COMMITTEE HEARING

BEFORE THE

ENERGY RESOURCES CONSERVATION AND DEVELOPMENT

COMMISSION OF THE STATE OF CALIFORNIA

In the matter of,	)	
	)	Docket No. 14-BSTD-01
	)	
2016 Buildings Energy	)	
Efficiency Standards	)	

CALIFORNIA ENERGY COMMISSION

HEARING ROOM B

1516 NINTH STREET

SACRAMENTO, CALIFORNIA

WEDNESDAY, JULY 23, 2014

10:00 A.M.

Reported by:
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APPEARANCES

CEC Staff Present

Martha Brook

Mazi Shirakh

Peter Stark

Bruce Wilcox (Via WebEx)

Public Present

Bob Raymer, California Building Industry Association

Cathy Chappell, TRC

Smita Gupta, Itron

Jon McHugh, McHugh Energy

Mike Hodgson, ConSol

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Mark Hoeschele

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George Nesbitt, HERS Rater

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P R O C E E D I N G S

JULY 23, 2014 10:00 A.M.

MS. BROOK: For those of you online, this is Martha Brook with the California Energy Commission and we're going to begin our 2016 Standards ACM Workshop.

For those of you in the room, we have a signup sheet and I hope you'll staple your card to it or just fill out the information so we can contact you in the future.

We are going to try and do this as a WebEx meeting, so if you want to make comments we want you to do that, but you need to do it with an open mic.

And we have a very kind of short and brief agenda, but we also have open discussion and we hope that we spend most of our time there and talk about anything that's relevant to the compliance software for the future 2016 Building Energy Efficiency Standards.

So, first I'd like to introduce staff. Mazi Shirakh is our Program Manager for the 2016 Standards. Mazi, do you want to just raise your hand for the people that don't know you.

Todd Ferris is the Supervisor for the Compliance Software staff in our office.

And Sabaratnam -- Sabaratnam's not here, yet.

Dee Anne Ross is doing our daily care and

feeding of our CEBECC-Res public software tool. And Saran is the equivalent, doing the care and feeding of our nonres compliance software and helping us do the vendor testing that we do when we do the ACM approvals.

And I'm Martha Brook. I'm a Senior Mechanical Engineer at the Energy Commission and I've had oversight responsibilities for both the residential and nonresidential compliance software for the 2013 Standards.

Let's see, so what we wanted to talk about today is -- can you make that little participant box go somewhere else?

Okay, so these are kind of just the things that we've been thinking about for things that we need to do for the 2016 Standards, some kind of fundamental changes to the ACM Approval Manual.

We're going to have to be talking about this at sort of a high level today. We haven't had the time to actually recommend specific document language changes. All of us on the software side of our office have been 24/7 working on the 2013 Standards implementation, so we haven't had the time to make specific recommendations.

So, we'll talk about what we want to do. And then at the end we'll also talk about a process for next steps and how we actually get to recommending code

language changes to catch up with the rest of Mazi's 2016 update process.

We think we do need to make some changes to the ACM Approval Manuals and we'll talk about that.

We think there's some standards cleanup that needs to be done in the main Building Standards regulation.

Mazi's going to introduce some residential compliance options that we're going to be implementing in the 2016 update.

We're going to talk about our idea for specifying performance targets in our REACH Code that goes into Title 24, Part 11.

And then we'll open it up for discussion about anything that anybody wants to talk about in this software domain.

So, ACM Approval Manuals, this is just sort of my kind of brain dump this morning about things that are on my list. I'm sure staff will have others and feel free to chime in.

But we need to have a quicker way to get Compliance Manager updates out to the ACM vendors. So, the Compliance Manager is what we call the CBECC-Res and the CBECC-Com compliance engine for programming interfaces or ATIs. That's that core software piece

that includes an analysis engine, data model and a rule set for modeling the proposed standard design buildings, the kind of core part of our performance approach.

We have the streamlined approval process in the ACM approval manual, but it still takes us weeks to get through that process, so it’s not streamlined enough.

And we really need to kind of break up our manual document to today’s, you know, best practice process for updating software.

So, we need to revisit that and really put this kind of regulatory document into sort of best practice software management process so we can actually support the vendors better.

So, the vision of distributing an API that the vendors can integrate in their tool only works if we give them the kind of support that they are used to providing their clients in terms of turnaround for fixes, for example.

So, we need to do a much better job and actually have our regulations support us in that process.

I’m still on that, yeah. So, that was the first bullet.

The other thing that we’ve talked about with some vendors is something that we potentially could even do with the 2013 Standards based on the current ACM

Approval Manual.

But there is interest by some vendors to take our rule set, the rule set component of our API and apply it directly into their building energy analysis framework for their software.

So, for example, in the CBECC, in the nonres ACM approach, for example, instead of using energy process calculation engine, a software vendor would have the option of taking our rule set that we manage and control, and applying that rule set to their building design, descriptions in their data analysis software.

And I think that this is very doable because we also have a requirement that the vendor software passes the ASHRAE 140 best test, which basically is a sort of comparative analysis of nonresidential building energy analysis tools.

So, we would, by using and keeping that requirement, we would have confidence that the vendor software would be calculating things on par with our reference method, which is Energy Plus.

But we don’t necessarily have to require them to use Energy plus. And there’s certainly benefits for both the vendors and for the Energy Commission that we need to kind of think through those and see if the pros and the cons really would kind of urge us and push in

the direction of facilitating this to happen. We can talk about that more this morning with some specifics, if it's helpful.

One of the things that we ran into just with the regular update of our residential software is that the ACM Approval Manual is not explicit about the fact that what we want to be able to do, and we think that largely we have been doing for a very long time, is having this automatic decertification of previous versions of ACM software when you updated the Compliance Manager for both the public domain software and for vendor software.

So, right now we potentially are acting, if you read the ACM Approval Manual, we're not following it exactly because it basically only describes this very lengthy decertification process. That's really not applicable to the regulating and updating the versions of the software.

So, that decertification process that's described in the manual is really talking about when some piece of software out in the market has some fundamental problems that people are finding, and are really concerned about.

And we have described a process for anybody to come to the Commission and say there's really something going wrong with this ACM software that you approved.

We need to go through the process of potentially decertifying.

That’s not the same process we want to use every time we update the ACI and get our software and vendor software updated with fixes and new capabilities.

So, we just need to clarify the language to allow this other type of decertification.

We’ve been acting that way, but we’re not covered in the language of that to the extent where all lawyers would want us to be, but we’re working on that.

And then the other thing that will probably need to go into this ACM Approval Manual update is the idea that’s been floated by several people, parties that participate in our standards update, and that is the approach where potentially -- so that we never have the situation where the standards implementation is delayed because of a software update not getting done in time.

