DOCKETED

Docket Number:	17-BSTD-01
Project Title:	2019 Building Energy Efficiency Standards PreRulemaking
TN #:	221184
Document Title:	Transcript of 08/30/2017 Prerulemaking Workshop for the 2019 CalGREEN Voluntary Building Energy Efficiency Standards
Description:	N/A
Filer:	Cody Goldthrite
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	9/15/2017 1:10:11 PM
Docketed Date:	9/15/2017

BEFORE THE

CALIFORNIA ENERGY COMMISSION

In the Matter of:	)	
	)	Docket No. 17-BSTD-01
2019 Building Energy	)	
Efficiency Standards	)	
PreRulemaking	)	
_____	)	

2019 CalGREEN VOLUNTARY BUILDING

ENERGY EFFICIENCY STANDARDS

CALIFORNIA ENERGY COMMISSION

ART ROSENFELD HEARING ROOM – FIRST FLOOR

1516 NINTH STREET

SACRAMENTO, CALIFORNIA

WEDNESDAY, AUGUST 30, 2017

9:03 A.M.

Reported by:
Peter Petty

APPEARANCES

ENERGY COMMISSION STAFF

Christopher Meyer, Manager, Building Standards Office

Ingrid Neumann, Building Standards Office, Local Ordinances

Bill Pennington, Deputy Division Chief, Efficiency and Renewable Energy Division

Michael Shewmaker, Energy Analyst

Maziar Shirakh, Technical Lead for ZNE

Peter Strait, Supervisor, Standards Development

ALSO PRESENT

Robert Raymer, California Building Industry Association

Gregory C. Mahoney, City of Davis, Representing CALBO

Joseph H. Cain, SEIA

Kelly Cunningham, PG&E

Pierre Delforge, NRDC (Via WebEx)

George Nesbitt, Independent HERS Rater (Via WebEx)

John McHugh, McHugh Energy (Via WebEx)

Jim Elelson, NBI (Via WebEx)

Emily Withers, Department of Housing & Community Development

Tanya Hernandez, Acuity Brands (Via WebEx)

INDEX

P R O C E E D I N G S

AUGUST 30, 2017 9:03 A.M.

MR. MEYER: Okay, welcome everyone. My name's Christopher Meyer. I'm the Manager of the Building Standards Office at the California Energy Commission.

This is our prerulemaking workshop for the California Building Energy Efficiency Standards. And this one, we're basically going to focus on a few different things. You know, both, we'll have Mazi and Ingrid up here giving some presentations.

So, I'm going to just, you know, keep this very quick because I'm looking out and I think most of you have heard this spiel before so we'll just keep it fairly short.

Restroom locations, just right outside the door to your right. The snack bar is on the second floor so just feel to, you know, go up there. If you start going beyond that, you know, people will sort of usher you back.

If we have an emergency, just look to one of the Energy Commission staff, follow us, and we'll just go to the Roosevelt Park which is kiddie-corner across from the Energy Commission.

But the Energy Commission staff will make sure everyone knows where to go. My staff are not allowed to run first out of the building so --

So, basically, today I'm not going to go through a lot of the background stuff because that will be covered in both Mazi and Ingrid's. And I think most of you are familiar with how we develop it. But, very simply, it's like this prerulemaking process is really essential to the Energy Commission's process because we're very concerned about having an open, transparent process.

And what we never want to have happen is a bunch of different stakeholders give us things on sort of the side and then we go back into a dark room and make decisions on the standards. We want to make sure that all of those discussions happen in a public forum so that not only stakeholders can see what our concerns are, what our questions or what our proposals are, but we want you to hear each other's.

So, we definitely encourage everyone, who's joined us in the room or on the phone, to express your questions/concerns at this time so that your fellow stakeholders can be cognizant of

what your concerns are. And, hopefully, you know, there might be people outside of the Commission staff that have some good ideas, some ideas that might address your concerns.

So, anyway, today Mazi is going to talk about some of the EDR scores for the California Green Building Standards Part 11.

For those of you who are not familiar, their energy design rating is similar to the RESNET scores of 2006. A standard house rates at about 100. And the ZNE house that people are talking about would be a zero on the EDR score.

And then, Ingrid Neumann -- Neumann, sorry. She'll be talking about the California Green Building Standard measures that we're proposing for this one.

And what we're going to do, just so we keep things going smoothly, is we'll wait for the end of each of the presentations before we take questions, just so the presenters can just sort of get through things smoothly.

So, we'll stop after Mazi's presentation for any questions/comments, and then we'll go in with Ingrid's. And we should be able to get through this, this morning, without any problem.

I don't see this as being a very long presentation.

This is the schedule. So, for those not familiar, we're in the process here of going through the prerulemaking workshops. And the next thing is we're going to try to get our express terms out so staff is working to sort of finish that up, you know, actually this week so that we can start reviewing those internally, and get those out in September.

And then, we'll start the 45-day language hearings in December.

And, you know, it's not too far away, but on March 1st, 2018 will be the adoption of the standards.

As always, we try to get those things out as early as possible to give everyone in the building industry, and then the inspectors, time to get used to this thing. And then we start rallying the troops in trying to get all of the software, manuals, tools, all of that updated to reflect any of the changes.

And so, that will take us down ultimately to the effective date of 2020.

So, the schedule here, it's like you can

sort of see these are all things we've done already for the different prerulemaking. And we're actually down here at the very bottom of the last cell at August 30th, the CalGREEN Part 11 proposal.

So, sort of as you can imagine, you know, we leave this to the last because anything else that may have problems, drop off, other topics this is a good place to, instead of abandoning things just to put them here, if they weren't feasible, cost effective for the Part 6.

So, at that point, for those who aren't familiar, we have several web pages here that -- actually, there's several links that will take you to additional information and where to make comments. All of this stuff will be up on the web tomorrow.

But, actually, this information here is already on the web from previous introductions. But the presentations you'll hear today from Mazi and Ingrid will be up in the next couple of days.

And this just gives you an idea of some of the key contacts. Mazi, who's our technical lead for ZNE. Payam, the project manager of the 2019 update. Larry is our software lead. Peter

Strait, supervisor for the Standards Development Unit. Myself, Christopher Meyer and this is my contact. And Todd Farris, the supervisor of the Tools Development Unit.

So, please, don't hesitate to contact any of us with questions/comments. And if you have anything, just to make sure you get your comments in.

And we also do encourage, if you have more complex technical comments, questions or concerns putting those in writing helps ensure that staff get your comments down correctly and can address them fully.

Just a final note, before I turn this over to Mazi, is if you want to come up and make a comment just make sure that you get a card, or your information to the recorder so that he can accurately put your information down on the record.

Thank you very much. I'll turn this over to Mazi.

MR. SHIRAKH: Thank you. Good morning. I'm Mazi Shirakh. I'm going to talk about the role of EDR in the upcoming CalGREEN. But I'm also going to go a little bit beyond that and

talk about kind of a different approach for 2019 CalGREEN, which is somewhat different than the existing 2016.

Those of you who were here last week, some of these slides may be familiar to you because, you know, we did talk about CalGREEN as part of the presentation. But there's definitely new material here that's specific to today's conversation.

So, there's two parts to this. I'm going to be talking about a proposed ZNE strategy for both Parts 6 and 11, and also show you some of the capabilities of the CBECC software that we've developed for both Part 6 and 11. And I think Bruce Wilcox is also on the phone and if there are any questions, you know, we can answer your questions.

First off, you know, we've set ourselves seven goals as part of the 2019 Standards. The first one is to increase building energy efficiency cost effectively.

The second part is to make progress towards ZNE, as possible within the confines of the NEM and lifecycle costing. You know, ZNE is the goal, NEM is the law. So, basically, that's

a defining factor for us.

That's also recognizing that the Part 6, the basic standard is an important tool towards the ZNE goal, but it's not the only tool. So, we need to rely on other tools to get to EDR score of zero.

We'll be contributing to the State's GHG reduction goals. We're going to be promoting self-technologies and practices that encourages self-utilization of the PV generation and minimizing exports to the grid. And these would be called grid harmonization strategies.

We're going to be providing independent compliance path for both in all-electric homes and mixed-fuel homes. And we'd like to do all of these making sure that it's cost effective from the homeowner's perspective.

And the seventh point, which is probably very related to today's topic is provide tools for local governments to adopt the ordinances to achieve ZNE through Part 11. So, you know, we think we're on our way to accomplish all these goals.

So, we'll be talking probably quite a bit about grid harmonization strategies as part of

the 2019 Standards, both Part 6 and Part 11. And we think these are necessary because that's what brings the maximum benefit to the grid, to the environment and the homeowner.

And the way we define grid harmonization strategies are those measures that maximize the self-utilization of the solar output and minimize exports back to the grid.

Examples may be battery storage, thermal storage, demand response, and EV integration, especially for nonresidential buildings.

The strategy for the 2019 Standards, the priority is first envelope efficiency. Second would be an appropriately sized PV system, and I'll describe what that is in a minute. And then, third is to encourage grid harmonization strategies.

So, the standards and the PV sizing, for Part 6 we're proposing a PV size that is just large enough to net out the annual kilowatt hour usage of the house. And this is based on a mixed-fuel home.

So, the PV will be sized in each climate zone to basically net out the annual kilowatt hours and not the natural gas. And we also are

going to be recommending the same PV size for both mixed-fuel and all-electric homes.

For Part 11, the CBECC will allow a PV array to exceed that size if the PV array is coupled with battery storage of at least 6 kilowatt hours. And this over-sizing is allowed up to a factor of 1.6.

Why 1.6? First, it provides -- because the PV system is coupled with the battery storage it provides additional flexibility to the grid. It can basically help the grid meet its critical peak demand needs.

Again, the battery will also help promote self-utilization of the output and basically minimize exports back to the grid.

And also, the 1.6 factor, the cap ensures a PV size that will still be cost effective from the homeowner's perspective. That it will have a benefit-to-cost ratio that's greater than 1.0.

I went through this extensively last week. I went through a whole series of slides that was prepared by E3. I'm not going to go through that again, unless somebody wants me to. I have the slides in the back.

So, we're switching to an EDR metric for

2019 Standards, for both Part 6 and 11. So, what is EDR? Energy Design Rating uses a reference building. And in this case it's a 2006 IECC compliant building. And if we build a building that is just as good or as bad as that building, we'll get an EDR score of 100.

