2 to 12 or less. The minimum PV system size is proposed to be determined by multiplying the Solar Access Roof Area by 14 watts per square foot, and for roofs with a pitch greater than 2 to 12, the multiplier is proposed to be 18 watts per square foot.

Next slide.

Now for the battery storage system requirements for high-res multifamily buildings, we're proposing to change the equation to make the required battery storage kWh size directly proportional to the conditioned floor area rather than the KWPC of the PV system.

And there are two equations. The first equation will be used when the required PV system size was calculated using the PV equation from the previous slide. Now, for scenarios where a building's Solar Access Roof Area is limited, the adjustment factor must be applied. This adjustment factor is circled in red on the slide for reference, and then the denominator is the kWPV calculated from the equation, while the numerator, the kWCPDc, is calculated from the Solar Access Roof Area multiplier, multiplying by 14 or 18, depending on the slope of the root.

For power capacity, we assume four-hour battery storage. As a result, the required power capacity would simply be the kWH divided by four. As with the 2022 cycle, for mixed occupancy buildings, the total battery system capacity for the building must be determined by applying the minimum rated usable energy capacity to each of the listed building types and summing all capacities. And finally, the PV approach -- I'm sorry, the performance approach remains the same.

This table shows the updated capacity factors for high-rise multifamily battery system requirements, and these battery KWH requirements are not changed compared to the 2022 Code. While the Factor B is a watt-hour per square foot rather than a watt-hour per DC wattage of PV,

for high-rise multifamily building types, the battery kWH requirements are not changed.

In parallel with the PV and energy storage system requirement updates, we're proposing updates to definitions to help clarify the intent of our requirements and systems we're covering. Of note, the battery energy storage system definition originates from the IECC and was added to our proposal requirements, in consultation with CAL FIRE. Usable capacity is a term that the industry has taken to be defined as -- has asked to be defined to help clarify what capacity counts when complying with the Energy Code's minimum battery energy storage system requirements.

Next slide.

Now, continuing with JA12 requirements for battery energy storage systems, UL1741 SB was added as an option in addition to the UL1741 SA for certifications of inverters used in battery energy storage systems. The UL1741 Supplement SB is the product testing standard used by testing agencies to evaluate products to certify their compliance with the IAEA 1547-2018 and 1547.1-2020. We've also removed the minimum 5 kWh requirement from prescriptive compliance, and clarified that smaller batteries can be used as long as the sum of the battery usable capacity adds to 5 kW -- up to at least 5kWh per building. For general control requirements, we've removed

the subsections (c) and (d) regarding requirements for its twice per year reset and backup behavior.

Next slide.

And to round out our updates on the -- updates to Joint Appendix J12 requirements related to multifamily battery energy storage systems, we're proposing to introduce a new control strategy called Price Optimization Control. We went over this yesterday for nonresidential, but we're going to hit it again for multifamily buildings. So this strategy will be in addition to the other control strategies, which are basic TOU or Advanced Demand Response. The price optimization control option is proposed to be added to represent nonresidential buildings that have battery energy storage systems controlled by third-party energy management systems, which optimize discharging of batteries for things like reducing demand charges in ways that do not align with our current control strategies that are basic TOU or Advanced DR controls. This algorithm will be embedded into our CBECC software and is yet to be developed. We intend to work with battery manufacturers, certainly in the nonresidential market, to help develop this algorithm for this control strategy.

Also, Section JA12.6 related to interconnection and energy meter requirements has been removed.

And finally, we've created requirements for

certifications for JA12. For multifamily battery energy storage system listings, we're requiring that the specification seat document the usable capacity of round-trip efficiency, and other characteristics addressed in Section JA12.3.2.

Now, that concludes the CEC's proposed changes to the prescriptive requirements for newly constructed multifamily buildings. We'll now pause for questions and for public comment.

MR. BOZORGCHAMI: Thank you, Javier.

If you have any comments, questions, in the room. I see none.

We have a few hands raised. I'm going to start with Gina. Go ahead, Gina. State your name and affiliation, please.

MS. RODDA: Gina Griffiths Rodda, G-R-I-F-F-I-T-H-S R-O-D-D-A, Energy -- Gabel Energy. I'm back. Sorry, I was teaching this morning.

First, I want to thank you for the changes that you're making to low-rise multifamily aligning with nonresidential and high-rise multifamily with the SARA methodology. Thank you. And thank you so much for supporting the battery calculation methodology to support SARA. That was a big miss in the past.

And I have docketed this in the past -- and I'm

sorry, Javier, I've got to say it again -- I hate the EER add to the prescriptive formula, I'm going to say it out loud. Thank you.

MR. PEREZ: I appreciate the comment, Gina, and no feelings hurt. You're fine.

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

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

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

And I just have a couple of questions more related to the prescriptive requirements and how they're going to relate to the performance section of this part of the Code. I know that now the balanced ventilation is going to be requiring our air leakage tests in our dwelling units, and I saw that the language for low-rise multifamily still had the dwelling unit -- or the building envelope leakage testing still in there as a performance option. Is that going to remain as a performance option? And if so, would the baseline it has to test to, would it have to be lower than the balanced ventilation system requirements for envelope leakage testing? That's a question.