That the Approval Manual could actually explain an alternative process where any software that’s approved for the code update that’s sunsetting can be used for the new standard implementation by calculating some sort of a performance method that’s previously approved by the Commission.

And that that performance metric is basically what says you pass or fail, rather than the new version

of the software.

So, for example, if it’s a whole building energy use metric, at TPP per square foot per year terms, we’re already producing that information in the compliance documentation, but it’s not the basis of compliance.

So, you could say, for example, we would establish in either the Approval Manual or some other regulatory document the EUI targets you would have to meet to do this sort of next standard implementation performance calculation.

And the thing that’s appealing to us is it’s actually the same metric that we’re talking about using in the REACH Code for this whole building energy use target that you would meet.

Instead of saying you’re X percent better than base code, you actually say you’re meeting this whole building EUI for either the REACH Code or for this.

We know short term, probably, implementation but, basically, this would only work if it has a sunset date. Basically, assume there’s new software available to use and you have to use it, but this would be an interim thing that’s in place at every kind of transition from code cycle to code cycle, so that you never get stuck and you don’t have software to use for implementing the new standards.

So, that's something we want to talk about. That all kind of falls into what we would be working on for the updates of the ACM Approval Manuals.

So, standards cleanup, these are things that basically staff think are really important to get better in the standards because it turns out that specifications for the performance compliance approach, which gets implemented in software, are scattered throughout multiple standards documents and it's really untenable.

It's actually very, very difficult to actually figure out what all of the requirements are for the software when they're buried in reference appendices, they're buried in different sections of the standards. And, oh, also, by the way we have a full specification document called the ACM Reference Manual where we want all of our specifications, not just part of our specifications.

So, this is really just identifying areas in the regulatory language where we think we have to do cleanup. We shouldn't be specifying a performance approach in the standards document when we also specify a performance approach in the separate specifications document. It all should be in one place and that's what we'll be striving to do.

So, just in reality, some of the things that people are looking for in the software that aren't there yet, we're not there yet because we didn't realize they were requirements until really, really late in the process because they were buried in the reference appendices part. So, that's what we're trying to clean up.

So, now Mazi's going to talk about the residential compliance options that he's thought about for the 2016 standards.

MR. SHIRAKH: Good morning. The next slide.

MR. RAYMER: Are we doing questions at the end of all of this?

MS. BROOK: I don't really care. Do you have --

MR. SHIRAKH: I think we can do questions before we move to the next section.

MS. BROOK: Yeah, come on up, Bob. And if you could introduce yourself for the people that don't know you, that would be great.

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

Regarding the issues that we just covered, we definitely like the idea of having availability to a modeling compliance tool well in advance of the effective dates.

And so, you know, we still have to see this in practice but that is a significant step forward and something that we'll strongly support.

I'm not doing energy compliance modeling myself, having others do that for us. I hope I'm not off the point here.

But we've run into -- let's look at the 2013 Standards and the implementation of those. We've had six updates of CBECC. We're most likely heading into our seventh update, I believe, probably sometime in August.

And I'm assuming that every one of these had very solid technical bases for doing and fixing the bugs that we and others identify, taking care of it quickly.

But in the field this raises some interesting issues. And, in particular, if you're got early adopters or even those who just simply, you know, want to move forward with design now and in preparation of the July standards, they'll be using a specific program.

Let's say they were using 1B, or whatever, to do compliance with. And keep in mind that the building officials, of course, are obviously linked in this in the same way.

And so, for phased production housing, which is absolutely the vast majority of housing that goes on in

California today, that has significantly increased over the last ten years, you come into a serious field application issue.

And that is you can go ahead and develop your models off of one particular program and, in most cases, these updates don't have a significant impact on total compliance.

But in the particular case of moving from 1E to 2.0, there was a rather significant bump. And I suspect that for a two-story single-family, as we move into the next update, assuming that all this happens on ventilation, there will be yet another significant bump.

Consequently, if you're not sort of putting in a fudge factor, if you're the builder and the designer, and going way over, you know, if you're right on the compliance margin with 1B it presents a host of issues for you.

And, in particular, you can in good faith, using the compliance modeling tools available at the time, develop products that meet the requirements of the energy regs.

Now, consequently, let's go to 1C, 1D, 1E, and then 2.0 and then 2 point whatever, and we're now into August or September, and you're now starting to move into phase 2 or phase 3 of the project. You've got the

same models. You're not making any change in this stuff.

And a building official, I understand it's a long-standing policy that you can continue building off of the initial program that you initially submitted under, unless you start changing your models or whatever.

And so that's understood. However, it would be very helpful, number one, to clarify that in writing and make it available on a very regular basis to the building departments.

MS. BROOK: Okay.

MR. RAYMER: Because what is happening is those who, in good faith, complied with 1B will now be dealing with building departments who have access only to 2.B, or whatever we're going to call it, and that raises a big issue.

Most building departments are one- and two-man staffs and you're lucky if they have the latest version, let alone 1A or 1B.

And so that's a problem. So, to the extent that we can somehow solve that in the coming two and a half, three years to make sure that it's all clear -- I kind of get the feeling that what you've done with the public domain program, this type of update is going to become

far fewer and, you know, longer in between because, you know, we're fixing the bugs now --

MS. BROOK: Right.

MR. RAYMER: -- as opposed to reinventing the wheel in 2016, which ain't going to be happening.

MS. BROOK: Right, right.

MR. RAYMER: So, you know, I'm just envisioning we're in a very difficult situation right now. I can tell you tomorrow -- I'm on the CALBO Energy Advisory Committee and tomorrow, at 8:30, we've got our regular monthly conference call. And I just know for a fact that every building official on there is going to be raising issues about this particular issue.

And that, well, they're making chances which are changing the standards after the adoption. Well, they're fixing bugs in the system is what they're doing.

The problem here is it impacts design. They need to have a clear understanding and industry needs to have a clear understanding that if you comply with 1B and you haven't changed your models, you're good to go.

But right now, you know, saying that's verbally okay at the CEC and it's in a blueprint, it would be better to make this a regular release.

You know, as you come up with the decertified one and go to the next one to make it very clear in that

press release, or whatever that, and by the way, if you've complied with the previous one you're good to go. You don't have to go back and redo plan check and all that, so that would be very helpful.

MS. BROOK: Okay.

MR. RAYMER: But we definitely like the idea of having a compliance tool ready well in advance to the effective date. So, we love that, okay.

MS. BROOK: Thank you. Are there any other comments before Mazi talks about residential compliance options?

So, John, we did mention before -- I don't remember when you came in. Right, but we have an open discussion at the end and we can talk about it any time. Okay.