So, ZNE by definition, then, is EDR score of zero. And for 2016 Standards, our EDR score is in mid-50s. With 2019 Standards, you know, with enhancement to the efficiency measures, our efficiency EDR is going to be in the mid-40s. Adding the credit for the PV system, it will bring the EDR score to about mid-20s for most climate zones.

And again, the CBECC-Res has the capability to calculate these EDRs for both energy efficiency and PV system. And you can download this software for free, from this website.

So, Energy Design Rating will have three components. There's an EDR level for energy efficiency, which is based on the 2019 prescriptive measures. And this EDR target can only be made using energy efficiency measures.

And then there's the second component is

an EDR contribution from the PV system that is sized to displace the home's annual kilowatt hours.

And then, when we combine the two together, you know, we end up with a final EDR score. And the building will have to basically pass the efficiency EDR and the final EDR in order to comply.

For the efficiency EDR we're proposing to enhance the high-performance attics from the current R-13 up to R-19.

The high-performance walls we're proposing to increase the efficiency from the current U-factor of .051 to this range of .043 and .046, and then we'll see where we land there.

A slight improvement in the windows' efficiency and also making QII a prescriptive requirement, and that's a big change.

And then, we'll establish an EDR based on these measures.

And then, we'll calculate the EDR of the PV system, again based on a size that displaces the annual kilowatt hours and then we'll combine these two together in one final EDR.

The advantages of EDR is that, you know,

we use certain prescriptive measures to calculate that EDR, but that's just a performance target. And it allows the builders to get to those targets using other measures and technologies.

For instance, they can use more energy efficiency and less PV to get to the same target, or they can use things like high-performance glazing, Energy Star appliances, and higher than minimal HVAC systems. They can also use demand response and demand flexibility measures such as storage, and demand response measures, and other grid harmonization strategies that will help get to the same EDR targets.

And EDR target is fully compatible with the Reach Codes, which is the topic of the day. You know, the local governments can set various EDR targets and then the software will allow the builders and the architects to reach those targets.

This is a screen shot of the output screen from CBECC-Res. What you can see here is the EDR of energy efficiency. This is the EDR for energy efficiency that's proposed, that's the standard design. So, the proposed EDR of efficiency must be equal or less than this

number. In this case, this building is slightly better than the standard design so this one passes.

The second box, we have the EDR of minimum required PV, which is indicated in this box as 18 and a half. So, your proposed EDR of PV plus demand flexibility measures must be equal or greater than this. And in this case it is slightly better, so that's good.

And then, we'll combine the two together here in one final EDR and then the final EDR of the proposed design must also be equal or less than the proposed design.

So, for a building to pass we look at two numbers. This number, which is the proposed EDR, and this number that's the energy efficiency EDR, and in both cases the proposed design must be equal or less.

This is a departure from 2016 because we didn't have renewables. We're basically looking at energy efficiency, now, and it's a bit more involved.

And as I did last week, I'd like to kind of bring your attention to these numbers here. And this is important because what you see here

is that in our buildings, and this is a building in Climate Zone 12, Sacramento. And what you see here is that our loads are now pretty much dominated by plug loads and not by space heating, cooling or water heating systems.

The reason for this is that, you know, over the past 30 years I think we've done a great job of regulating or bringing down our regulated loads. So, it's all the plug loads that's basically dominating most of our buildings.

Parallel prescriptive paths for both mixed-fuel homes and all-electric homes. This allows, you know, all-electric and mixed-fuel homes to basically have their own path for compliance.

And there's a desire to have all-electric homes because all-electric homes are taking advantage of the greener resources such as, you know, the grid, and also the PV and grid harmonization can result in a much lower carbon footprint.

And for the all-electric homes, the NEIA Tier 3 heat pump water heaters is basically what needs to be used to establish equivalency between the two paths. And CBECC-Res is recognizing this

and will allow both paths.

So, again, this is recognition that electrification, when it's combined with PVs and demand flexibility, it can actually result in very small carbon footprint or GHG emissions from that house.

So, most of you have seen this slide before. Can extreme energy efficiency, regardless of cost, achieve full ZNE or EDR score of zero?

And again, as I mentioned, because our homes are pretty much dominated with electric homes, even if you eliminated all heating, and cooling, and hot water usage we still end up with an EDR score of about 25 to 30. And this is because, again, you know, our homes are dominated by plug loads.

The 2019 Standards, the efficiency EDRs are in the range of 43 to 48 depending on the climate zone. With practical energy efficiency measures this actually includes measures that are, you know, requires appliances higher than federal minimum. But if the builder chooses to use them, you can reduce these EDRs by about 7 to 9 EDR points, with the possible range of about 34

to 45 EDR range.

So, the conclusions are limited opportunities for regulators to lower EDRs in the future. And for any Reach Code that wants to substantially lower the EDR score, we must rely on PVs and demand flexibility to reach those targets.

So, the 2016 Standards have efficiency EDRs in the mid-50s in most climate zones. So, 2016 CalGREEN has three tiers. A Tier 1 that's 15 percent better than Part 6. And then we have a Tier 2 that's 30 percent better than Part 6. And then we have a ZNE tier which basically results in an EDR score of zero.

For the 2019 Standards the final EDR score, including PV systems, is in the mid-20s as opposed to mid-50s.

So, there's probably no need or room to have three tiers anymore. Two tiers may be sufficient.

Again, this is our proposal and then we'd like to hear, you know, your feedback on it.

So, we think two tiers is all we need. A Tier 1 that will roughly get us halfway to the EDR score of zero. And this is established based

on a default battery control system and a PV sizing factor of 1.3 or less.

And then, a second tier would be EDR score of zero. And this is established based on advanced battery controls and a PV sizing factor of 1.4 or less.

So, these are again performance targets. Now, the builder may use a combination of PVs, efficiency measures including higher appliance efficiencies and demand flexibility to meet these target EDRs the most cost effective way that they can find.

And this is a note for the slides that's going to come up is that one EDR point is roughly equal to about 170-watt PV panel, about half a panel, basically. So, when we're talking about EDR of 11 versus 12, or 13, you know, that basically kind of gives you a perspective of what it is.

So, what this is here is an example of how target EDRs might look for different climate scenarios. In this column it has the climate zones, all 16 of them. This is the 2019 energy efficiency EDR. Again, as we talked about this, it's in a range of about 43 to 48.

This column is the Part 6 PV size in kilowatt for different climate zones. And again, if we use Climate Zone 12 as an example, we're talking about a 3.2 kilowatt system on a 2,700 square foot home. And I should say this is the 2,700 square foot prototype and this is a mixed-fuel home.

And once you add the contribution of this PV system, its EDR contribution, and subtract if from the efficiency, these are the target EDRs that will end up, which is mostly in kind of mid-20s. You know, sometimes higher, sometimes lower.

So, this is the Part 6 requirement. So, what I just described was for Tier 1. We basically get halfway to the EDR of zero. If you look at the EDR scores here, again most of them are kind of in mid-20s, about 23, 24, you know 22. A rough average is about an EDR score of 12.

So, we have a choice here, actually. This is one of my questions. We can look at these EDR scores and make it half exactly for each climate zone. Or, basically, since most of these are right around 22, 23, 21, 24, and just call it an EDR 12 just for simplicity sake.

Again, you know, one choice is to make this 11, this one 12, this one 13 and just go through that and come up with specific EDR targets for each climate zone or simplify it and call it all EDR score of 12.

And my recommendation is basically call it an EDR score of 12.

The outliers here are Climate Zone 1 and 16. And again, this is because these are much colder climate zones. This is a mixed-fuel home. A lot more natural gas in those climate zones, so those would be the outliers.

The 12 target for Tier 1 can be met rather easily with very small over-sizing factors. Most of the oversizing factors are going to be in this range between 1.0 and 1.2. So, a very modest oversizing factor is needed. And this is, again, based on basic battery controls.

So, the differences are the oversizing. This is 1.3, that's 1.2, 1.1, 1.0. So, what I did was this is the target EDR and I ran these numbers until basically I had 12 and then I stopped. It's a very time consuming effort, you know, trying to do as I just -- you know, for

time's sake when I hit my target I stopped, I didn't run all the scenarios.

But most of this 12 target can be reached around 1.1, 1.2. Some of them even with 1.0, which means no oversizing. Basically, you have to install a battery with default controls.

Again, this is the target. And if the builder wants to get to that 12 using other measures, they can.

Climate Zones 1 and 16 are the outliers, so it's going to have a higher target. The problem is actually going to be Climate Zone 16 because look at this oversizing factor here, it's a 1.8. It actually exceeds our 1.6. And this is going to get worse when we get to all-electric and I'll talk about that in a minute.

And then the Tier 2, obviously the target is going to be zero and that can be reached with advanced batteries and, again, an oversizing of about 1.4 or less.

And you look at the oversizing factors here for Tier 2, still pretty reasonable. I mean, you've got 1.4 in these climate zones. Most of them are around 1, 1.1. In this Climate Zone 7 I think it's actually a little bit less

than 1.

The problem is going to be Climate Zone 16. Climate Zone 3 is okay -- I mean, 1, at 1.3.

So, I mean this is 1.8 is with advanced batteries, still at 1.8. Again, it's a cold climate zone and lots of natural gas. And, you know, to try to net that out with PVs, even including advanced batteries it takes an effort.

So, the previous example was for the 2,700 mixed-fuel home. Here, I did the 2,100. I didn't do all 16 climate zones. Climate zones tend to basically have groups and, you know, they're similar. So, I picked a representative sample so I could get some sleep last night and I just ran those.

But the story is actually the same. If you look at it, the 12 target pretty much works. You need a very slight oversizing for the 12 target. Again, for Tier 2, we're talking about the same modest oversizing factors. It's actually a little bit easier for 2,100 square foot. Again, the outlier is going to be Climate Zone 16.

What about all-electric homes? Well, all-electric homes tend to use more electricity

so we tend to have, you know, bigger PV systems and because the electrical load is greater.

So, when we look at these target EDRs here instead of 12 for all-electric homes we need to have an EDR target of about 14, in recognizing of larger PV systems that are required.

But the oversizing factors are still pretty reasonable. I'll do this a little bit more aggressive than before.

And for Tier 1 the same, you know, it's no problem, but look at what happens to Climate Zone 16. Now, we need an oversizing factor of 2.5 instead of 1.8 before.

What's going on here? In this note, it may not actually be cost effective or practical to require EDR zero in Climate Zone 16, especially for all-electric homes because of the very cold climate there. When you put a heat pump, it's going to be running on electric resistance a lot, for both water heating and space heating.