And then my other question is, for climate zones that do not have an SHGC requirement prescriptively, is

that also going to mean that within the performance software they are not going to -- they're going to have no requirement as well?

Thank you.

MR. BOZORGCHAMI: So let's start with the easier one, the SHGC question. That's either going to be as a (indiscernible) standard is proposed. I have to double check with Haile Bucaneg, our lead on the ACM, but I'll get back to you.

Regarding your dwelling unit, I think I'm going to have to get back on that one too. I believe it's going to stay as-is, as a dwelling unit, but I need to confirm that with one of our subject matters.

MS. BLANCO: Thank you.

MS. GOEBES: Payam, this is Marian Goebes. Do you want me to answer her question about the --

MR. BOZORGCHAMI: Please.

MS. GOEBES: Yeah. Great.

Thanks, Marina. Great question. So I wanted -- this is Marian Goebes. I'm the Lead for the Multifamily IAQ Case Report from the Codes and Standards Enhancement Team. And thank you for the CEC for all the great collaboration along the way. So just clarifying, the balanced ventilation or supply-only ventilation requirement is only for multifamily, not for single-family. So single-

family can still use exhaust only.

And then your question about dual and unit leakage as a performance option, that's only available for single-family. So for single-family, you can get energy savings credit if you go below the ACH50, you know, assumption, and then for multifamily, you can't get credit for that. The reason is that you don't know -- if you are building tighter than that compartmentalization requirement, you don't know if that air is coming from the outside, where you would get energy savings, or from adjacent spaces like other units.

So again, balanced or supply only ventilation is only going to be required for multifamily, not single-family. And single-family can claim credit for that reduced dwelling unit leakage, but not multifamily.

MR. BOZORGCHAMI: Marina, I've not muted you, so if you have any questions.

MS. BLANCO: Sorry. Yeah, I was typing it thinking I was muted.

Then I would just request that the section of Code gets cleaned up because I do believe that within the performance section of the multifamily part -- multifamily chapter -- it still does offer a building envelope leakage and Reference Appendices to the residential Reference Appendices. So if that's not true, then that can be

removed, because it is also still -- you can still model that lower envelope leakage testing within the multifamily software currently.

MS. GOEBES: Okay, thanks for catching that. Thank you, Marina.

MS. BLANCO: Yep.

MR. BOZORGCHAMI: Thank you. I think we're going to have to do some adjustments. We'll make that happen.

MR. PEREZ: Thanks for your attention to detail.

MR. BOZORGCHAMI: I don't see any more raised hands. If I miss someone, please raise your hand and I'll unmute you, but I don't see anybody at this time.

Mikey?

MR. SHEWMAKER: Yeah. We have one online question from Luke Morton: regarding PV sizing with EER2, can you clarify the average should be conditioned area weighted, capacity weighted average, or just a straight average of installed equipment, regardless of capacity?

MR. TAM: Danny Tam, CEC staff. For the prescriptive, I think our current thinking is just a straight average, but we haven't decided, so we'll take comments on that. For performance, the software have the capability to calculate for each unit what's corresponding for the PV requirements.

MR. BOZORGCHAMI: Thank you, Danny, for your

response.

Do you have any other comments?

MR. SHEWMAKER: No more other questions.

MR. BOZORGCHAMI: Anything in the rooms?

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

MS. ROBERTS: Hi. Carol Roberts, R-O-B-E-R-T-S, g.r.e.g. Consulting.

Quick question. Going back to the SARA roof calculation with the low -- with the flat roof versus a steep slope or pitched roof, you know, we have a lot of buildings that do, for architectural requirements, they have a lot of sloped tile roofs around the perimeters of the buildings, and then we have this nice, beautiful, expansive flat roof. And is the expectation now that when we're using the SARA calculation that we are using two separate formulas, number one, because we have to include available roof area? And with this, question number two is, with the kind of blending of low-rise and high-rise multifamily in roof and SARA calcs, will we be able to omit the north-facing steep slope roofs, if we have to count them with the other formula?

MR. BOZORGCHAMI: So I'm going to have Mohammad Saeed, our Senior Electrical Engineer who worked on this, respond to you.

MS. ROBERTS: Okay.

MR. SAEED: Hi. This is Mohammad Saeed, CEC staff. Can you guys hear me?

MR. BOZORGCHAMI: Perfect. Thank you, Mohammad.

MR. SAEED: Yeah. The reason we have -- I mean, we did two slopes initially, because expectation is that if you have the high sloped roof, right, then you are going to most probably put the panels flat with that slope. Right? It means that you can cover more ground with that. That is why it is the SARA times 18 watt per square feet. But if you think that there may be some situations in which that might not be possible, then yeah, definitely I would like you to submit that comment for that.

Also, you said that about the north-facing roofs. I think we are not changing anything with that. I mean, you just have, it's the same SARA calculation, and you have to use the same solar assessment tools, like before. It's just that the threshold -- you know, the SARA times 14 and SARA times 18 -- that will be depending on your roof slope. So you are going to use one equation, but which equation, that will be determined by the roof slope. But if you have multiple roof slopes, I think then, yeah, for some roofs, you will have to use the first equation and some for second. It all depends on the, you know, the roof slope.

But yeah, definitely, I would like to, you know,

you to docket the comment, and we will definitely get back to you for any clarification.