MR. STARK: Just as a note for those that are attending remotely, if you have a comment or wish to ask a question at any time, you can click the raise-your-hand button. That lets us know that you'd like to speak and then we'll pick it up and put you on the air in here.

MR. SHIRAKH: There are no online comments at this point.

So, we'll move to the compliance option portions of this. There's really a couple of ideas that have

been floating around related to new compliance options for this round of standards. I mean everybody's pretty much aware of them. It shouldn't come as a surprise.

The first one is probably the more significant one, is the Federal take compliance option.

We introduced some form of photovoltaic compliance option in the 2013 Standards, and including climate zones for HVAC equipment and sizing.

So, that was the first time we actually had photovoltaics recognized as a compliance option.

MS. BROOK: Can you just clarify that you're talking about residential?

MR. SHIRAKH: This is residential. I'm sorry, yeah. Both of these compliance options are for residential homes.

So, under the 2016 Standards the idea is to basically expand that option.

If you guys were here two days ago, we went through the list of proposed residential measures, which included instantaneous hot water heaters, and we also had two envelope measures, the high-performance attics and high-performance walls.

In an earlier workshop we talked about residential lighting, high-efficacy lighting throughout the house.

So, those are the four main prescriptive measures or mandatory -- lighting is mandatory -- that we're introducing.

Two of those measures, which is the high-performance attics and high-performance walls, would be available for this tradeoff against the photovoltaics.

So, you know, if a builder chooses for various reasons not to do that high-performance wall or the high-performance attic, or both, they can trade those away by putting some amount of PV on site.

And later on I'll show about approximately how much PV it will take to do that.

But if a builder chooses to take the PV credit, they are required to do a QII. And the reason for that is, you know, we think that the building integrity must be protected before we add the PVs on the roof.

QII protocol is fairly commonplace, right, and the costs are fairly reasonable. And, you know, we think it makes sense to protect the building envelope before we require PVs up on the roof.

So, the baseline for PV tradeoff that cannot be traded would be the 2013 Standards requirements, all of it, including the building shell requirements. Plus, tankless water heater and QII, so that would be the -- basically, you cannot trade those away.

You cannot trade away the QII, or the tankless, or any feature that's part of the 2013 Standards.

And in a way we still have a very nice, very efficient building. And so that would be the minimum requirement.

The next slide, please. We're also working with CPUC and IOUs to secure incentives for high-performance walls, high-performance attics, and ducts and conditioned space. I forgot to put that one up there.

Additionally, we are also allowing the PV tradeoff against the total glazing.

Under the current standards and previous standards for residential building the total building fenestration requirement was limited to 20 percent of the conditioned floor area, and 5 percent for west facing.

But in reality, the way models or buildings, plans work is you have usually one façade, which is the back and it has about half of the building.

And so, you know, as they do the floor orientation compliance, you know, that's going to be facing west.

So this tradeoff allows for the floor orientation compliance. You know, they can basically have one design and they can rotate it throughout the

subdivision as they may.

And there will probably be a minimum requirement for the PV size, similar to the current requirement about 2 kW.

And from an economic point of view, you know, 2 kW makes sense because below that there's some fixed costs associated with installing PV, which is the same regardless of the size.

So, the cost per watt really goes up below 2 kW.

And there's also, you know -- sorry.

MS. CHAPPELL: Can I ask a clarifying question?

MR. SHIRAKH: Sure.

MS. CHAPPELL: Okay, Cathy Chappell, TRC. So, this additional PV tradeoff for glazing area is that -- is it an either, you can either do that or you can tradeoff against the HPA, HPW or is another way to think of it is the tradeoff is against high-performance attics, high-performance walls and glazing.

MR. SHIRAKH: The last one.

MS. CHAPPELL: Okay, so it's just all three combined.

MR. SHIRAKH: Right.

MS. CHAPPELL: Okay, thank you.

MS. GUPTA: So the 2 kW PV can tradeoff all of those three things?

So, this is Smita Gupta. So, the 2 kW PV can tradeoff all of those three things? It's not a performance-based PV credit.

MR. SHIRAKH: It is. I'll let Martha answer that one.

MS. BROOK: So, this is going to be a little awkward because I'm not sure Mazi and I have talked enough about this to say the same thing.

But so the credit will be the TVV equivalent to the difference between excessive glazing, high-performance walls, high-performance attics.

So, I haven't done the analysis and maybe Mazi already knows this because of the table he's going to show us next. But if you did all those three are you always under 2 kW? I don't know the answer to that.

MS. GUPTA: And every kind of building.

MS. BROOK: Right, right. But you see what I mean, we're not saying -- as long as you put in a system we're going to give you every single piece -- every single thing we think you're going to generate in terms of TVD we're not giving you. We're giving you exactly what the tradeoff is in energy for the efficiency measures.

MS. GUPTA: But just to clarify, so it's still not a PV performance-based credit, it's still a static

credit just on the static size. So, it's not the system specifics and high-performance credit or --

MS. BROOK: We might do one better little pinch at performance credit, but it will be all done sort of baked into a look-up table.

So, we might say if you -- and this, we're not sure about, but if there are significant performance differences between PV modules that we can quantify in some, you know -- by doing lots of runs with our PV calculator and identifying where we might be able to segment the performance, we might be able to do that.

But our ultimate goal is not to have an hourly PV calculator in this version for 2016. We're trying to not go there until we actually have PV requirements, not just tradeoffs that are pretty easily met with the worst-performing PV system and the worst orientation is sort of where we're thinking about.

So that's -- I don't know if you're going to speak to the issues with that, but we know there are issues with people wanting to get credit for better PV performance.

So, we don't have the resources to do all of that for 2016 and we're also not sure we need to based on the limited credit that we're going to be giving. But there's pros and cons and we need to think all of

that through.

MR. MC HUGH: So, just a clarifying question, Martha.

MS. BROOK: Name?

MR. MC HUGH: Oh, I'm sorry, thank you. Jon McHugh, McHugh Energy.

So, Martha, you're looking at -- in generating these tables you're looking at facing your panel at 110 degrees from north, having a system that has a poor temperature coefficient or, basically, degradation associated with temperature.

And you're nodding your head yes, but maybe you want to say something?

MS. BROOK: No, I like to nod my head knowing nobody knows what I'm --

MR. MC HUGH: I always assumed that meant yes, but okay.

(Laughter)

MS. BROOK: So we have staff that have a lot of experience with using the PV calculator, so we'll be depending on them to tell us are there clear differentiations in performance that we can verify in the field without a full blown PV verification. Again, because this is a design and construction standard, right, and we're giving -- we don't want to require the

NSHP level of field verification for performance of PV.

So we need to figure out where the right place to land is in that continuum between differentiated products and having the verification in the field be too onerous and too uncertain in terms of whether we're getting what we're asking for.