So, it is what it is. This is also an indication of what might happen in, like if you have a national perspective, the colder states, north, will have probably the same issue.

So, half of 44 is about 22 and that would be the EDR target. To get to that 22 target we need an oversizing factor of 1.9.

And for Tier 2 compliance we need a PV size of about 8, which is an oversizing factor of 2.5.

So, other than Climate Zone 16, I think the rest of the climate zones are actually going to be fine for both all-electric and mixed-fuel homes.

This is a slide from last week and the reason I'm presenting it is to show that there's many different ways to get to an EDR target of zero. And what this is showing is that, again, looking at Climate Zone 12, you know, our base requirement is 3.1. You can actually get to an EDR target of zero employing more energy efficiency, advanced batteries without substantially oversizing your PV system, and still get to an EDR score of zero.

So, what this suggests is, you know, if you look at this carefully and strategically, you can get to your target EDRs with a system that actually costs less and it is fully grid harmonized.

You know, the difference between 3.5 and 7, it's about 3 and a half kilowatts. That's another $12,000. And even if you install a battery storage system you're still going to come out ahead, and you'll have a fully integrated or harmonized PV system that brings flexibility to the grid and all that. And you'll have the environmental benefits. And the homeowner can take advantage of time-of-use rates. So, I mean, that's the message for this.

So, I just have a few more slides. The software tools, as I mentioned CBECC-Res can be used for compliance for both Part 6 and 11. The software can be used to size the PV system for Part 6 and Part 11 to get to lower EDR scores.

It can evaluate the impact of battery storage on lowering EDR. It can assess the impacts of precooling and other DR strategies in lowering EDR. And it can also assess the impact of thermal storage, including heat pump water heater and demand response by making hot water in the middle of the day, and other options.

This is an input screen from CBECC-Res. This is the EDR PV tab. What you have down here is the proposed PV system that you're going to be

putting on the house. There's two choices here, there's a simplified and a detailed. If you have a complex PV system that faces multiple orientations, you'll want to use the detailed tab. Then, that allows you to basically specify the size and/or orientation of each array, individually.

If you have a very simple, single orientation PV system, then you'll specify the simplified approach.

What this tab also does, this is a really handy tool; it allows you to specify an EDR target. I mean all those tables that you saw that I developed with different EDR targets, this is what I used. Without this, I'd be here until the end of the month, probably, doing this.

So, you can specify your EDR target and the software will calculate what size PV system you need based on this EDR target and all the energy efficiency features, the type of batteries, the type of battery controls and all the other demand response projects that you have.

You'll specify all of those and then you put your EDR target, and it will calculate and it will tell you that you need this size PV system

to reach that target EDR. It's a very handy tool.

The only thing is when you check that box it really slows down the program because it has to run through the simulation two or three times. So, you only use it when you have to and then you want to uncheck it.

And what the software team has done is when you check that software, every time you want to run it, it gives you a warning to remind you that that box is checked. That way you don't sit there for three minutes, instead of your usual 45 seconds. So, use it when you have to, uncheck it when you don't need it.

This is the battery tab. You specify the battery capacity in kilowatt hours. You can specify what type of control system you have, whether it's a default battery or the best case. We're actually going to be adding more scenarios to these controls.

Wilcox is working on this. We just didn't have time to finish it in time. But it should be there, available, fairly quickly. So, we'll have more choices for this battery control, which is going to be based on a predictive

algorithm that will try to predict when the highest TDV hours are going to take place and the battery will only discharge during those hours which may not require an interaction with the utility. So, we'll add those to this.

And then you have to -- there's the round trip efficiency of the batteries and the charge/discharge rate in kilowatts.

And again, when you specify a battery storage system that's bigger than 6 kilowatt hours, then the software will allow you to oversize the PV system by a factor of 1.6 to meet those EDR targets.

This is under the building tab. There is a checkbox for precooling. That's another demand response measure that comes in handy. And this is a strategy that if you think about the 2019 Standards envelope, you know, we're going to be buildings with high-performance attics, high-performing walls, really nice windows, tight, you know, continuous insulation. So, we're building a thermos.

And you could precool the house right before the critical peak by several degrees and chances are even during hot days, like this, your

house can basically coast right through those hours without having to turn on the air conditioning system. So, there's a TDV advantage to that strategy, which this captures.

This is the output screen. And again, we talked about this. This is the standard design, that's the proposed design, and you're supposed to meet or beat the efficiency and the final EDR target in both cases.

This is the pass/fail sheet or screen. And this is the standard design for energy efficiency and this is for the final EDR. And your proposed design must be smaller than both those numbers in order to comply.

So, that is it. I'll be happy to answer any questions. Bob?

MR. RAYMER: Thank you, Mazi. Bob Raymer, with California Building Industry Association.

And a great presentation. When the locals go about moving to adopt a Reach Code, or whatever, there's always the interaction with the local BI and the other stakeholders. And I'm sure just, you know, since the beginning of time with Reach Codes cost will be an issue.

But having, for the first time, looked at this, the format that you're proposing we really like. We like the idea of perhaps moving to two, as opposed to the three sort of tiers that are out there. That provides a good level of simplicity.

We also like the other point that you're looking at adding some additional alternatives in CBECC for battery storage. That is definitely in our future. And for grid harmonization I suspect a lot of our higher end builders that are out there, not the entry level housing, but the higher end are definitely going to be from the onset looking at putting battery as a component of the house. I think probably in the third and fourth quarter of 2020 when massive compliance with the new regs starts kicking in.

So, all of this sort of works part and parcel together. And with the Reach Codes the way that you're proposing that's going to provide us with a lot of very good data as you go about adopting the 2023 regs, or the 2022 regs that take effect in 2023.

Clearly, you know, storage is going to be a more probably permanent factor in those regs,

than right now.

Having said all of that, I'd like to make three suggestions, rather minor requests here. Looking at the current format of your Part 11 regs, in the appendix, under Section A4201, that's the general section, we would request that at the bottom of this that you add a note to the language. A note, of course, very common usage by all the agencies. It doesn't contain building standards, per se, it contains helpful information.

And under your general and scope paragraph that you have here, it takes up about a third of the page, a third of a column, put in a note saying it's advisable for local jurisdictions considering adoption to bring the local utility, the regional reps from the utility into these discussions from the onset. So, from both the utility line extension provision and for, ultimately, the energizing of the system that's out there, now, that's going to contain renewables that they're part and parcel to this.

Now, with or without the note ultimately this will get implemented. The point here is it can sometimes take two or three months to get the

local regional utilities to contact the higher ups, you know, in the main office and that makes an original rollout of a new Reach Code, or whatever, a little bit bumpy.

And if they're simply involved from the onset, you know, some jurisdictions may not think -- they'll bring in the building department, of course, but they may not be bringing in the local utility because normally they haven't been all that involved with the local building code. So, that would be good.

In addition, just simply making a reference to the exclusions that you're going to be having in the Part 6 regulations can make sure that they understand that there's going to be certain circumstances that don't work out.

And lastly, I don't know what to do with Climate Zone 16. You know, whether or not you want to go with the numbers I've got to tell you over the last 20 years I don't know of a lot of Reach Codes that have been adopted for Climate Zone 16. There's not a lot of production housing. And I don't know if you just simply want to put an asterisk there saying, wow, these numbers really go out. We'll be open to

suggestions that you may have.

But those are the three suggestions we would suggest right now. We like the format that you're heading towards. So with that, thanks.

MR. SHIRAKH: So, one question about -- thank you for those comments. You may want to answer this now or later, what do you think about having a unified EDR target? Even though, you know, there may be deviations, slightly.

MR. RAYMER: We would prefer that. We would prefer a simplistic similar number. And the reason why I say that is once again, as the locals get in and they do the negotiations for this you'll find that a lot of local Reach Codes, they may pick and choose a couple of efficiency items that they specifically want to see for that particular jurisdiction.

You know, like some already put in QII, and some other HVAC stuff, or whatever. And with the renewable component here there may be some horse trading, or whatever, that goes on at the local level. But this would make it easier to understand. Instead of having 12.1 versus 11.9. And it makes it simpler to view. So, yeah, we would support the way you're headed.

MR. SHIRAKH: Okay, thank you, Bob.

Any other questions in the room? Greg, thank you.

MR. MAHONEY: Greg Mahoney, City of Davis, representing CALBO. And I also like the idea of having just the two tiers, rather than the three.

And in regards to the EDR rating, the Tier 1, I would say whenever you have an option between a detailed approach and a simplified approach you should choose the simplified approach just for easier compliance, better understanding.

MR. SHIRAKH: Are you also okay with having a unified EDR target?

MR. MAHONEY: Yes, absolutely. Yes, I am.

MR. SHIRAKH: And I guess it's going to be two-tier. Probably one for 16 and the rest of them, and one, the rest of them are going to be.

MR. MAHONEY: Yeah, I think the simplified approach is the better way to go.

MR. SHIRAKH: Okay. Thank you, Greg, appreciate it.

Any other comments in the room? Joe?

MR. CAIN: Joe Cain with the Solar Energy Industries Association. To answer the question that I know you're going to ask, I concur that the unified target is probably the best approach for simplicity.

The other thing that I just wanted to mention is that we're still not sold on the advanced controls of the batteries. So, you can expect that to again be in our public comment.

And that is if you make the Tier 2, or the full ZNE target of zero and --

MR. SHIRAKH: That would be Tier 2, yeah.

MR. CAIN: And with that require the advanced controls that's kind of a whole bundle of things that have some uncertainty around them.

And one of those is you mentioned that the discharge would only happen at optimized TDV. So, we still have the concern of a consumer purchases or owns a battery and does not have control over when it discharges. The utility may have control over when it discharges.

And so the question is, you know, optimized for whom? And so, a consumer might not want -- you know, might want more control over their own products that they own rather than, you

know, relinquishing control to the utility.

And we've heard some cases where some of these things can be voluntary, but I would be concerned about it being compulsory and part of a Green Code. So, that would be that thing that we would be concerned about.

MR. SHIRAKH: I think the homeowner would actually have a choice here. They can either opt for advanced controls and get to the EDR target with a smaller PV system, or they may choose to have a basic control where they can use it for backup power and so forth. But then they have to make up the difference with more efficiency or PV system. So, you know, we're not mandating this. It's basically a choice that the homeowners or the builders might have.

MR. CAIN: Didn't you say in the second tier it would require they have control?

MR. SHIRAKH: The second tier -- well, to get to, again to get to this target we have assumed advanced control.