Thank you.

MS. ROBERTS: I have one other point to add to that, if we could, which I'll add to the docket for consideration.

These are generally not very large, expansive slope areas, right? They barely hold one panel, and that's on the horizontal or portrait kind of layout, because they're not deep enough to hold more than one, maybe two, panels. So by having a higher multiplier for that space, that square footage, I think we're working against the opportunity of what kind of panel we can place in that location, where we are, you know, throwing away three and a half feet of a strip of a long length of a building because it will not hold the second row of panels. But we're getting -- we have to count that square footage in the formula, and we now have a higher multiplier for that square footage it is really unusable. I'll add that to the note, but I would like to maybe have that consideration for, what do we do in these smaller? If they're not going to necessarily be under 80 particular square feet --

MR. SAEED: Yeah. Yeah.

MS. ROBERTS: at the end of the day.

MR. SAEED: Yeah. Definitely. And I would like,

whenever you docket the comment, definitely send some examples, the one that you are talking about, the small strips, so that we can take a look and take that into consideration. Yeah.

MS. ROBERTS: Okay. Thank you.

MR. SAEED: Thank you. Thank you very much.

MS. ROBERTS: Appreciate it.

MR. BOZORGCHAMI: Thank you, Carol. Thank you, Mohammad.

Carol, if it's possible, if we can get a sketch of that, that'd be great, actually. We could talk it amongst us, make the adjustments.

Thank you.

MS. ROBERTS: You've got it.

MR. BOZORGCHAMI: Thank you. I don't see any more raised hands, and I don't see anyone in the room.

Mikey has two comments. So go ahead, Mikey.

MR. SHEWMAKER: Yeah. We had a couple more questions and comments come into the chat.

So, from Luke Morton: a clarifying question, steep slope roofs sound like they should be calculated on the plane of view and not the actual area?

MR. SAEED: So, this is Mohammad Saeed again.

It's going to be the actual area, minus any, you know, subtraction needed for any State Code. You know, for

example, for the fire marshal, like three feet or one and a half feet depending on the Code language. So, yeah, it's an actual area multiplied by 18.

Is that the -- I hope that's the answer to the question you --

MR. BOZORGCHAMI: Yeah, you're right. Correct, Mohammad. That is true.

MR. SHEWMAKER: Thanks, Mohammad. Next is a comment from Gina Griffiths Rodda: steep slope on a roof perimeter feature might not be capable of supporting PV -- maybe there needs to be a certain width, like we have to for solar readiness.

MR. SAEED: Yeah, definitely, Gina. I mean, if you can provide the examples of what kind of roof by the perimeter feature, that will provide some hindrance for a roof for PV support, then we will definitely take that into consideration. Yeah.

MR. BOZORGCHAMI: Thank you, Mohammad. Thank you, everyone.

Again, the favorite slide of the day. Please submit your comments. The sooner the better. There's some really good comments that I think staff need to view, visually understand, and the sooner we get those, I think we're going to have a better, productive set of standards.

Next, we were going to take a break. I think

we're going to push through. We've got enough time.

And then the Section 180 is the multifamily additions, alterations, it's not that large.

So Javier, can you -- can we do that?

MR. PEREZ: Yes, please.

Okay. So the last bit here. So hold on tight. Thanks for staying with us. Very much appreciated.

Alright. It's moving on to additions and alterations to existing multifamily buildings.

Next slide, please.

Starting with Section 180.1(a)2, indoor air quality for additions, language in (a)2 and subsection (a)2ii, or Roman numeral 2, was added to ensure and improve general clarity and maintain internal consistency with the Energy Code. This revised language doesn't change the requirements of this section. In (a)2, an exception was added to clarify that compartmentalization is not required for additions. And (a)2Aii, whole-dwelling -- I'm sorry, whole-dwelling units and mechanical ventilation requirements for additions and existing dwelling units that increase conditioned floor area by more than 1,000 square feet, we added an exception to clarify the mechanical ventilation systems, in addition, shall be supply, balanced, or the existing ventilation type. And what that's generally saying is if you had existing ventilation

systems that were exhaust, they can continue to be exhaust, post this addition.

Next slide, please.

Moving to Section 180.2 for alterations to existing multifamily ventilation systems. The added language in subsection (b)5 and (b)5A and (b)5Aii was, again, improving clarity and maintaining internal consistency, and not into any of the changed requirements of this section. Now, more specifically in (b)5, mechanical ventilation and indoor quality for dwelling units, an exception was added to clarify that, again, compartmentalization is not required for alterations. In (b)5A, entirely new or complete replacement ventilation systems, an exception was added to again clarify that new or replacement ventilation systems shall be supply, balanced, or again, the existing ventilation type that is being replaced. In subsection (b)5Bia, whole-dwelling unit ventilation system type, the language was added to clarify that altered ventilation systems shall be supply, balanced, or, again, existing ventilation system type.

Next slide, please.

The final change that we'll cover for today is for alterations to fenestration products, including skylights.