MR. SHIRAKH: Mike?

MR. HODGSON: Mike Hodgson, ConSol. I really don't like the static approach at all. I think you're missing a huge market opportunity.

What we're trying to do, I thought, was go to zero.

MR. SHIRAKH: Uh-hum.

MR. HODGSON: And we have -- the market, we have very efficient envelopes and we can agree and disagree on how efficient they are, but we have a very efficient envelope already.

The industry has agreed not to go below 2013 Standards, which we need some clarification on exactly what that means. But I mean that's not a big deal, I think we just clarify that.

And I think we have some issues with the non-stucco market that we haven't brought up, that we need to talk about.

But assuming, you know, I don't know the

workload, Martha, so I can't address that. But we're already doing New Solar Homes Partnership verification in the field now and we're doing thousands of them. And the industry's accustomed to it, so I don't see that's a burden. We're already doing it.

We want to encourage solar panels to get more efficient so we want to give those who give more power per square foot, for whatever, to get more credit.

Now, does that mean the envelope's going to slide down and we're going to trade more things off?

The answer is no. You have basically a deal in place where there's a minimum envelope standard with a good water heater, and whatever else we're going to decide on. But I mean I think the basis is there.

What we want to do is encourage people who are getting a 75 to meet code, on a HERS scale, which we don't use in California effectively at all, to get a 62, or to get a 54.

So, I am one production builder, and Randall's another, and we're across the street from each other. He's selling a 45, I want to go sell a 42, right.

MS. BROOK: Uh-hum.

MR. HODGSON: So, you're missing a huge market driver if you do not give them a performance -- it's not a credit because we're not downgrading the standards and

we're not changing --

MS. BROOK: So, I think what you're saying is you want to -- if we generated a design rating in the compliance documentation that is equivalent to a national HERS rating --

MR. HODGSON: Correct.

MS. BROOK: -- that it would fully value the PV component. I think that's a completely different discussion than the tradeoff PV credit that Mazi's talking about.

MR. HODGSON: I think it is. And I think that's a discussion the building industry wants to have.

MS. BROOK: Okay, good. No, I'm just clarifying it in my own mind because I'm thinking about how I would implement it in the software. And the tradeoff approach is completely different than integrating a PV calculation that differentiates performance in order to give a whole building rating that you use for other purposes besides code compliance.

MR. MC HUGH: So, Jon McHugh, McHugh Energy. So, just following up on that, currently in the software we have both the compliance calculation and the design rating.

And what Mike's talking about is something that -- because right now, as I remember, you have a PV

line in the compliance level, but I don't think you have another PV line in the design rating. So, this is so much PV that is allowed for the compliance calculation.

MS. BROOK: Right.

MR. MC HUGH: And then this other line below is also down there with lighting, and plug loads, and all those kinds of things that then affect the design rating and, ideally, would be the same identical format as in the HERS format.

MS. BROOK: Okay.

MR. MC HUGH: Am I catching what you're kind of looking for, Mike?

MR. HODGSON: Yeah, I'm looking for the latter, Jon.

MR. MC HUGH: Yeah.

MS. BROOK: Okay, good. No, that's really good information.

MR. HODGSON: And because I think the other, if it's just strictly a tradeoff and it's kind of static and it's transparent. I mean if you meet code, you meet code, right?

MR. SHIRAKH: Right.

MR. HODGSON: And I don't care if it's 2 kW or 10 kW. But if I have a 10 kW system, I'd like to have a lower score to market it.

MR. SHIRAKH: Right.

MR. HODGSON: Because I'm going to try to drive people to buy my houses --

MS. BROOK: Sure, sure, sure.

MR. HODGSON: -- as opposed to Randall's, who are no good.

MR. SHIRAKH: It makes sense.

MS. BROOK: Yeah, come on, step up.

(Laughter)

MS. BROOK: So, we'll need to talk about that internally. We have some kind of under-the-hood issues relating to the fact that the PV calculator isn't in an open source environment. We have some real problems with updating and maintaining that.

So, we don't necessarily want to bring in something that kind of violates our own decisions that keep everything open source. So, we'll have to figure out how we can actually implement something like that.

But I think that your comments are very welcome.

MR. HODGSON: And I think it also coordinates with -- excuse me, this is Mike Hodgson, again. It's coordinating with our efforts to attempt to get the national rating scale and the California closer. Not necessarily similar, but closer.

MS. BROOK: Right.

MR. HODGSON: Because that also will have an impact on potentially incentives that come out from tax credits or other legislation that's national, that we do not want to be left out on.

MS. BROOK: Right. And I actually think that it's important that -- that this group could actually be a driver for the Commission making some decisions earlier, rather than later in that regard.

So, for example, the Commission -- if we bring this information to our decision makers, we could basically say for these 2016 standards we need -- we're recommending using the national baseline to calculate this design rating, for example, and just to make sure it doesn't violate any of the other proceedings that are happening around the State.

MR. HODGSON: Sure.

MS. BROOK: Okay.

MR. SHIRAKH: Ken.

MR. NETTLER: Ken Nettler with EnerCom. Can you clarify for me these last couple slides?

This is only going to be a performance tradeoff or it's also available under prescriptive somehow?

MR. SHIRAKH: Performance.

MR. NETTLER: So it's all performance. So, what it would do is change the standard design if you checked

the box that said I'm using PV?

MS. BROOK: No, I don't know, I think it changes the standard design. I think that it's just calculated credits on the proposed design like we do now.

MR. SHIRAKH: The standard design would remain the same, just propose --

MS. BROOK: Standard design would not have PV.

MR. NETTLER: Well, but how do you decide how much of HPA or HPW, or how much glass you're allowed to trade off?

MS. BROOK: Well, the same way we do it now, right. What we do now is --

MR. NETTLER: So, you're going to hardwire that based on some calculations done --

MR. SHIRAKH: Exactly.

MS. BROOK: No, no, no, right now in the software what you get for PV credit is a minimum of either the generation amount or the cooling tradeoff. And we calculate the cooling tradeoff in -- in that early rule set calculations we calculated what the credit would be for every building and every climate zone.

And that is, I would say, a hundred percent of the time the minimum of the two, and so that's what the credit ends up being.

So now we would have to for -- it's going to be much more complicated, right, so we have to figure out what the --

MR. NETTLER: Yeah, so before --

MS. BROOK: -- all those interactive things.

MR. NETTLER: In the 2013, yeah, it was just one thing. It was that change in cooling equipment efficiency.

MS. BROOK: Appliance efficiency, yeah.

MR. NETTLER: And not it's, I mean window area, and orientation and --

MS. BROOK: Yeah.

MR. NETTLER: Okay, thank you.