MR. CAIN: Okay.

MR. SHIRAKH: But you can get to this target using other measures, too. You can go to basic control but you have to put in better air

conditioning systems. You have to employ precooling. You know, you can have better window. And, you know, you can make up that difference. So, it's the builder's choice, the homeowner's choice.

But what we established as benchmark assuming batteries with advanced controls.

Bill, did you want to add something to that?

MR. PENNINGTON: Yeah, I just wanted to understand Joe's comment. So, are you concerned about having advanced control battery control credit that would require utility control? Is that your concern?

MR. CAIN: Yes.

MR. PENNINGTON: So, you would rather not have that?

MR. CAIN: Well, I should also premise that there are others who are more technically up to speed on the full batteries and the power electronics. And I'm not a power electronics guy.

But in terms of the -- you know, the same issues that have come along with demand response, that have come along with smart inverters that

have come along. You know, we're seeing trending in that direction, but I don't know that we are there, yet, for batteries and how that power electronics would be developed, and how the signaling would be standardized. And so, there's a series of issues that come along with that.

MR. PENNINGTON: Okay. So, I'm hearing you having concern with utility control of the batteries. That is sort of the general idea.

MR. CAIN: Yes.

MR. PENNINGTON: And maybe you'll clarify that some more in your comments or something.

You also mentioned a concern, I was hearing, about assuming that the battery is accomplishing load shifting to avoid high TDV hours. And your argument was that you thought that consumers might want to do something different from that, I guess is what I heard.

I think in general the optimum situation, economically for the consumer would be avoiding the high TDV hours. And they're not going to match exactly a TOU rate, necessarily, but they're going to be pretty much coincident. So, they're actually pretty well lined up avoidance to maximizing the economic benefit of customers

that are on TOU. So, it doesn't seem like the economic concern would be there.

So, if there's some other concern, it would be good for us to understand what your concern is?

MR. CAIN: Well, that's where my question is going is the difference between TDV and the rate structures. And rate structures can be variable. TDV can -- well, that's where my question is going. And I could probably lean on some others who are experts in the power electronics to articulate a little further.

MR. MEYER: Yeah. No, this is Christopher Meyer with the Building Standards Office. I think that would be helpful in your written comments and then we'll sit down.

But initially, we're all sort of looking at sort of your basic battery controls and then we're thinking of a utility-controlled. And then we sort of looked and realized that there are advanced controls that don't require utility involvement.

But ultimately our thinking is in the future there may be utility control, but that would not be through the advanced controls of the

batteries. That would be through a separate tariff sort of similar to net energy metering. The thought in our minds would be that if utilities wanted to gain a benefit from the behind-the-meter storage that's owned by individual homeowners that would be through a tariff program, similar to net energy metering where, yes, the consumer -- the customer would lose some control of their battery, but it would be through a program that they would sign up for and they would get some sort of a compensation from that, from the utilities.

That's how we were thinking about that. Not having advanced controls, setting up a situation where in the future the utility could just, you know, actually influence those batteries without the customer's involvement, consent, you know, without some sort of remuneration to the owner of that system.

So, that's sort of what the basis of our thinking is because we don't want to set up a situation where someone invests in a battery system and then somewhere down the line, without their control, the utilities start messing with it.

And from talking to utilities, they have no intention of -- they don't want that. You know, if they enter into something where they need to use those behind-the-meter they want it in a tariff situation so everyone understands what the expectations are. And then, the utility can count on that behind-the-meter storage because it will be within a sort of -- similar to net energy metering. I mean, does that make sense?

MR. CAIN: Yeah, it does. But I think that the end result I would desire is for us to do a better job of articulating the question and just make sure there's clarity about what does advanced controls mean and what are these strategies that may be involved?

And, you know, are we going to need another standard for uniform signaling or, I mean like we did with Rule 21? I mean, there's a bundle of issues that land with the power electronics guys, so I'll drag in at least one of them.

MR. MEYER: Yeah, that would be helpful because it's understanding what your questions are on some of these terms. And this goes not

only for advanced batteries, but any of the sort of new terms that we're talking about for 2019, that we're sort of introducing. If we understand the questions that we're getting from all the stakeholders, it will help us when we're actually writing the definitions of those terms in the manuals, and other places. So that if we understand what the questions are, we can make sure that we're clear in those definitions so that we're all operating from sort of the same playbook. But, no, thank you very much that would be great.

MR. CAIN: Yeah, great.

MR. SHIRAKH: And just one note.

MR. CAIN: Yes.

MR. SHIRAKH: Is again, you know, I show here that we have two choices and it's called default and best case. We're going to be adding more choices. One of them, we may actually call it time-of-use control.

And this is going to be, basically, we're going to be looking at the TOU rates of IOUs and they generally happen between like 3:00 and 7:00. So, the battery will only discharge, starts discharging during those hours. And that does

not require any utility action or control.

MR. CAIN: That makes a lot of sense, yes.

MR. SHIRAKH: So, you know, give us your comments in detail and we'll look at it. You know, we're still developing this so it will be very helpful to understand exactly what your concerns are.

MR. CAIN: Okay, great.

MR. SHIRAKH: Thank you.

MR. CAIN: And we are, the CEIA is very supportive of the bundling of PV and storage, so we're glad to see the Commission going in those directions. Thank you.

MR. SHIRAKH: Thank you, Joe.

Bob?

MR. RAYMER: Yeah, Bob Raymer, CBIA again. Going right onto the point that you just made, sort of that -- I don't want to call it the midrange, but where the homeowner would have access to the tool that would help offset the time-of-use rate from 3:00 to 7:00.

In a comment that Brian Zimmerly from Tesla had given, the concern of a couple weeks back was whether or not when you say

optimization, because they don't see all this stuff written out, yet, so they're just guessing. And, of course, as we guess, you know, as stakeholders, we tend to assume the worst.

And the concern was when you say storage optimization and usage are you talking about optimizing it for the utility purposes or optimizing it for the homeowner. And, obviously, the homeowner would love to have the ability to have that battery discharge within the house during 3:00 to 7:00 p.m. so that they offset those time-of-use, you know, those two to two and a half time rates normally.

And so what you just described, that new thing that you're adding to CBECC or whatever, seems to directly deal with that issue and that's going to be great.

MR. SHIRAKH: And I actually have two here. One is called TOU-controlled strategies and the other one is called TDV. So, TDV would be from a utility's perspective and TOU would be from the homeowner's perspective.

MR. RAYMER: The homeowner, which is perfect.

MR. SHIRAKH: And the chances are the two

may actually end up having the same result because --

MR. RAYMER: Yeah, as Bill said, it's you're going to have a coincident, you know --

MR. SHIRAKH: Cast a net that's wide enough and then you're going to cast all the big fish. And with 14 kilowatt hours, if you start discharging at 4:00 chances are you are actually going to go through the whole four hours, you know, using the battery.

MR. RAYMER: Wow, yeah.

MR. SHIRAKH: Which will basically satisfy both the homeowners and the grid, we'll see. I mean, Bruce Wilcox, we need those. So, and he's working on it.

MR. RAYMER: Tell Bruce to get on it now and get done. So, anyway, thank you.

MR. SHIRAKH: Sure.

Kelly?

MS. CUNNINGHAM: Kelly Cunningham, PG&E. Just making a few comments to follow up on your discussion. The utilities are encouraging the exploration of what advanced controls is and also hopes that the Energy Commission will put out supporting documentation that will show what the

thinking is behind this, what these features might entail. This will help defeat some of the myths that are already starting to bubble up or misunderstandings around what advanced control will entail.

And something that was said about we don't know, yet, about what will be used, how it will be used, but we do believe that this direction will benefit the homeowner and that's important to note.

And the utilities will be making comments on this topic, as a follow up to last week's meeting, on August 22nd. But in general, advanced control does mean, we think, the greatest potential for options for the homeowner and for the best use of these technologies. So, just a reinforcing note for that, thanks.

MR. SHIRAKH: Thank you, Kelly.

Any other comments inside the room? Any comments online?

MR. SHEWMAKER: We've got a few questions online. The first is a question from Amy Dryden, asking if you could define basic battery controls versus advanced batteries. I think this is related to slide 18.

MR. SHIRAKH: So, what was the question?

MR. SHEWMAKER: If you could define basic battery controls versus advanced battery controls?

MR. SHIRAKH: That's what we were just talking about the last ten minutes. It's basically when you specify a battery currently you have two choices. One is called default or basic control. And what this is, is a very basic algorithm where the battery will get charged from the PV system any time the generation is greater than load.

And then, as the sun starts going down and gets warmer as soon as it flips and the load becomes greater than generation, the battery will start discharging regardless of what time it is.

So, this could happen at 2:00 in the afternoon, or 3:00, or 4:00. It really depends on when that transition takes place.

There are several advanced control strategies and all of them are variation of the same concept. That you don't necessarily start discharging the batteries when the load becomes greater than generation, rather you hold it back until some hours later when you have either the

highest TOU rates or TDV rates. And so, that would be the definition of advanced controls.

MR. SHEWMAKER: Then next we've got a comment from Pierre Delforge. Pierre, I'm going to go ahead and unmute you, now.

MR. DELFORGE: Yes, good morning. Can you hear me?

MR. SHEWMAKER: Yeah, if you could just state your name and affiliation?

MR. DELFORGE: This is Pierre Delforge from NRDC.

MR. SHEWMAKER: Go ahead.

MR. DELFORGE: I'm getting an echo. Is it okay on your side?

MR. SHIRAKH: There's a little bit of an echo, yeah.

MR. DELFORGE: Okay, let me see if I can tweak with my mic.

MR. SHIRAKH: We can hear you, though.

MR. DELFORGE: Okay, let me go ahead. So, first, I'd like to thank the Commission for hosting this workshop and for Part 11. It's important for local leadership and for setting the stage for potential prescriptive measure in the code cycle.

I've got an echo and it's still hard to speak. I think I'm just going to send in written comments. I don't think I can carry on like this. My apologies.

MR. SHIRAKH: Yeah, that would be good. We're having a little bit of a hard time understanding you. You sound like you're talking from a basement.

So, would appreciate it if you send your comments in writing.

MR. DELFORGE: I will do that, thank you.

MR. SHIRAKH: Thank you, Pierre.

MR. SHEWMAKER: All right, next is George Nesbitt. George, I'm going to unmute. If you could state your name and affiliation?

MR. NESBITT: Yes, George Nesbitt, HERS Rater. Can you hear me?