In Table 180.2-B, we're proposing to make the

following changes for fenestration. For all four fenestration category types, we're proposing to remove the maximum RSHGC standard for Climate Zones 1, 3, 5, and 16. This aligns with the requirements for new construction. Specifically for curtain wall, storefront, and window walls, we're proposing to separate out glazed doors, which are included as part of the all other windows and glazed door fenestration category. For all other windows and glazed doors, we're proposing to reduce the maximum U-Factor requirements to 0.28 in Climate Zones 1, 3 through 5, 11, and 13 through 16. And for skylights, we're proposing to consolidate the prescriptive standards for low-rise multifamily buildings and high-rise multifamily buildings. As proposed, again, similar to what we're proposing in new construction, all multifamily buildings would comply with the same standards, regardless of building height. And for U-Factor, that's 0.46 in all Climate Zones, and relative solar heat gain, that's 0.25 in Climate Zones 2, 4, and 8 through 15.

And that concludes the CEC's proposed changes to the additions and alteration requirements for newly constructed -- I'm sorry, to additions and alteration requirements for multifamily buildings.

I will now pause for any questions or public comments. I think we've got one raised hand.

MR. BOZORGCHAMI: Before we go to the phone, anybody -- so go right to the phone line.

Gina, go ahead, and state your name and affiliation. Thank you.

MS. RODDA: Gina Griffiths Rodda, G-R-I-F-F-I-T-H-S R-O-D-D-A, Gabel Energy. I just want to say the cleanup of what you guys have in the add alt Section for multifamily for ventilation is fantastic, because as I've already commented, we always forget, it seems to be, how do these requirements apply to additions and alteration. And Maureen did a great job of making sure that was very -- Marina, I'm sorry, not Maureen, Marina -- did a great job making sure that was clear.

Thank you.

MR. BOZORGCHAMI: Thank you, Gina.

I have no other questions. Thank you. I have no questions in here.

What I'm going to do -- Commissioner, if it's okay with you, I'm going to open it up for any comments of anything you heard today, this morning, this afternoon, any thoughts.

Oh, I have one raised hand. Anne, go ahead and state your name and affiliation, please.

MS. PERNICK: Hi. Can you hear me okay?

MR. BOZORGCHAMI: Perfect. Thank you.

MS. PERNICK: Hi. This is Anne Pernick, and my name is spelled A-N-N-E, last name is P-E-R, N as in Nancy, I-C-K. I am with SAFE cities at Stand.Eart.

And I wanted to applaud the CEC for introducing a prescriptive requirement for heat pump space and water heating in all climate zones for residential buildings, and applaud the CEC's decision to include the new construction heat pump baselines for space and water heaters in additions. And I also want to ask you to please maintain these requirements in the final standards, and also say that removing the language from the Draft Express Terms on alteration where an A/C system would be replaced by heat pump was a missed opportunity to improve air quality for Californians, drive the heat pump market, and accelerate heat pump adoption, and to ask you to please move the prescriptive requirement for a heat pump to replace an air conditioner in existing single-family homes from the voluntary Section Part 11 of CALGreen back to the Energy Code Part 6. And that way Californians will not miss out.

This is a no-regrets opportunity to cut planet warming emissions, improve the health and safety of homes, and benefit consumers by encouraging the installation of energy-saving heat pumps when air conditioning units burn out.

Thank you very much.

MR. BOZORGCHAMI: Thank you Anne, and if you could come document those comments, that would be great. Thank you.

MS. PERNICK: Absolutely. Thank you.

MR. BOZORGCHAMI: Nehemiah, go ahead and unmute yourself, state your name and last name, and your affiliation. Wow.

MR. STONE: Nehemiah Stone, last name S-T-O-N-E. There's no D at the end. Stone Energy Associates.

You heard a comment earlier that there should be an exception for -- to allow exhaust only in some situations with multifamily. I would like to state that I believe that is not the case. There's plenty of reasons, plenty of research, showing that exhaust only too often doesn't, and actually can cause problems with the kitchen exhaust. And additionally, the tenants will never have the opportunity to change that themselves. And the owner of the property, the builder of the property, is the only one that can make that work, and it may be more expensive for them in some cases is to try to figure out how to get the balanced or supply type of ventilation. That expense is way, way less than what the tenants could experience in terms of health costs and lost work.

Thank you.

MR. BOZORGCHAMI: Thank you, Nehemiah. Just

wanted to point out that that work was done by -- a lot of that work was done with our CASE team, which I thank them very much, and also Anushka Raut, our Air Pollution Specialist, who, as soon as she got hired on, she rolled up her sleeves and went at it working on this.

But thank you, folks, for helping out with that work.

Next, we have Gina Griffiths. Go ahead, and state --

MS. RODDA: Again, it's Gina Griffith Rodda, G-R-I-F-F-I-T-H-S R-O-D-D-A, Gabel Energy.

I want to reiterate Nehemiah's comment. When these first came out, people really were all for balanced ventilation, and I had a lot of my multifamily clients really look at, what can they do to the design of the building to support the intake and outtake, and the distance needed. And sometimes that meant reconfiguring the facade of the building. It's doable, and it supports health and safety.

I do also want to put on record that I do not agree with there being heat pump requirements for alterations. The cost effectiveness is not supported, and it's going to drive people away from enforcing the Code if we start putting in requirements that are going to be very difficult for homeowners to achieve.

Thank you.

MR. BOZORGCHAMI: Thank you for those comments, Gina.