MR. MC HUGH: Are what you're looking at that you're -- if someone's using PV you're going to have three runs? One, which is a run that's basically the 2013 baseline and making sure that all of your efficiency measures are more stringent than the 2013 baseline, plus QII; and then you do a second run which is the 2016 baseline as compared to the proposed plus the PV. Is that essentially what you'd be looking at so --

MS. BROOK: Well, this is where I end up like wanting to kill Mazi right now.

(Laughter)

MS. BROOK: Because it --

MR. SHIRAKH: That's why we don't sit next to each other.

(Laughter)

MR. MC HUGH: Completely not personal.

MS. BROOK: I'm always like, "holy crap", now I have to implement it.

So, we have to think it through and we need to figure out what's a reasonable amount of resources we can apply to it and what specifications we have to make.

MS. CHAPPELL: This is Cathy.

MS. BROOK: Oh, go ahead.

MS. CHAPPELL: Cathy Chappell. I think this is basically the same question as Jon's or a question on the same issue.

But if it is just a performance approach and it's compared to the 2016, how can you guarantee that these are the only three things that it's traded off against? And I think that's what Jon was trying to get at is you do one run and you do the next run.

MS. BROOK: So, you know, we might be recommending we withdraw this proposal when we figure out we can't figure out how to actually implement it but --

MR. HODGSON: I mean -- Mike Hodgson, again.

Maybe it shouldn't be just performance. Maybe it should be performance and prescriptive.

MR. SHIRAKH: Uh-hum.

MR. HODGSON: I mean this is going to be -- if you can figure this out with some leeway, margins of error, you know, to the benefit of efficiency, or renewable, or both, check the box. There's 12 things you do, you walk away and you're done.

MR. SHIRAKH: We might be able to do that. We need to think through it.

MR. HODGSON: I think that may have some attraction, but I'm hanging on to the HERS score because I think that's a competitive market mover that we are going to need to move us.

MS. BROOK: You're right. And I'm guessing, without thinking too deeply about it, that it would be easy, pretty easy to do the prescriptive option for high-performance walls and attics because those are prescriptive requirements.

But anything above 20 percent, that's a lot harder, right, because it's open ended and it's pretty impossible to do a prescriptive alternative for an open ended.

MS. GUPTA: Right because it would be dependent on the size of the home that you're running.

MS. BROOK: Right.

MS. GUPTA: So, the 20 percent could scale to any amount there.

MS. BROOK: Yeah.

MS. GUPTA: And to add another, you know, layer while you're considering everything else, would be the PV financing model. Also, if you want to give consideration to the fact that these PV systems, typically in the new construction market, even, are now going to be leased systems.

And the potential persistence or the non-persistence of a measure in terms of energy efficiency, you're allowing something to trade off.

But with a leased system what is the guarantee that that PV system is going to stay on that building.

MS. BROOK: Right, right, right.

MS. GUPTA: Especially with changing hands of buildings and the lease liabilities that still are not completely resolved in the market.

MS. BROOK: Uh-hum, okay, well, that's a really good point. And the problem that we have right now is that we've heard -- we don't have good enough information about that.

Well, we've heard people say what you said, Smita, but then other people say they never take them

down, even if they -- it's too much -- too many resources to take them off the roof, right, so we're not sure what the right information is.

Because we haven't gone through the lifecycle of the PV or the leasing options, right. We're just at the beginning of that.

MS. GUPTA: Exactly the point, something to be aware of given the standards and that these buildings, especially given the ZNE goals, that if you're driving towards those this would send -- you know, this would sort of create a different market or sort of change the market, potentially, for the next steps.

MS. BROOK: Yeah, okay.

MS. GUPTA: So, you don't want to inadvertently do something that sets up a path that's not conducive to the future.

MS. BROOK: Right. So, you think that we could or should, actually, differentiate between owned systems and leased systems in terms of performance credits?

MS. GUPTA: I don't know if there's a yes or no answer to that, but basically have that factored into some sort of, you know, way of defining. If you're going for the static PV system, just as like a bottom line system or the most conservative system, setting some rules around it, potentially.

Or, conversely, allowing for a more performance-based system, then add more layers of criteria to what qualifies a system.

MS. BROOK: I see, okay.

MR. HODGSON: A quick comment on PPAs. The majority of new construction -- the majority of solar systems going into new construction are going under the PPA model.

And I don’t think we understand that well enough, yet. But if you look at their business model and talk to people who are actually selling these, it’s interesting, you may -- that may be the preference of the Energy Commission is to have PPAs, instead of other models.

And the reason is what’s the incentive to take it off? There is none. The incentive is to sell them a bigger, better system. And this is a business decision.

So, those who are in the PPA model have an opportunity and a link to a client to say, gosh, wouldn’t you like to save more energy? I’ve got a cell that instead of going 200 watts per square foot it’s 400 watts per square foot, and it’s only another $14 a month.

Now, it doesn’t matter to you, the building has been built, it may have been there 7 to 12 years. But

the incentive is not to take them off. The incentive is this is a connection to the consumer, who is going to buy more stuff from me.

And I think we don't understand that model, yet, but I don't think we have the right perception of the model, either, because we're thinking, oh, it's a lease, they could walk away any time.

MS. BROOK: Right, right, right, okay.

MR. HODGSON: Show me the data that either way is occurring. But I think we need to talk to the industry as they're moving towards that model, which is now the dominant model in the industry, both residential retrofit and residential new.

MS. BROOK: Okay.

MS. GUPTA: Just again to add to that, that the idea to bring up these things is just as a State agency, when you're putting out codes you want to make sure of the bigger picture of where it's going. You don't want to, again, not inadvertently incentivize a larger system because you want to look at, well, why do you do ZNEs. For meeting the GHG goals, you know, looking at the higher goals of -- you don't want to send it into a direction, even like in a short term that it would be hard to sort of recant back from.

So, making sure that whatever thing is being put

into place has that long-term vision inside, and is going towards that direction.

MS. BROOK: Okay.

MR. SHIRAKH: Okay, any others? Next, please.

So, this is a table that, you know, I generated using CBECC and the PV Calculator. It's for the 2,100 square foot prototype, single story, 90 degrees orientation, which is due east.

And, basically, the numbers in those columns are the kW PV, DCPV that you need to trade off.

One option would be to look at this and, let's say for a high-performance wall we say you need about half a kilowatt prescriptively, so .41 is the highest number there.

And there's .83 is the highest number. Again, climate zone 15 level requirements, that could become the prescriptive requirement, something like that.

But, essentially, what you have here is, depending on the climate zone, as low as 340 kW system to a high of 1.2 kW for climate zone 15.

And what's also interesting here in the milder climate zones, you get more savings from the walls.

In the harsher cooling climate zones, you get more savings from high-performance attics.