MR. SHIRAKH: Yes, we can. Thank you.

MR. NESBITT: The first thing, unfortunately the Energy Commission scheduled both the CalGREEN and an NSHP Guidebook meeting at the same time today. Which, you know, there's actually a high degree of overlap and interest. So, unfortunately, I can't be in two places at once.

But my first concern about the CalGREEN would be the situation of whether complying with Part 6 let's say you have to have a PV system of size X, or whether for Part 11 let's just say there's two tiers, so X plus one and X plus two.

What happens when the builder or the homeowner buys the system, installs the system, and goes to interconnect and the utility says, I'm sorry but your system is too big we will not connect it.

What's going to happen? They're going to have to modify their system to be smaller or they're going to have to lie to justify the size of the system.

The PG&E Net Metering applications limit you to 1.1 times your recent use. Now, on a new home I suppose you can justify what your estimated use is.

I'm also concerned that our software potentially grossly overestimates use. I have a number of projects, quality-built projects. One, the first net zero energy new single-family home that I certified in the State of California. It used less electricity than predicted.

Another Passive House project, all

electric, used something like half the predicted electric use. So, we're basing system sizing off of potentially an estimate that it too large. And by sizing to 100 percent of the electrical use we are going to require a system that is not legally allowed to be installed.

Traditionally, solar companies have sized systems at approximately, I think, 80 percent of electrical consumption. And that's because that's roughly where you've maxed out the economic benefit. And Net Metering 2.0 changed that equation a little bit, but not a lot.

So then the other thing is the battery storage. Well, currently I think NSave, their storage system I think only allows two different types of control. And it's probably no net export.

Also, then, the other option I think is to maximize self-consumption. And I'm not sure to what extent the net metering rules dictate those types of things.

So, I'd be concerned about allowing options that A, don't exist in the physical equipment or that are not allowed under the rules, which sort of all of this in -- you know,

a consistent problem we have is the difference between what people say they're going to do to meet the standards and what people actually do.

And so, we should not be building things into the standards that say you're going to do something that you can't do. It's just not acceptable.

And that's the end of my comments for now.

MR. SHIRAKH: Thank you, George.

Any other comments online?

MR. SHEWMAKER: Yeah, we've got another comment online. This one is from Jon McHugh.

MR. SHIRAKH: Good morning, Jon. Hi.

MR. SHEWMAKER: You're unmuted now, if you could state your name and affiliation?

MR. MCHUGH: Good morning. This is Jon McHugh with McHugh Energy. And this comment's in response to I think comments that I've heard from Bob Raymer in the past, which have to do with liability associated with calling something ZNE.

And I think it's highly desirable that Tier 2, that we may want to call it Tier 2, but I think in addition we want to say that this is the CalGREEN-defined ZNE tier, so that we actually

assist builders who want to market their product as being defined by the State as ZNE. And so, if someone goes to court and says, you know, as George brought up people's consumption varies by individual people.

But for marketing someone can say, hey, this building is designed and built according to the requirements of the ZNE tier in CalGREEN. I think that's helpful for the market, but it would be good to also hear Bob's comments on this. Thank you.

MR. SHIRAKH: Bob says he agrees. And also, if you notice in my presentation, I didn't use the word "ZNE" a lot. I used the word EDR Zero in recognition of that problem.

I mean, in none of these tables you see ZNE tier. It just basically says Tier 2 is EDR score of zero.

MR. MCHUGH: Yeah. And Mazi, I'm thinking that desirable -- I mean, ideally why we have this EDR Zero tier is to better define. You know, to some extent the value of ZNE is diluted or weakened if there's multiple definitions.

And for the State to say, well, this is what we're calling ZNE. Other people can call it

other things. Department of Energy can call it something.

But in terms of I've got a builder in Sacramento, another builder across town or whatever, and they're both calling their thing ZNE, I think that there's some cachet to I'm building a ZNE building in accordance with the CalGREEN definition.

And so, it would just be good to kind of get some feedback about whether we try to, you know, pull away from using the term ZNE. There's so much -- you know, there's conferences left and right. There's various organizations. There's a reason why there's all this effort. I think it, you know, has spurred people's imagination around low-energy housing and building. And so, I'd just be interested to hear if it's actually desirable to no longer use the term ZNE at all in this advanced standard? Thanks.

MR. SHIRAKH: I think we agree. And you actually convinced Bob to come to the podium.

MR. RAYMER: Yeah, this is Bob Raymer with CBIA. I agree with both Jon and Mazi. We like the idea in particular to specify when we use the term ZNE, if we use the term ZNE, that we

effectively reference CalGREEN for one.

But more importantly, as Mazi said, we'll be focusing on EDR. That's sort of the future of the regs for both efficiency and renewables/storage. So, I think that keeps things in sort of a level of commonality here. So, we agree with both of you.

MR. SHIRAKH: Thank you, Bob.

Bill Pennington has a comment.

MR. PENNINGTON: Yeah, so the Energy Commission anticipated this issue in the 2015 IEPR, or earlier IEPRs, and was careful to use the term "ZNE code building" instead of this global ZNE thing.

I mean, it seems like -- I like the idea of maybe avoiding the use of the term. However, the whole world wants to talk about the term. And so, maybe we need to do a little bit of both. Maybe we need to characterize it as an EDR Zero building, but call it a ZNE Code building, you know, to use the ZNE vernacular. And maybe that could be defined in Part 11.

MR. SHIRAKH: Thank you, Bill.

Any other comments online?

MR. SHEWMAKER: Yeah, if we could circle

back to Pierre, he has switched out his microphone and would like to make a comment.

Pierre, you're now unmuted.

MR. SHIRAKH: Your new microphone is not working, Pierre.

MR. SHEWMAKER: All right. Well, we've got one other comment from Jim Elelson. Jim, I'm going to go ahead and unmute you, now. If you could state your name and affiliation?

MR. ELELSON: Yeah, hi Mazi. This is Jim Elelson from New Buildings Institute.

MR. SHIRAKH: Hi Jim.

MR. ELELSON: And, yeah, we'd really like this zero net energy reference to be consistent because we're going to be working nationally where ZNE for residential hopefully will be recognized for -- mostly for HERS ratings equal to zero.

So, to make that distinction in the California market I think would be really helpful, the difference between getting ready for ZNE or ZNE Code, and then what is a ZNE building that's actually designed to achieve ZNE?

So, that's our perspective nationally.

MR. SHIRAKH: So, you know, what do you

think about using the EDR Zero, rather than reference to ZNE?

You know, my concern is even if you call it ZNE Code, or anything else, as long as the word "Z" is in there, the customers won't be able to distinguish that between just regular ZNE. Their expectation might be, you know, it's going to be no electricity, no bills.

MR. ELELSON: Yeah. I mean, yeah, EDR equals zero. That, essentially, would be the equivalent of a ZNE. So, in some sense they could be synonymous.

MR. MEYER: Jim, this is Christopher. Are you guys, when you're looking at a national standard are you working with the Department of Energy on sort of the zero energy ready or, you know, are you guys working with them on sort of that definition?

Or, are you looking at a national ZNE definition? Because I know the DOE had their Zero Energy Ready Home Program, where they were looking at a different one. Because they, I think, recognized that concern of improperly messaging to people that -- you know, as George sort of pointed out, you can have a house that

models to ZNE, but you don't actually end up with the same benefit because of behavior on the house, and the different people living in it.

So, I was just wondering what your thought on that was?

MR. ELELSON: Yeah, so those are distinct for us. The Zero Energy Ready home is not what we're really looking towards.

We are more interested in the zero energy building definition that was released out of the Department of Energy which is a measured zero net energy level.

What we are talking now with -- we're now, in talking with HERS about how to standardize their definition of zero net energy. And we think it's going to be the HERS equals zero, equals a zero net energy asset type rating, and then there will be some particular zero net energy certification once there is, you know, 12 months' of building data.

So, you know, we are more concerned with the zero energy building definition of DOE, than their Zero Energy Ready Home Program.

MR. SHIRAKH: Bill?

MR. ELELSON: Does that answer your

question?

MR. MEYER: Yes, thank you.

MR. PENNINGTON: So, this issue of comparing builds to a design expectation is inevitable to be a problem or a -- I don't know if I want to call it a problem. It's a reality that's inevitable, that you always are going to have to be explaining yourself. And it doesn't even help to have the first occupants of the building achieve ZNE through their behavior because over the life of the home you're going to have lots and lots of different families with radically different behaviors. Potentially, whose bill gets to zero or doesn't get to zero as a result of, you know, whether the kids move back in with them or, you know, they've got a bunch of teenagers, or whatever is driving it.

So, the communication question is inevitable as long as you try to describe a design characteristic or an asset characteristic.

And so, I don't think we can avoid it. I don't think we can sort of ignore it and talk our way out of it. I just think we're going to have to be careful about how to do the messaging. Particularly with the cachet of trying to get to

zero net energy as being a driver, I think there's real value to associating with that interest. And I think that is a stronger motivation than trying to avoid this communication problem that I think is always there.

So, anyway, that's my opinion.

MR. SHIRAKH: Thank you, Bill.

Any other comments online? Joe, did you have a comment?

MR. CAIN: Joe Cain, with CEIA. Sure, on this discussion right now, some of the DOE stuff that I've seen is that -- and, Christopher, you mentioned the Zero Energy Ready Homes Program. And on a webinar that was provided on that topic, by the DOE, I asked the question about why don't you also have a zero net energy program or, you know, it's a small, incremental step to just add the PV.

But the response I got was people understand zero, but people might not understand net. So, that's kind of the opposite of what we're discussing here is, you know, what is the zero part of this.

And we have, through our stakeholder

meetings that we've had, we've heard the same sort of thing about if it's zero TDV, is that really zero net energy?

So, some clarity on this topic. I know it's one of the toughest topics to address. But I think the DOE also has zero net energy -- renewable energy credit as a subscript. You know, so that when we get to the point of community solar, we get to the point of commercial buildings, or any case where the solar may be offsite we may need to even further explore.

So, I understand that's a whole bundle of things that are not easy to address, but I think it's important to address and nail down with some definitions.

On the other topic that was brought up about the oversizing of PV, and I think this may relate, as well. I just want to make sure my understanding is clear is that when these limits to sizing are used in Part 6 and Part 11, they're for the purposes of compliance and they're not the limit on what can be installed in the field, correct?

MR. SHIRAKH: Correct, yeah.