Carol, I'm going to unmute you, and please state your name and last name.

And I apologize, Carol, you're coming in a little bit light. Can you maybe get closer to the microphone if possible? Or maybe shout a little bit more? I'm having a hard time.

MS. ROBERTS: Okay. Is this any better?

COMMISSIONER MCALLISTER: I mean not really.

MR. BOZORGCHAMI: Sorry.

MS. ROBERTS: I'm so sorry.

MR. BOZORGCHAMI: No worries.

MS. ROBERTS: I will holler the best I can. I'll try to keep it short. I do have a couple comments.

To follow up the heat pump requirement to not be moved to Part 11, I do agree with Gina's statement. That is a huge cost delta. It's not just a one-to-one change out, you don't take the A/C unit that died while your furnace is working and put a heat pump out there. It's a major difference in cost, and the refrigerants are usually not supported, in that you have to do the whole system again.

My other comment is to exhaust. I would -- I

think exhaust has its place, exhaust ventilation. What we see in the field is that we don't have enough good language to back us up for a good exhaust design. We have exhaust fans in small apartments that are -- that need 40 to 50 CFM total continuous ventilation, but because we can assign an 80 CFM fan, it is being hardwired with an on-off switch at the same place as the light, and we can preach best practice all day long, but when that GC is value-engineering, it is not going to happen. We are not getting the best work, and we don't have any support to get better design and better equipment enforceable -- that's enforceable. So yes, people are going to jury rig it. They're going to undo it as soon as they can take that thing and shut it off. It's loud and annoying. So I'm sorry to see that option going away. I would like to have it had it been better supported in the field.

I had one more thing. Sorry, and I'm trying not to yell, that I am -- oh, on PV systems being powered up and actually supporting all-electric buildings. We are just now beginning some studies in primarily affordable housing buildings, because they are always the ones at the forefront, because they're pushed into these things sooner than market rate. We are studying their bills with the utility. And we are finding that very often it is six months to a year before their PV system is actually

energized in their all-electric building with their failing water, you know, heat pump water boiler systems. And it is not cost effective, and it's not delivering hot water. There's so many things happening on the ground now. We have real data to look at. We have real projects to look at. We're not looking at 2020 studies, for back when this was implemented in the last Code cycle. I mean, we are -- we have data now. We have to help -- we have to help these building operators get their PV going so that they can find that benefit, and find those offsets that they promised. And in the CUAC, they promised offsets to their tenant, and that could be 50 percent of their utility bill, where the owner is either happy to pay that until that system's energized. And with -- you know, we cross our fingers and only hope that they get the savings that the CUAC predicted.

I do want to reach out, you know, shout out to the CUAC team. They've done amazing work in the software, as everyone has at all the software, but we've really come a long, long way on that, and we really appreciate everyone's hard work to get that right. Now I just need the building to back it up.

MR. BOZORGCHAMI: Thank you for those comments.

Carol, I sincerely apologize. You are coming in a little bit soft, and I do want to be able to see the

comments.

Could you please submit a comment into the docket? Apologies.

MS. ROBERTS: Will do.

MR. BOZORGCHAMI: Really, sorry.

I'm going to spill the beans here a little bit. There's going to be a tentative scheduled date for Part 11 is scheduled for June 5th. So I invite you all to keep an eye on that notice, and details are to come, but there will be discussions on heat pump alterations during that workshop also.

With that, I have one more hand. Hassan, I'm going to unmute you. Go ahead and state your name and affiliation.

MR. FAWAZ: Hi there. My name is Hassan Fawaz, F-A-W-A-Z, in affiliation with Green MEP for Mechanical and Energy.

It's somewhat to do with the exhaust only. Again, I'm not going to reiterate what I've said, but instead I want to bring up a new topic that I'd like to talk about in regards to ERVs and HRVs regarding balanced ventilation and the feasibility of this. I've talked before with vendors from Renew Air, who work with ERVs that are able to be put in multifamily, as they're only about 10 inches in height. They had some interesting cosections in,

let's say, Washington, up north, where they allowed less than 10 feet separation. And all they had to do was provide a manufacturer guarantee that there's less than 2 percent chance of any -- 2 percent of any infiltration coming from the exhausts back into the intake. I think if that were to be helped -- implemented, it would make, if exhaust only has to go through, and everything goes through with that, ERVs can be a good option. It increases energy recovery. It makes it so much more efficient for the building than just a separate outside air fan, and not just for mandatory requirements, but to help with the prescriptive. It would be great to have some type of thing where we can balance between Mechanical Code, Energy Code for the State, to allow some type of additional exception to, if you have an ERV that allows less than 2 percent of the infiltration coming in, that we can use that to be within a certain distance that's feasible, let's say five feet or so, when sometimes they're even put right next to each other, having that type of infiltration requirement.

If there's some type of coordination that they can done with the California State for mechanical energy, to allow ERVs to have that type of separation, I feel like it'd be a lot more common to see ERVs.

MR. BOZORGCHAMI: Thank you, Hassan, for the comment.

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

MR. TIFFANY: Yeah. Hi, guys. Ted Tiffany. Tiffany is T-I-F-F-A-N-Y. Speaking on behalf of myself, but I do work for the Building Decarbonization Coalition.