So, again, you know, this is based on east,

which is the worst orientation and it seems like the amount of PV you need for a tradeoff is fairly modest in most climate zones.

So, a minimum 2 kW system would probably be sufficient.

(Off-mic comment)

MR. SHIRAKH: And, yeah, this --

MS. GUPTA: Well, I think a clarification on that. So, when you say 2 kW that calculation is for this 2,100 square foot prototype, only.

MR. SHIRAKH: It will change.

MS. GUPTA: And will that scale with the --

MR. SHIRAKH: It has to scale with the size of the home, yes.

We have to probably come up with some kind of a regression equation and then run some more runs, and then come up with, you know, maybe BINS or, you know, some other method to capture it.

Because the size definitely varies with the size of the home, but it’s not linear. I mean, the energy usage is not totally linear compared to -- so we have to capture that.

MS. BROOK: So, what you’re saying is that there might be a higher minimum for larger houses than --

MR. SHIRAKH: Right.

MS. BROOK: If we did this math and came up with any number bigger than 2, then we'd have to increase the minimum requirement.

MR. SHIRAKH: Right.

MS. BROOK: Okay.

MR. SHIRAKH: Like, you know, if somebody's building a 3,000 square foot home, then obviously the PV requirement goes up. But it's not linear, you know, it tapers off.

MS. BROOK: Okay.

MR. SHIRAKH: Because the plug loads are different and everything else.

Jon?

MR. MC HUGH: So, what you're showing right now is something that looks fairly prescriptive. But if you're implementing this in the performance approach, and maybe you're just trying to show what the general sizes are but --

MS. BROOK: That's right.

MR. MC HUGH: -- just to clarify I'm assuming that you'd say, you know, there's so many kilowatt hours, or TDV KBtu per kW of PL and we're going to run the simulation based on, you know, it having all the HPW and HPA, and then you took them out, or are you still at a lower TDV than you would be?

This is just to kind of help people see that 2 kW more than takes care of the --

MR. SHIRAKH: That's exactly the point.

MR. MC HUGH: Okay, thanks.

MR. SHIRAKH: So, any questions on this table?

MR. HUNT: Yeah, this is Marshall Hunt, PG&E. But windows aren't in here?

MR. SHIRAKH: No, this is just for HPA and HPW. I did not consider the --

MR. HUNT: It gets much more complicated.

MR. SHIRAKH: Yeah, it gets more complicated.

MS. GUPTA: So, again, Mazi, just to --

MR. SHIRAKH: So, I mean another way of doing this is maybe limiting the windows area to 30 percent and then running this, and then adding another column based on the --

MR. RAYMER: Well, it would make for an easy prescriptive measure.

MR. SHIRAKH: Yeah, I can do that.

MR. RAYMER: Yeah.

MS. GUPTA: Mazi, just one additional thing. So, is the key factor in not going to a performance-based PV approach the fact that there is not a calculation engine that's open source? Because what I'm seeing here is that there's a lot more complication and

layers that are being added to try to come up with the tradeoff more so than if it were a clean, performance-based tradeoff.

So, is the key factor just not having an open source?

MR. SHIRAKH: It's an open source and also it's, I think, a resource issue for us. Maybe Farhad can talk to that.

The PV Calculator would basically need to be updated constantly as new products come in, so it's a maintenance issue.

MS. BROOK: Well, the other thing, though, I think that we're kind of confusing things a little bit. I think this is really just illustrative.

Because we're not really -- we're not doing any sidebar calculations except -- the only thing that we're suggesting is that we somehow summarize all of the -- all of the results that come out of the PV Calculator and kind of put it into a matrix approach to look up by climate zone and PV system pipe, what's the generation of kWh or kW, whatever the metric is, right.

MS. GUPTA: Then I don't want to beleaguer this, but the fact that, you know, a PV system's going in a single home, on different roofs, there's so many different variations to configurations there.

MS. BROOK: Right.

MS. GUPTA: To can them into a simplistic straight disincentives the industry from, you know --

MS. BROOK: But what I'm saying, what I'm trying to communicate is because of this -- those numbers are so low, and we already have a 2 kW minimum, why are we going to gnat's ass detail in calculating performance credits?

I can see it for the whole building score, but not for this credit tradeoff. It seems like overkill.

MR. SHIRAKH: I'm using 90 degrees orientation which is worse than the worse. I mean 110 should be -- they suggest that the solar ray zone is between 110 and 270. So, I'm not even using 110. I'm using 90.

MR. RAYMER: This is conservative.

MR. SHIRAKH: This is very conservative. So, if we make this the basis of the prescriptive standards, we don't have to worry about other orientations. I mean this is the worst.

So, I think it is possible to come up with a clean prescriptive alternative.

MS. BROOK: And I guess my strong opinion is that our credit -- our limitations of what we're trying to accomplish as far as the tradeoff that's going to be the constraint. It's not going to be the performance of

the PV system.

Do you see what I mean, we're saying --

MS. GUPTA: No, the --

MS. BROOK: Because if you do a 2 kW minimum, the worst performing PV panel and the worst orientation, you're still going to have enough generation to take care of the tradeoff that we're trying to limit on the efficiency side.

MS. GUPTA: No, no, totally agree with the safeguarding, the efficiency is definitely the high priority.

But just, again, looking forward and what you're setting into motion for the future in terms of the integration of, you know, distributed generation is what -- to set into motion a process and, you know, a thing in the market that can -- that you can have a continuum on rather than --

MS. BROOK: I think you've got a really good point and I think it's extremely applicable to Mike's request for this whole building metric that's as close to best practice calculations as possible, and that matches the national rating schemes as close as possible.

That's where I would agree with you. But the biggest constraint there is that we don't have an easily

supported ability to have an open source tool that does the hourly PV calculations.

MR. SHIRAKH: Any other questions on this table? Online?

Okay, so we can go to the next option which is the advanced whole house fans.

This idea is even less baked than our PV proposal, but it is an idea, so we're floating it.

In the 2013 Standards we required a whole house fan in climate zones 8 through 14 so that's the first time that we had some recognition for night ventilation and whole house fans.

We had to degrade the performance of the whole house fan by about 75 percent because of certain perceived shortcomings of these devices, which is they tend to be very noisy. And I can attest to that in my own home.

You know, they tend to be one large central fan, and it's hard to have like local zonal controls, like you can just do one or two rooms.

And they pose some security issues because a lot of doors and windows have to be open.

And again, for those reasons the performance was downgraded by 75 percent.

And then we allowed central fan integrated

ventilation systems as alternatives in climate zones 8 through 14. And, actually, even if you installed these devices you can get a credit on top of meeting the basic prescriptive requirements.