MR. CAIN: Because I mean, anecdotally, I had one project long ago where the PV system on a residence was hugely oversized and just my curiosity, I needed to know why is this thing gigantic. And the case, the answer I got was the couple who lived there the husband was a contractor and worked some of his stuff at home. And the wife was a ceramics artist and she had electric kilns in her garage.

So, we have no control over those sorts of things and people should, of course, have the freedom to appropriately size for their usage. So, I just wanted to make sure, and George, you know, his comment about somebody not allowing an oversizing on the actual submittal and permit, and installation of PV, and I just wanted to get clarity on that.

MR. SHIRAKH: That is correct. For instance, in Climate Zone 3, the requirement is 3.2 kilowatts. If you put in a 5 kilowatt system, we'll only give you credit for that 3.2 portion of it. You won't get credit for the additional 1.8 watts -- or kilowatts.

Any other comments?

MR. SHEWMAKER: Yeah, I believe we've got

one more comment from George. George, I'm going to unmute you, now.

MR. NESBITT: Yes, this is George. So, my comment about sort of predicted energy use and actual energy use. Well, yes, there is the behavior component. We could put the same size family into the same house and get two different results.

But there's also the fundamental question of whether the computer predictions are accurate enough in the first place, and at least on average. I mean, we just really don't seem to put a lot of effort into sort of validating our predictions.

And in CBECC and even in the actual HERS rating software, you know, you talk about plug loads being the dominant force, yet there's almost no ability to impact those to do better than what is assumed.

And I suspect in a lot of my multi-family projects, I suspect the systems that have been installed have all been too large and have, you know, zeroed out their actual use. And we've gone beyond the economics and that's just part of my concern.

But also, I think legally you're in a position where you're requiring something that you may not be allowed to do, and that makes the code very arbitrary and capricious.

MR. SHIRAKH: Actually, it is not true that we haven't put any effort into trying to validate these numbers. Both us and the IOUs have spent a great deal of resources in trying to assess the amount of kilowatt hours used by plug loads, appliances, and the regulated loads. But in the end, these are statewide averages and individual families will vary from that.

Any other comments online?

MR. SHEWMAKER: I believe that's it for the online comments.

MR. SHIRAKH: So, if there's no other comments I'm going to close this and then we'll move to Ingrid's presentation. Thank you.

MS. NEUMANN: Oh, I need to speak to the microphone, sorry. So, my name is Ingrid Neumann. As indicated on the slide, I'm with the Buildings Standard Office and will be talking about Title 24, Part 11, which is the California Green Building Standards, which we know as CalGREEN.

So, first I wanted to go into a little bit of history so we understand what the purpose of these standards are. So, very generally, they are designed to improve public health, safety and general welfare.

So, we're doing that by reducing negative or increasing positive environmental impacts.

Specifically for buildings, we're encouraging sustainable construction practices. And there are five points here that are looked at in the entirety of CalGREEN.

Now, we're here at the Energy Commission and what we're focusing on is energy efficiency, and so we're just going to look at that section.

So, a little bit of history. The first time something came out with Green Building Standards was in 2008. These were entirely composed of voluntary measures. So, voluntary being something that a local jurisdiction could adopt as being mandatory in their city or county.

This is also provides a preview of what might become mandatory, measures that might become mandatory in the future code cycles. So, for energy efficiency that would be Part 6.

So then in 2010 CalGREEN got the

structure that we know now. It was a very large team effort of the agencies above and many other stakeholders. The Building Standards Commission still publishes the nonresidential portion and HCD takes care of the residential portion.

So, the structure that we're looking at for the entirety of CalGREEN is having some mandatory measures, in addition to voluntary tiers, and usually those are two tiers, Tier 1 and Tier 2. So, that was carried on, on the three-year cycle, right, 2013-2016, and now we're looking forward to 2019. So, that's Part 11, right, is adopted with all of Title 24 on that three-year cycle.

So, if we look at the table of contents, this is what it would look like, right. Chapter 3 gives us the scope. Chapters 4 and 5 have the residential and nonresidential mandatory measures, except for energy efficiency.

Because for energy efficiency we already have those targets in a different part of Title 24, Part 6, as most of you know.

So then, the voluntary energy efficiency targets are found in the appendices A4 and 5 of CalGREEN. So, that's what we'll be discussing

today are the energy efficiency portions of A4 and A5 and what we're proposing for 2019 there.

So, as Mazi went into great detail, we are basing our residential voluntary measures no longer on a percent better than the mandatory standards. We're not using that language anymore. But we're using the Energy Design Rating language. So, we have very specific targets there based on climate zone, and building size, and how that's modeled in CBECC. So, Mazi already went over those details.

So that the mandatory portion is built of where we're at here, in 2016. Right, we're adding more efficiency measures in 2019. There's the PV target that he discussed, offsetting the kilowatt hours, right.

And then, what I'm focusing on here in CalGREEN is adding the tiers, the Tier 1 and the Tier 2, which are voluntary. So, we could have an example of how this might break down.

So, if we're looking at our efficiency target in Climate Zone 12, and these are approximate numbers, you know, we're still working on that, an EDR might look like 43 for a single-family home in Climate Zone 12. And then,

adding the PV target, still as part of the mandatory standard, that target might move down to 25.

Now, a local jurisdiction can choose to adopt the voluntary tiers, further reducing the target, right, towards that ultimate goal of actually reaching an EDR of zero. Right, but it's voluntary. This is mandatory. This is not. There's another picture.

All right. So, how does a local jurisdiction do that? They submit an application to the Energy Commission and in that application they give a copy of their ordinance. They describe precisely what they are adopting. And in CalGREEN, we're giving suggestions what we think might be good things to adopt. But, of course, a local jurisdiction has the freedom to make modifications and make that decision for themselves.

So, along with the ordinance there needs to be a study or analysis showing the expected energy savings, as well as the cost effectiveness of the ordinance.

And so, for Part 6, as you know, we are demonstrating that those measures are cost

effective. For Part 11 we, at the Energy Commission, are not doing that and that responsibility is then passed on to the local jurisdiction, who is choosing to adopt those voluntary measures.

And then, of course, the requirement of doing this in a publicly-noticed meeting and we want to make sure that the standards really are designed to save energy when compared to levels permitted by Title 24, Part 6. Right, there's a lot of talk about GHG reduction and a lot of times that goes hand in hand with energy reduction, but we are responsible for looking at the energy there. And then, evidence of CEQA compliance.

So, all of this is found in Section 10-106, right, the administrative section as far as how to adopt a local ordinance.

So, now going into Appendix 4, this is the description of the residential voluntary measures. We are proposing Tier 1 to be measured in an EDR, or Energy Design Rating. So, we might phrase that as an X percent below or a specific X points lower than the compliance EDR. And we're still working on what might be the best way of

describing that language.

So, as Mazi described, we are considering additional energy efficiency measures. Right, we're going to the extreme there in eking out as much as we can with things, such as triple-pane windows.

Then, of course, we are considering demand management strategies, right, such as load following and the onsite battery, so electric storage. Or, of course, the idea of precooling, you know, having some sort of thermal storage.

MR. SHIRAKH: Can I ask you a question, Ingrid? What you're saying is you can either specify a percentage below or a number of points lower than compliant. What I was suggesting is to actually have a specific target. Would that be --

MS. NEUMANN: I think that's fine.

MR. SHIRAKH: Well, that says points lower than compliance EDR there.

(Off-mic comment)

MR. SHIRAKH: Okay.

MS. NEUMANN: I mean, all of that will be calculated by CBECC, anyhow. So, we could have some example tables, right, I think that would be

helpful so people have some kind of guideline there as we hash it out.

All right. So, then for Tier 2, right, we are taking it all the way down to that EDR rating of zero, which we like to call Zero Net Energy Design, right. But it is going to be very clear that we are meaning an EDR of 0422.

The paths that are considered are, as Mazi suggested, some folks are looking at electrifying space and water heating, right. You could have advanced electric battery controls. And we're still debating on what that could all mean. Right, there are different paths of reaching that goal. The ultimate thing is simply reaching that goal. All right.

And then, of course, that would include modest oversizing of the photovoltaic system probably in conjunction with the battery, right.

So then we have prerequisites. We have some items, such as the QII, which is currently a prerequisite for the CalGREEN tiers. That is moving into Part 6, the mandatory section, as a prescriptive requirement.

But because we can meet Part 6 requirements with a performance calculation, we

would like to keep this in here as a prescriptive portion for the tiers because we think it's a good idea.

And similarly, the high-performance walls and high-performance attics, right, we won't be having a tradeoff, like a PV tradeoff there, for high-performance walls and attics. And it will be a prescriptive mandatory in Part 6.

But we would like to suggest them as prerequisites for the CalGREEN tiers so that those measures cannot be avoided when going to lower EDRs than mandatory.

So, there are some new prerequisites that we are suggesting. Two of them for the residential. The first being the HERS-verified compact hot water distribution system. Now, that currently exists as a compliance option, but now we're going to move it, or we're proposing to move it as a prerequisite.

And here's a new measures with the HERS-verified drain water heat recovery, right. So, rather than wasting any energy with wastewater, right, we can recycle that into the incoming water stream and preheat the water before it goes to the water heater.

All right. So, for additions we are proposing the same type of EDR target language. Right, and that target will continue to vary depending on the number of mechanical systems that we're adding. Okay, so it will be lower if you're changing or adding more systems.

Now, moving on to nonresidential, right. So, our focus really has been to change going from the percent better to the EDR targets for the residential. So, for the nonresidential we are still retaining that percent better than language.

Okay, and those target percentages will continue to vary depending on whether you're adding lighting or mechanical systems, so how many of those systems are included, or both.

So, the outdoor lighting prerequisite does exist already. What we're adding here is that the color temperature should not be higher than 3,000 Kelvin. Because by reducing that allowed outdoor lighting power, right, so we'll be reducing it from the 2016 to 2019, slightly, and then if we're for CalGREEN saying we're going to do it 90 percent less sometimes that was achieved by having outdoor lighting that was a

little too blue. Right, so that wasn't -- it was disturbing biological systems. So, we're adding that to avoid an unintended consequence.

So, then these are new prerequisites here. The warehouse dock seal doors. Right, making sure that conditioned air stays inside, right, so that's reducing leakage there.

The daylight redirecting devices for indoor lighting systems. So, we're trying to take the light from the natural daylight and direct that as far into the building as possible, therefore reducing our lighting load.