I just want to thank the CEC Commissioner. Commissioner McAllister, your staff has done an incredible job this Code cycle, and appreciate all the advocates stepping up today and providing their technical comments. You know, we've had a lot of people that have been following the standards for quite a while provide some fantastic comments today. And, you know, a lot of them in support of the dual heat pump baselines, and I want to make sure that you guys maintain those for both residential and nonresidential as well. And we'll, staff, make sure we do some cleanup to make sure those prescriptions are cost-effective and easily to implement.

I want to applaud you on the inclusion of A/C heat pump for additions, and want to encourage major alterations as well. And to kind of just push back on one thing that Gina had noted about the alterations being enforceable, it's going to be much harder to enforce and puts a burden on the local jurisdictions to both, not only go through the adoption process, but also the enforcement, jurisdiction by jurisdiction. Industry, AIA, ASHRAE, all

of the designers that have to implement code by code, county by county, city by city. It just makes the burden a little bit (audio cuts out). I just want to make sure, you know, if there is an opportunity to keep that in Part 6, the enforceability is there for us.

But generally, I want to thank Commissioner McAllister, you and your staff, again. Nice work on this, and we'll help you see this to the finish line.

I appreciate all your help.

MR. BOZORGCHAMI: Thank you, Ted.

I don't see any raised hands. I don't see any comments.

MR. SHEWMAKER: No open questions.

MR. BOZORGCHAMI: We have no open questions.

Commissioner, before we open up to all of the Title 24 Part 6, just for today, if you'd like to give some remarks.

COMMISSIONER MCALLISTER: Sure.

So I just want to thank everyone who's been with us through the long haul here, all three days, and for many, many months, and really years before today.

I agree with, you know, the assessments. I totally agree with the kudos to staff. It's just been -- there's so many topics here, and we have expertise on every single one of them in the building, and a great stakeholder

group out there helping us get it right. So I'm really happy with where we're landing here.

On heat pumps, I guess just high-level, I think we all are in just thunderous agreement that heat pump retrofits -- you know, heat pumps in new construction, certainly -- but also retrofits are a key measure, perhaps the key measure, for decarbonizing our buildings. And so it's not whether we, you know, work this out to help the retrofit market really get to scale, it's how we're going to go about that, and summit the timeframe, but we all feel a lot of urgency. And, you know -- but there are bigger, there are a whole bunch of issues around particularly HVAC retrofits that we have to solve while we're doing this.

You know, in theory -- you know, I agree with Ted. In theory enforceability is there, and the rule of law is there. Local jurisdictions are supposed to enforce the Building Code. But in HVAC retrofits, we just have a dismal record of getting even permits pulled, not to mention the building department actually working through to close out those permits. And so that's just a harsh reality.

And there are a lot of reasons for that. And many of them don't rest with the Energy Commission. It's just -- it's person power, and kind of the, you know, economies that -- the situation of the consumer, the

economies of the contractors, and just whole ecosystem there that really needs an integrated look. And so, you know, I do think that when we increase requirements, it does drive, you know, more installations underground. Most HVAC retrofits are already underground.

So I think that we really want to sort of roll up our sleeves and work with all of you to solve that issue, along with the way the Code treats heat pump retrofits. so you know it's not -- it's not that -- I mean, I think we all want to get there. And so the question is, you know, can we really lock arms and walk down the road together to get there. So I know we can, and we're certainly committed to doing that.

And, you know, we'll look forward to the to the Part 11 discussion that Payam mentioned. So comment. Submit your written comments. You know, I'll ask -- well, it's already up there. There you go. No doubt. And the deadline is May 13th, so really encourage lots of great comments. And some of them are kind of shorthand because of the time limitations and the setup here, so really would appreciate everybody putting their thoughts down completely and in writing, submitting those to the docket. And of course, staff is always -- and actually my advisor who's been with us for three days, Hughson Garnier, feel free to contact him as well. Really, we're listening, our ears are

wide open, and we want to work through these remaining issues and land those in the right place.

But overall, really happy with where things are, and just really grateful for all the participation from stakeholders across the land, and staff here at the Commission.

So with that I pass back to you, Payam.

MR. BOZORGCHAMI: Thank you, Commissioner.

So with that, I'm going to ask one more time for any comments or any concerns, questions, from the past three days of hearings that we've had. Is there anyone that has anything that they want to add, or was there something we missed that you wanted to bring up?

I see Nehemiah has his hand up. Go ahead, Nehemiah.

MR. STONE: Yeah. Nehemiah Stone, S-T-O-N-E.

I just want, in response to something that you said, Commissioner McAllister, there was -- Ted Tiffany and many others were involved in a group called the Compliance Improvement Advisory Group a little more than 10 years ago. A number of papers we wrote cover a lot of the compliance-improvement issues, and I would recommend that you and the staff go back and take a look at some of those papers, because they can, you know, if the suggestions are followed, they can help improve compliance.

We're never going to have perfect compliance. I mean, I think that, you know, that's an honest assessment that we need to come to terms with, but we can still improve compliance, and there's a lot of really good suggestions that came out of the Compliance Improvement Advisory Group.

Thank you.

COMMISSIONER MCALLISTER: Thanks, Nehemiah. I really appreciate that.