So, the next slide, please. So, the idea is to go to this quieter, decentralized whole house fan that can also have some automation associated with them, and provide a credit that would be above and beyond just the prescriptive requirement. Perhaps analogous to the central fan systems that I previously described.

And, you know, you can do different zones. You know, if only one occupant wants to do one room and not the rest of the house, you have that option with them so you get more benefit from that. And there's probably less security concern.

So, we haven't really calculated the level of credit, but that's basically the idea.

Bruce Wilcox is online. I don't know if you have any additional comments on this, Bruce?

We're going to unmute you. So, you're unmuted, Bruce.

MR. WILCOX: Yeah, I think you covered the issues. I'll be glad to answer any questions about the issues involved, if required.

MR. SHIRAKH: So, any questions on this whole

house fan credit? So, Mike and Bob are competing. Bob, you go first.

MR. RAYMER: Bob Raymer with CBI. So, you're just looking at taking the current prescriptive requirement for whole house fans in those zones and sort of updating it to --

MS. BROOK: Well, we're not changing the prescriptive requirements.

MR. SHIRAKH: The prescriptive requirement is not going to change. This would be an additional compliance option.

MR. RAYMER: Oh, okay.

MS. BROOK: Yeah, so the whole house fan is the prescriptive requirement.

MR. RAYMER: So that stays the same. This is now if you do it this way, you're going to get more credit.

MR. SHIRAKH: You get more credit.

MS. BROOK: Yeah.

MR. RAYMER: Fine, yeah.

MR. SHIRAKH: Okay, so Marshall.

MR. HUNT: Marshall Hunt, Pacific Gas & Electric.

So, always the problem with any kind of forced ventilation is what's the natural ventilation case? And

so I understand there is some work being done on that, thinking about how to correct that better. So, do we have any status on that or will that be incorporated?

MS. BROOK: Version 3 CBECC Res.

MR. HUNT: I don't know versions but --

MS. BROOK: So, we're currently at Version 2B and we're going to have a Version 2C bug fix coming out today. And Version 3 is scheduled for early August.

You guys are going to love Version 3, it's a lot of times faster, it's got everything you ever wanted.

(Laughter)

MR. WILCOX: I think I'd like to clarify that.

(Laughter)

MR. WILCOX: No, go ahead.

MR. HUNT: Well, back on that issue, one of the struggles we have with products and with the utilities is everybody know whole house fans can really save energy and increase comfort. And yet, our minders at the CPUC say that it uses more energy than it saves so, yeah --

MR. RAYMER: (Off-mic comment)

MR. HUNT: It's going to be buried in their assumptions about natural ventilation. And the particular group who's running their special model, we need to somehow get them to listen to the Energy

Commission and the research done. So, we'll be looking forward to your help.

The other issue is the dampers. How do we account for the leakage in the winter? Because when we think about dampers and economizers, we think about an amp at standard.

So, is there any talk about how you keep the back flow of cold air in the winter, and things like that in that arena?

MS. BROOK: Yeah, so Bruce, could you speak to that because we did look at that and decided it was relatively insignificant.

MR. SHIRAKH: Right.

MS. BROOK: But if you could clarify that that would be great.

MR. WILCOX: Well, so the simple, traditional whole house fan where the damper is a gravity operated machine that's sitting right there in your hallway, and you can see it. I think we've decided -- well, we account for the added leakage that you get in a typical system like that, and that's built into the model.

So, the heating -- when you put a whole house fan in, your heating energy use goes up in the current model.

I think the situation is somewhat different when

you go to this advanced whole house fan where we're talking about an automated damper that provides inlet air. And that's a much more significant issue, I think, in terms of reliability.

And I don't know of any applicable test methods, Marshall, but if you would like to suggest one I think that would be a very relevant thing to do as part of this measure.

MR. HUNT: This is Marshall Hunt. Yes, we'll get that to you.

MR. WILCOX: Good.

MR. SHIRAKH: Okay, any other questions on --

MR. MC HUGH: Yeah, I've got a couple of questions.

MR. STARK: Let's go to the person online, they've had their hands raised. This is someone named George. George, you're unmuted.

MR. NESBITT: Can you hear me?

MR. STARK: Yeah, we can hear you.

MR. NESBITT: Yes, George Nesbitt, HERS rater. So, on the (inaudible) --

MR. SHIRAKH: George, you're not coming through. We cannot hear you or understand you. You sound like you're at the bottom of a well.

MR. NESBITT: I could call on (inaudible) --

MR. SHIRAKH: Okay, why don't you try that because I know you're -- it's really not understandable.

MR. NESBITT: Yeah, okay, I'll call in.

MR. STARK: Okay. There is Mark Hoeschele is raising his hand but he is -- he is not associated with a specific -- he's not linked his phone to his login, so I'm going to have to unmute the call-in users to find out which one is him.

MS. BROOK: Okay.

MR. STARK: Mark, can you speak up?

MR. HOESCHELE: Yes, this is Mark. Can you hear me?

MR. STARK: Yes, you are call-in user six.

MR. HOESCHELE: Hi, this is Mark Hoeschele. I just want to raise the issue of as we move forward with the standards and improving the overall efficiency of homes, and budgets are coming down, that we pay increasing attention to -- in order not to discourage the implementation of new technologies that we pay attention to and document the performance of the natural ventilation base case. And verify that the way we are modeling it is consistent with reality.

So, I strongly, you know, support additional field research to show that how we're modeling things is accurate.

MR. SHIRAKH: Thank you, Mark.

Jon, did you have a question?

MR. MC HUGH: Yeah, I've got a couple of questions. So, the first one is I look at this picture, it looks like it's an exhaust fan. Do you have a -- is this proposal to have a balanced system where you have a supply fan and an exhaust fan?

MR. SHIRAKH: This is not an exhaust fan.

MR. MC HUGH: That's a supply fan and you're pulling air out of the attic?

MR. SHIRAKH: So, if you look at the right picture, the fan is near the top is, yeah -- yeah, you've got to. Yeah, so it's just pulling air, just like a whole house fan it's just the fan, itself is removed and that's what makes it so quiet. And it's blowing the air into the attic just like a whole house fan.

MR. MC HUGH: Okay, so it's an exhaust fan. So, it's not a balanced system.

MR. SHIRAKH: Right. You still have to open a window.

MR. MC HUGH: Yeah, so you have to open a window so --

MR. SHIRAKH: Or you can have automatic dampers.

MR. STARK: And to be clear, under HVI's

classification, this would be classified as a residential exhaust fan, not a whole house fan, but it is serving the same function as a whole house fan.

MR. MC HUGH: Right. Okay, so why is the security issue less, just because --

MS. BROOK: Well, it’s not in this case, unless they have the inland dampers.