And then the exhaust air heat recovery, that's very much like the drain water heat recovery, right. That's why like lose that energy, right, take it from what's going out and add it to what's coming in.

Then, the automatic closing fume hood sashes in laboratories, right, so that the conditioned air is not simply being sucked out in a fume hood when it's not being used. Right, so it has the idea of having the fume hood sashes close automatically in five minutes of inactivity. And, of course, they would detect for obstructions and things like that.

And then, lastly, combustion air requirements. So that the air that's pulled in for combustion, and ventilation, and dilution of flue gases. Right, so that that is not coming from the indoor conditioned air, but rather from the outside.

So, here is our final slide with all the resources. The General Building Energy Efficiency Program webpage. Specifically, then, the prerulemaking that we're in here for the 2019 update. The docket to which written comments should be submitted. The utilities-sponsored stakeholder website, which is very useful and contains the CASE reports, as well. And then, my contact information.

So, I'd like to take questions and comments.

MR. RAYMER: Thank you. Bob Raymer with CBIA and I'm glad I didn't leave for the NSHP meeting.

With regards to -- well, first off, a good presentation on the background of CalGREEN, thank you.

With regards to the prerequisites that are in there, right now in the current code

you've got the prerequisite for QII. And even though the CEC's proposing to move that from a voluntary feature or compliance option to the prescriptive, we would recommend that you keep it in there as a prescriptive.

It's a very useful tool. It helps reduce construction defect potential down the road. And so, we would suggest keeping that. But we can't support putting the other features in there as prerequisites.

Mazi just gave a very good presentation, which we agreed with that, you know, we should be focusing on an EDR score. And industry, one of our big concerns as we always go through an iteration of the standards is, you know, how ready is industry for this? How much of a pain from a design standard? Will the contractors be ready for all of this?

And 2020 is going to be the most significant lift in the history of our State Building Code. And we, of course, are going to have locals going for Reach Codes. But the fact of the matter is, from a design flexibility stand point, we would really urge the Commission not to add on to the prerequisites here.

Case in point, we're beginning, as you've noticed from our previous testimony dating back to April, we've got serious concerns specifically with the wall provisions that the CEC adopted in the 2016 standards. You're adding on stringency to that high-performance wall provision. And probably by March or April of next year we may have very detailed information showing that the 2016 regs for walls wasn't cost effective given the assumptions that were used, let alone the 2019.

And so, quite frankly, industry is -- while we may be embracing the high-performance attics down the road, we're getting some very encouraging news about some new products and installation techniques out there that may have an enormously good impact on our energy efficiency goals and designs that we're trying to seek. I don't see that happening for walls at all.

And so with that, we liked the presentation that Mazi gave. We would strongly urge the Commission to go in the direction of encouraging here is an EDR score you need to get for that Reach Code. It's either, you know, 12

or 0, and go off and figure out how to do it. And I suspect that we're going to see a lot of battery storage with PV.

And for one iteration of the code, wow, that is going to be huge and a lot will be gained from that. But, you know, further adding on with these other items takes away from our ability to go for that flexibility, and we'd prefer that you not do it. Thank you.

MS. NEUMANN: Thank you.

Any more in the room?

MR. MAHONEY: Greg Mahoney with the City of Davis, representing CALBO. And I was just looking for a clarification.

So, in the proposed tiers, CalGREEN tiers for 2019, we're going to be looking at an EDR, specifying an EDR, rather than a compliance margin?

MS. NEUMANN: Correct. For the residential. Not for nonresidential.

MR. MAHONEY: Okay.

MS. NEUMANN: Not yet at least.

MR. MAHONEY: Yeah, I would support that. The City of Davis Council just approved a Reach Code last night and it was for new construction,

30 percent compliance margin. And every time I mentioned 30 percent compliance margin I was always asked what does that mean? What is a compliance margin? And so, it would simplify it if we just had a scale that we could say EDR of that. So, I think that's a good change. Thank you.

MS. NEUMANN: Thank you.

MS. WITHERS: Thank you, Ingrid that was a nice presentation.

MS. NEUMANN: Hi.

MS. WITHERS: My name is Emily Withers. I'm Codes and Standards Administrator II with Department of Housing and Community Development.

One question I have specifically on your presentation is when you talked about the additions and the meeting of the EDR rating. I'm not familiar with the software itself. But when the rating comes up is it for the entire building that has to meet the EDR or is it just the addition portion?

MS. NEUMANN: Could somebody that works more on the software help me with that?

MS. WITHERS: Is it just the addition portion?

MR. SHIRAKH: No, the software has an addition option that you can basically use that to model the addition.

MS. WITHERS: So, the addition itself would have to meet an EDR as a standard -- the EDR as the standard addition then, not the whole building, right?

MR. PENNINGTON: So, being consistent with what the Commission has done previously with additions, and the idea of moving to an EDR. If you were going to apply an EDR to an addition there would be clearly an option for modeling the addition and showing that that addition met that EDR.

There's also, as Bob was saying in the background, an option of the addition plus the existing building, plus alterations to the existing building that you can take credit against that for all of that.

That's a relatively complex approach using a compliance approach for regulated loads. I think to figure out how to do that for an EDR would take quite a bit of thinking through to figure out how to do it.

But that would be sort of the precedent

that you might look to for making this apply to additions. So, I don't know if that helps you very much but, anyway.

MS. WITHERS: Well, I just hope a homeowner with an existing building that was, say, built in the 1950s or the 1960s, when they put on their 400-foot addition they wouldn't be held to an EDR value for the entire building.

MR. PENNINGTON: Yeah, so the -- yes, the standards have no precedent of requiring the existing building to be upgraded to meet some compliance requirement that would be only appropriate for newly constructed buildings or additions. So, we would not go where you're worried that we would go.

MR. SHIRAKH: So, in other words, yeah, there's an option. You can either comply -- the addition by itself can comply with the EDR target or you can do addition plus existing. It's up to the building owner or the energy analyst which path they want to go.

In most cases you want to do addition alone, by itself. But if you happen to be improving the systems in the existing portion, as the part of the general retrofit you may be able

to get credit for measures that you're putting in the existing portion that will help you to comply.

So, you know, the energy analyst basically looks at both options and they decide, you know, which one is the best option.

MS. WITHERS: I also asked for the CalGREEN portion if there are design terms that are being put into the new standards make sure that we put them in as the definitions.

And then, also, for the EDR portions, if there are certain exclusions or exemptions that are included in Part 6 that they also be included as either pointers in CalGREEN, or also restated in CalGREEN. So, I think that would be good.

MS. NEUMANN: Okay.

MS. WITHERS: I need to go back to my program, the State Housing law, and discuss the prerequisites because we may have some concerns with the additional prerequisites, also. And then, we'll be submitting a written comment.

MS. NEUMANN: Thank you.

MS. WITHERS: Thank you.

MR. RAYMER: Sorry, Bob Raymer with CBIA. I forgot to ask when I was up here, regarding

last week's hearing and this week's, is the deadline for written comments for last week, is that September 8th or the 15th?

MR. SHIRAKH: Payam said from last week it was the 6th.

MR. RAYMER: Okay.

MR. SHIRAKH: But if you go a couple days later, we'll still --

MR. RAYMER: Gotcha. What about for this one?

MR. MEYER: We're going to try to get that one sort of the same.

MR. RAYMER: Actually, I'm going to turn them in at the same time, so we'll just do both at the same time.

MR. SHIRAKH: Yeah, that would be good.

MR. MEYER: Yeah, that would be great. Yeah, the faster the comments come in, the more time we have to give them good time to review them.

MR. RAYMER: And regarding Emily's comments, yeah, I agree that if you've got some new terminology, or whatever, to coordinate with HCD and seek consistency.

I'm also a little -- I'm not aware, in

terms of Reach Codes, the application to additions, alternations and repairs. I'd follow that relatively closely. And I see most Reach Codes focusing specifically on new construction.

You are going to have a challenge in the future. As you're probably aware, last year there were three bills passed on secondary units. In some cases the secondary unit is actually a new unit within an existing dwelling unit. Others are those in very close proximity, but extremely small, which may have great difficulty complying with the renewable EDR because they have no space.

But once again the exceptions that Mazi's working on would address that. So, thank you.

MR. PENNINGTON: So, Bob, was that a statutory change that you were just describing?

MR. RAYMER: What happened here and as always so much happened in the last couple of weeks of the legislative session, but there was in particular one bill that allows, under certain circumstances, for the creation of a secondary unit within the confines, within the conditioned area of an existing unit.

Sort of like turning a single-family

dwelling into -- you might want to call it a duplex within the same footprint. But what used to be a living room and a bedroom is now going to be cordoned off. Within that same unit structure and the same structural integrity you'll have a secondary unit that could effectively serve as additional housing. And they're really going to be promoting that in certain -- as opposed to in-fill, building newer units next door.

And so, that was given the headway. And, of course, they put in a codifier that residential sprinklers wouldn't be required in that new secondary unit, if it wasn't already in the original unit.

And so, that was one of three bills that got passed last year. And then there was a secondary unit accessory unit bill. That on site, under certain circumstances, local jurisdictions are now prohibited from doing certain restrictions.

A lot of local jurisdictions didn't like the idea of somebody putting up the granny flat and that bill sort of led it through.

CALBO's done a good job of providing some summaries of those three bills and I think it's

on their website.

MR. PENNINGTON: Could you tell us what those bill numbers are at some point?

MR. RAYMER: I could last year, but I'm old, and stupid and --

MR. PENNINGTON: An e-mail.

MS. NEUMANN: CALBO website, right.

MR. RAYMER: 1069.

UNIDIENTIFIED SPEAKER: It's AB 2299. I don't know what the junior accessory dwelling unit one is.

MR. RAYMER: And then there's one more, AB, and I'll get you that later on today.

MR. PENNINGTON: Okay, thank you.

(Off-mic comments)

MR. SHEWMAKER: It doesn't look like there's any other comment sin the room. We've got a few people online.

First off is George Nesbitt. George, you're unmuted, now.

MR. NESBITT: Yes, George Nesbitt, HERS Rater. Can you hear me?

MR. SHEWMAKER: Yes.

MS. NEUMANN: Yes, we can.

MR. NESBITT: Yes. So, EDR and percent

above the code are actually the same or effectively the same. If you think of, just for simplicity if you take an EDR of 100 being code and zero being net zero energy, a score, a HERS score of 90 would be 10 percent better than the code minimum score of 100.

The difference between the EDR and what we've traditionally used, percent above code, the percent above code has just been heating, cooling and water heating. So, it's only been a portion of the energy use.