And I remember that well. And, you know, many of those recommendations made their way into the AB 758 Existing Buildings Report and have, you know, maintained a life since then as well. So, many of those recommendations are current recommendations.

I think where we've experienced a little bit of frustration is just closing that informational gap to know when, you know, projects are happening at all. And when I said there were abysmally low permitting rates, that is more on the residential side than the commercial side, but, you know, it's kind of across the board. We have a system set up that is not being applied to the majority of installations on the residential side, for sure. So we need to close that informational gap in terms of knowing what equipment is coming into the state, and more or less where it's going. And, you know, we worked with the

legislature for a few years on that, and so far haven't gotten there. But, you know, the Energy Commission is going to start to be more proactive on that front, because that's sort of the platform on which many of these actions that the Commission, the local governments, and others could be taking have to rest. Right? Is on good information.

And so, you know, if contractors were sort of making sure the permits happen, for example, that would let the world know that there's a project in that location.

How do we sort of create the environment where that contractor feels like they need to do that? You know, how can we sort of link up the permitting data with the equipment data and sort of begin to highlight the mismatches between that? There are a number of things we could do to improve in that direction, and so just want to want to make sure everyone knows that we're planning to work on that in earnest.

But thanks, Nehemiah. You've played a big role in that.

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

Next we have Christopher Ruch. Christopher, please state your name and affiliation, and for the record spell your last name.

MR. RUCH: Sure. It's Christopher Ruch. Last name is R-U-C-H, and I'm with NEMI.

Commissioner, I do appreciate you bringing up the part about the permits. I think that is an issue to address, and I think a lot of us would like to help the CEC on that.

But I did have a very specific question going back a day to 140.4(a)3, and this is page 381 out of 758 out of the 45-day language. So this is 140.4(a)3. This was the part where there was a lot of discussion about multizones and school buildings and the minimums for these. My question is that, it was, there was a slide and it was also stated by staff that there was a size limit for the school buildings. Like, it was only the very largest school buildings that would have to do this multizone. And I was just having trouble finding that, where it was stating that it was only buildings of a certain size. I could see single-zone, and then I could see multizone, but it looked like, if it's a school building that's a multizone, it would follow under those rules. And I was just wondering if you could point out what I'm missing.

MR. TSAN: This is Bach Tsan with the California Commission. So there was one of the slides that just shows the large school buildings, and this is for square footage of 150 and above for Large Schools to apply to. I guess we

will have to clarify that, but basically you look at the section before, that's from the 2022 Code cycle, that it's every -- it's covered in -- it's multizone buildings that's not covered in 140.4(a)2.

Does that help?

MR. RUCH: Yeah it might help.

MR. TSAN: If you submit a comment, I'll clarify.

MR. RUCH: Yeah. I'll submit a comment, but it also might help to just clarify it, because if I'm having trouble, others might have trouble.

MR. TSAN: Understood. Thank you.

MR. RUCH: Thank you.

MR. BOZORGCHAMI: Thank you, Bach.

Gina, go ahead.

MS. RODDA: Gina Griffiths Radda. I'm not going to spell it again. Gabel Energy.

It doesn't say certain sizes of school and office. It really is, it's single-zone or it's multizone. I think what Bach was referring to yesterday is the case prototype buildings that were used to research the cost-effectiveness of this particular measure.

MR. BOZORGCHAMI: That is correct. That is correct, Gina.

Commissioner, I don't see any more raised hands.

COMMISSIONER MCALLISTER: Great.

MR. BOZORGCHAMI: I don't see any comments in the chat.

So I'm going to conclude these workshops, and I encourage folks to submit their comments to the docket. Right there is the link. Hoping people do it before May 13th, and give us enough time to really look into these comments, and get a proper response. If you do need assistance in docketing, or if you need assistance in other parts of Title 24, or even other sections of what the California Energy Commission does, Mona Badie, our Public Advisor, is more than happy to help you and assist you. Her website is right there -- her email is right there, excuse me. Her phone number, and the website to the Public Advisor's office is right there, too.

COMMISSIONER MCALLISTER: Great.

MR. BOZORGCHAMI: Do we -- are you okay to conclude today's?

Oh, we do have -- I'm sorry.

COMMISSIONER MCALLISTER: Oh. Okay.

MR. BOZORGCHAMI: I did get one raised hand coming in. I apologize.

Karen, go ahead and state your name and affiliation and spell your last name.

MS. BRAGG: Hi. My name is Karen Bragg. Last name is B-R-A-G-G. I am affiliated with the U.S. Green

Building Council, and sorry for the hesitation in asking my question. And I wasn't quite sure how to ask this.

But I also have been a LEED Green Rater for the past seven years in Southern California, and have a lot of experience looking at, like, mid-rise multifamily low-income housing. And in that vein, I know how important, like, field verification and enforcement are. So if -- thinking if we want this new Code to really have the impact that we need, that, really, enforcement and verification are really important. And my guess is, local jurisdictions, everyone's going to have a hard time just ramping up and adjusting to what's required here, and I don't know what role the CEC has if any in helping to regulate or guide how the Code is enforced. But would there be -- I mean, knowing that a program like LEED or other green building programs have a structure and method of, like, being in the field and verifying things, would third-party green building programs be considered as maybe an alternate compliance path for some of these issues?