So, a 15 percent above code house doesn't change your EDR score by 15 percent. It changes it by much less because of all the plug loads. And the CBECC EDR system does not really allow you to manipulate any of the plug loads much at all.

For target setting in EDR, I think you have to think of it as a percent better than whatever the code minimum is. Because our Energy Code has never been about using an equal amount of energy regardless of the climate. It allows you to use different amounts of energy based on the size of your house, the design of your house, a lot of things. And, therefore, your target --

and in the scale we're using, since we're using 2006 IECC, a 2016 or 2019 code minimum house is not a hundred score. It's 50, 45, whatever, and it varies in every climate.

So, if you want to make a house better than the minimum, if you use a fixed reduction in the EDR or if you went to a fixed EDR score, just saying every house has to be a 20, you're actually going to require every house, in every climate, of every size to make a different level of effort versus if you set the target as a percentage better than the code minimum. At least everyone is having to stretch the same quote/unquote percentage. Although, what they have to do to get there is different.

The issue of additions, we have always -- in the HERS rating systems we have always had the ability to rate an existing home, rate it with an addition.

But here again, you're not going to set an EDR target with the same number for a new house, for an addition with an existing house. Because the existing house is going to score, let's just assume a score of 100 is code and that's the code baseline. An existing home is

going to score more than 100. The addition, in theory, has to be 100 or better.

So, the existing plus the addition, it would be a lot harder to get to a target score for just the new building.

And I think under the code, now, complying with an addition one is extremely hard. And let me make it -- and then, also talking about the issue of prerequisites or mandatory measures for CalGREEN.

From what I've seen from the 2016 Code, it's very hard to tradeoff high-performance walls or attics and without going to ducts and conditioned space, which is equivalent or actually better than high-performing attics.

So, I suspect for 2019 it's going to be even harder to tradeoff any of those. So, effectively, they're almost mandatory. So, in that sense not having -- well, either listing them as mandatory or even not listing them may not make much difference. Although requiring QII as a mandatory measure for CalGREEN I think would be a -- is certainly a minimum step.

And honestly, the HERS verified compact distribution to make that a mandatory

requirement. The proposal for that is such a pathetic waste of water and energy. To make that mandatory I think would just be disgraceful. Thank you.

MR. SHIRAKH: So, to respond to one of your questions. An EDR score is not a measure of energy intensity use of a house. It's a dimension less metric that's basically the ratio of two EIs. The proposed house over the reference house.

Now, for instance, when I'm looking at the EDR scores, Climate Zone 6 and Climate Zone 11, they both have exactly the same target or final EDR score for 2019, it's 22.6.

The difference is in Climate Zone 6 that EDR score is a ratio of two small numbers. In Climate Zone 11, it's a ratio of two very large numbers. So, you cannot use just an EDR has a prediction of how much energy that house uses.

And this is the reason why these two climate zones, even though they have exactly the same EDR scores, for you to go to an EDR score of 12, you need vastly different amount of PV systems to get to that target EDR. Even though you're moving the EDR targets by the same

amounts.

Again, EDR is not an energy intensity use index. It's a ratio. And, you know, you could have the same EDR target with two small numbers division, or two large numbers.

MR. NESBITT: Well, yeah, that's correct. I mean and you can have two houses with the same score, one that's 1,000 square feet and one that's 10,000 square feet. Their energy use is going to be totally different. But that score, because it's based on a -- I mean, yeah, it's a ratio of allowed energy use versus predicted energy use. While it directly does not mean energy use, it's -- anyway. I mean, yeah, a score of 50 on a scale of 150 is 50 percent better than the minimum or the reference, but it's 50 percent better. How much actual energy that is, that's a whole other story so, yeah.

MR. MEYER: So, great. Thank you, George.

Any other comments?

MS. NEUMANN: Yeah, I was just going to say that it's nice to have an EDR score because it's an absolute score. I mean, it's not a percentage. I mean, and we are trying to target

some sort of ZNE. So, having an EDR of zero there. I mean, you can't really go negative, so that's nice.

And then he is correct that the plug loads are not regulated and that's why they don't show up in CBECC.

And I don't think we were suggesting to have the same EDR targets for new buildings, as well as additions and alterations. I think those targets would be different for the reasons that he did mention.

MR. SHIRAKH: Again, having the same EDR score in San Diego and Palm Springs does not mean that those houses are going to be exactly the same. That is not true.

MR. MEYER: And also, just one of the reasons that I think Mazi and others have thought of when focusing on, you know, having similar EDR scores in the different climate zones, you know, taking out the extreme ones, is there are going to be jurisdictions, there are going to be entities who are going to be dealing with this across different climate zones, and we want to simplify that as much as possible.

Having, you know, a jurisdiction who is

dealing with two different climate zones and having different targets or different metrics on that, would be more complicated.

But one of our goals in 2019 is to simplify this as much as possible to make it as easy for people to comply, and is as easy to enforce as possible.

So, I mean, that's just something to keep in mind when you're making your comments. We do understand that there's different ways we could have gone here. But one of the requests we've gotten over and over is to keep things simple, maximize people's ability to enforce and comply with the different parts of our standards.

So, thank you.

MR. SHEWMAKER: So, online we had a question from Pierre Delforge. "CEC had mentioned at the April 20th workshop that it was considering allowing local jurisdictions to set a societal cost of carbon. And to account for this SCC in the performance path in the compliance software. What are the CEC's plans with including SCC in CalGREEN?"

MR. STRAIT: This is Peter Strait with the California Energy Commission. CalGREEN is

about adopting some framework for local jurisdictions to voluntarily adopt energy efficiency standards that are more stringent than ours.

So, in terms of the code language that we adopt there wouldn't be those topics reflected in code language given that's not what -- I mean, given what we put into CalGREEN.

Now, if there are local jurisdictions that want to adopt a local ordinance based on a societal cost of carbon, there's nothing in CalGREEN that says that they cannot do that. But it's not what the language in CalGREEN is there to do.

MR. PENNINGTON: So, Pierre, this is Bill Pennington. So, you're correct I think the statement was made on the April 20th workshop. And the staff has been looking into this issue. We haven't reached closure on the question, so we didn't include it as a proactive recommendation today. But we're not done with the question.

MR. SHEWMAKER: So, we've got another comment online from Tanya Hernandez. Tanya, I'm going to unmute you, now, if you can state your name and affiliation.

MS. HERNANDEZ: Hi, can you hear me?

MS. NEUMANN: Yes, we can.

MS. HERNANDEZ: Okay, great. So, I'm Tanya Hernandez with Acuity Brands. I had a question about the slide regarding outdoor lighting. I believe it has a limit of 3,000 Kelvin for outdoor lighting, is that correct? It went by really quickly.

MS. NEUMANN: That's correct, yes.

MS. HERNANDEZ: Okay. So, most outdoor lighting is 3,000, 4,000 Kelvin level, and so the concern is knowing that the IES has put out a position paper, basically disagreeing with the AMA report. We're wondering what research was used to come to the conclusion that 3,000 Kelvin should be included in the standard as a limit?

MR. STRAIT: So, this is Peter Strait with the California Energy Commission.

We're seeing a building consensus that -- I'm sorry, no pun intended, that too much blue light in the outdoor environment at night is harmful. That is it creates disruptive effects to residents trying to sleep, to wildlife if there's wild areas nearby.

We aren't -- we're still watching this

evolve. We understand that the exact number might settle someplace slightly different. We are, for this reason, proposing now 3,000 K which seems to have been a common thing that's been circulated. We've seen folks pushing for 2,700. We've seen folks pushing higher.

I think we can agree that probably a lot of 7,000 Kelvin lighting might be disruptive. And, in any case, this is an advice to local jurisdictions. If a local jurisdiction wants to adopt a Tier 1 requirement and instead specify 4,000 Kelvin, based on whatever the research looks like by that point in the future that would be allowable under the code.

So, we're looking at 3,000 K as a starting point based on the literature that's out there at the moment. We're not conducting any independent or additional research as a part of what we're doing here. We're simply keeping an eye on and reviewing other information as it's published by different organizations.

MS. HERNANDEZ: Okay, thank you. So, we'll be sure to comment. Thank you.

MR. STRAIT: Thank you.

MR. SHEWMAKER: Then we have one last

comment. This may be carryover from the previous presentation, but Jon McHugh, I'm going to go ahead and unmute you, now, if you have a comment or a question?

MR. MCHUGH: I think that's leftover from last time, thank you.

MR. SHEWMAKER: All right.

MS. NEUMANN: So, no more questions?

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

MS. NEUMANN: And no more in the room.

MR. MEYER: Okay, I'd just like to thank everyone. Just one final thing that sort of came up more as a focus this year when we're talking about Reach Codes, and things of that nature that we wanted just to make sort of clear from the Energy Commission's standpoint. As Ingrid pointed out that when a local ordinance is adopted and it comes to the Energy Commission, we are not technically approving the entirety of that local ordinance.

We're acting as experts on energy efficiency and we're basically -- we're making a finding that that proposed ordinance is diminution of energy consumption compared with

Title 24 Part 6.

You know, we do require that they go through a CEQA process and they tell us that they've done that. That they do a cost effectiveness study as part of their application.

But we are not reviewing and sort of fact checking the other analysis in there. We're focusing on making a finding that it's a reduction of energy consumption. Because by the time it comes to us it's already gone through a local process and been approved. They're just looking at our findings so that they can actually enforce that.

So, that's just something that, just to be clear, there's still an expectation that the local jurisdiction do the appropriate analysis on cost effectiveness and the other aspects of what they're proposing in a local ordinance.

But just for that, I just want to say thank you to everyone for coming out and participating, those here and on the phone. Your participation makes these events worthwhile and very productive for us.

And also want to thank Chris and Michael for helping us run this. It went smoothly. And

thank you, Mazi and Ingrid.

So with that, thank you everyone and hope you have a good week.

(Thereupon, the Workshop was adjourned at 11:13 a.m.)

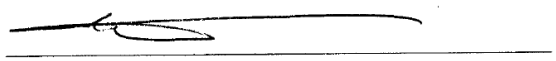
--oOo--

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 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 15th day of September, 2017.



PETER PETTY
CER**D-493
Notary Public

TRANSCRIBER'S CERTIFICATE

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

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

IN WITNESS WHEREOF, I have hereunto set my hand this 15th day of September, 2017.

Myra Severtson
Certified Transcriber
AAERT No. CET**D-852