Yeah. I don't know if you're in a position to answer that question, or -- but yeah, it could help fill in a gap, at least as this Code, the Codes change and come out, it could help fill in the gap for field verifications.

MR. BOZORGCHAMI: Sure.

So I can tell you right now that the Energy

Commission has a program, the Outreach and Implementation that's being managed by -- or supervised by Chris Olvera, within our branch, in our efficiency, that is out there on a daily basis, almost, providing training to the local jurisdictions, and manufacturers, and so forth. There's also the Energy Code ACE program that we have funded through the utilities, that's been really adamantly assisting the Energy Commission in providing information, training, methods of filling out documents, and actually doing enforcement. And then the utilities themselves also have training programs and classes through PG&E and Sacramento Municipal Utility Districts.

I don't know why your organization could not be out there providing assistance either.

I have one member of the Energy Commission. Charles, do you want to --

MR. OPFERMAN: Sure. my name is Charles Opferman, spelled O-P-F-E-R-M-A-N. I just want to point out that we also have a workshop on April 30th taking a look at the whole-house rating system beginning, and taking a look at the various rating systems that exist, looking at single-family and residential.

And if you wish to participate in that, that one starts at nine o'clock in the morning. It's on the CEC website calendar.

MR. BOZORGCHAMI: That notice is out for that one, Charles?

MR. OPFERMAN: The notice is out.

MR. BOZORGCHAMI: Okay. Wonderful.

So Karen, there you go.

MS. BRAGG: Great. Thank you.

MR. BOZORGCHAMI: I recommend you get involved with that program.

COMMISSIONER MCALLISTER: I'll reiterate. That's a great opportunity.

We are really planning to create a rating system that has -- sort of has traction out there, and that you, know is, highly understandable by regular people, and so really excited about that opportunity. There -- we're drawing from programs across the globe, actually, as models that we can perhaps, you know, inform our program with, and so I think it's a great opportunity for LEED and USGBC and, you know, the other rating systems that are out there to sort of cross-pollinate and figure out how we can do something really solid in California.

And then I also wanted to just say, I complimented staff, appropriately. I feel like I kind of left out legal. Our legal department in the Commission is really a key piece of this whole process, and they really do help guide the activities of the Code update from the

outset. And they're just -- it's way more complicated than I think anybody in this context would really be able to appreciate. A lot of it's behind the scenes, and just helping navigate, you know, the state requirements process, which can be quite complicated, and navigating federal law as well, those constraints around what a State Energy Code can do. And so really just want to appreciate Mike Murza, and the rest of legal who have been with us the whole way.

MR. BOZORGCHAMI: Indeed. Thank you, Commissioner.

We'll take one more raised hand and then we're going to wrap it up.

Carol, go ahead and state your name and affiliation.

MS. ROBERTS: Hi. Carol Roberts, g.r.e.g. Consulting. Can you hear me this time?

MR. BOZORGCHAMI: Perfect.

MS. ROBERTS: I fixed a setting. I'm so sorry.

I don't know if you are prepared or not to expand on, I missed the first part of that conversation on a rating system for California.

MR. BOZORGCHAMI: Charles, can you respond?

MR. OPFERMAN: Once again, I'm Charles Opferman, O-P-F-E-R-M-A-N, CEC.

No, the whole-house, I'll skip the history and

just let -- there's the original whole-house rating program is being re-envisioned. We are starting workshops as part of a public engagement process, and the first workshop on this is April 30th at 9 a.m. Once again, go to the CEC webpage, and it's in the calendar.

MS. ROBERTS: Okay. And the reach of this whole house rating program is for existing homes and retrofit?

MR. OPFERMAN: Yes.

MS. ROBERTS: Okay.

I just want to add one last comment to your points made earlier, Karen. Good news is we've got more HERS rating in mid-rise and high-rise buildings than we used to, and our blower door air infiltration rates are equal to the LEED minimum requirements. We've come a long way in getting a HERS rater in the rest of that building, and it is helping, but we're not getting in those high-rise buildings, or over three stories is a QII.

As a consultant and a rating entity here, we also do the QII inspection even on a high-rise because we want them to pass the blower door. It is instrumental in a supply-only situation or exhaust-only situation where you have a blower door mandatory. So again, anything Code-related to help support us get those third-party verifications out there, they do help.

Thank you.

MR. BOZORGCHAMI: Thank you, Carol. I think with that, this concludes the third Commissioner Hearing for this, for the 2025 Energy Codes.

Next, our staff will be working on comments and reviewing comments with our case team and legal team. And the sooner we get the comments into the docket, the sooner we can review those and provide a proper language for the 15-day. Then we're hoping to release the 15-day language in sometimes in June. So, really, seems like a long time. We don't have that much time.

So with that, thank you for your time, and have a nice rest of the afternoon.

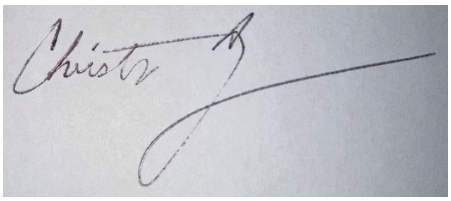
(The hearing adjourned at 2:33 p.m.)

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.



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Electronic Reporter
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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