MR. SHIRAKH: If they have the inland dampers it could be -- it’s possible, you know, just to open the windows in one zone and not the entire house.

MR. MC HUGH: The whole house. Well, you can do that with the whole house fan though, too.

MR. SHIRAKH: No, you can’t. You have to have -- I know, because when you have 5,000, 6,000 cfm going you need a lot more. But, you know, you can have these in 2,000 cfm increments and you can just open the door just upstairs or the master bedroom.

MR. MC HUGH: Right. So, are you looking at different credits depending on whether you have some kind of automated damper versus a window?

MR. SHIRAKH: I think an automated damper would definitely get a bigger credit.

MR. MC HUGH: Okay, thank you.

MR. SHIRAKH: But even without it I think you can assume that, you know, these will be more utilized.

The noise, by itself, I think it's a very big issue.

MR. MC HUGH: Right. Okay, thank you.

MR. STARK: George has switched from his handset to a phone, so I'll go ahead and put George back on the line. Then we have someone else in the audience that wants to --

MR. SHIRAKH: If there's somebody in the audience, then we'll go to George.

MR. STARK: Oh, you want to do the audience first, okay.

MR. SHIRAKH: Yeah.

MR. WAHL: Yeah, Andy Wahl, AC Home Performance.

MR. STARK: Raise the mic closer to you.

MR. WAHL: I'm okay with whole house fans with the exception of we need to deal with air ceiling, the crawl spaces because we're pulling the air out of the crawl spaces. The house does go more negative.

And we also have to deal with any kind of open combustion appliances that could flame roll out when these are running. Because the people don't open the windows and they turn enough of these on, and if something like a water heater were to kick on, we could be burning houses down.

I don't know if there's any studies to that or not. But I'm not concerned so much about the combustion

products if we're dragging enough air through the house that it's going to ventilate it, anyway. It's the flame rollout that is a bigger concern. Thank you.

MR. SHIRAKH: Thank you.

MR. STARK: All right, George, you are unmuted.

MR. NESBITT: Yes, can you hear me?

MR. STARK: Yes, we can hear you. You sound clearer now.

MR. NESBITT: George Nesbitt, HERS rater.

So, if I understand this, so currently under 2013 you get credit for a traditional whole house fan. You get more credit for a central integrated fan, whole house fan.

MR. SHIRAKH: Right.

MR. NESBITT: Correct. So, is this proposal then that a sort of distributed central house fan would get more credit than a central?

MR. SHIRAKH: So, I think the slide says there has to be at least two of these fans. And, practically, the way that the cfm of these units are generated lower than the central, so in most homes to meet the requirements you'd probably need at least two of them.

So, that would be one requirement is to have multiple units.

MR. NESBITT: So, would the credit be equal to a

central fan integrated, would it be more, would it be less?

MR. SHIRAKH: That's what we're -- you know, we have to model it. But, you know, it's going to be similar to that. It's going to provide additional credit. You know, where it's exactly going to land I don't know at this point.

MR. NESBITT: Okay. It does seem that I think whether it's a distributed whole house fan or even a traditional whole house fan we may want to consider requiring makeup air. And, you know, I believe that's been done at times with even things like swamp coolers, rather than, you know, pressurizing the house completely and actually having some sort of, you know, automatic relief just because of the --

MR. SHIRAKH: Well, with these fans you just open a window or two and you don't need a supply air. And you still could create an imbalance if you use a swamp because the cfms will have to match and who's going to make sure that that's taking place?

MR. NESBITT: Oh, I think some of these systems that are distributed, I do think come with automatic -- you know, have a makeup air.

MR. SHIRAKH: There is homes in Stockton that Bruce Wilcox retrofitted that come with automatic

louvers. It is a choice but, you know, some people think they're ugly, too.

So, we're not imposing that as a requirement. But, you know, if somebody wants to do it then I didn't think it looked that bad, actually, but it's a personal preference. But we're not making that a requirement for this compliance option.

MR. NESBITT: Okay, in that sense I think that it would make sense to give it less credit than a central fan integrated.

Maybe if you have the option of having integrated makeup air then it would get as much credit.

Although, you know, there again I think, you know, how much research or data do we have comparing the three different types of whole house fan systems and their relative savings benefits and costs.

MR. SHIRAKH: Yeah, and we'll be looking at the amount of credit. When Bruce Wilcox is not buried with 2013 stuff that's what he'll be doing.

Any other questions?

MR. STARK: Mark Hoeschele still has his hand up. I don't know if that's a -- if he has an additional comment. I'm going to unmute his line.

Mark, do you have an additional comment?

MR. SHIRAKH: I think this was from before,

okay.

MR. STARK: We do have a comment, then, from Roger LeBrun. LeBrun, you should be unmuted.

MR. LE BRUN: Yes, if you can hear me?

MR. STARK: Yes.

MR. LE BRUN: I am calling because we have done some studies -- a recent study about the relative value of whole house fans versus vented skylights. And it seems like some of the negative features that were raised about the whole house fan and the negative pressurization would not be an issue for the vented skylight that would be self-regulating.

But I referenced a study and that study proved that in a two-story house, with a proper location of a skylight, it can actually do the same job as a whole house fan with less energy consumption over the course of a year.

MR. SHIRAKH: If you have that data can you --

MR. LE BRUN: We wondered if you had considered that as an alternative.

MR. SHIRAKH: No, I have not. But can you send us that information?

MR. LE BRUN: Yes, I'd be happy to. To your attention?

MR. SHIRAKH: Yes.

MR. LE BRUN: Thank you, Mazi.

MR. SHIRAKH: Sure. Other comments on the whole house fan?

MR. STARK: I'm not seeing anyone else with their hand raised.

MR. SHIRAKH: All right, we'll move to the next topic.

MR. STARK: All right.

MS. BROOK: So, we don't have any proposed compliance options for nonres, but if anybody wants to suggest what we should be prioritizing for the 2016 update.

Let's see, what can I say? I know that the variable refrigerant flow manufacturers are working with our CBECC-Com development team to get a compliance option in place for their equipment.

I know that IES also may be working on a compliance option for several technologies. I don't know if you want to talk about that, Craig, or not.

And also, EnergyPro, at least until December has a compliance option for VRF, but they can't use it until they submit it for approval by the Commission.

But I don't know, we haven't, to be honest with you, thought about 2016 for nonres in terms of what additional functionality should be at the top of our

list, but we're very open to suggestions.

MR. SHIRAKH: You know, there was another one you may want to put on your list that CASE teams are working on the thermal cooling compliance option, so that should be there.

MS. BROOK: Okay.

MR. SHIRAKH: Actually, it is an active CASE report that they're working on.

MS. BROOK: Okay. And, hopefully, they're using CBECC-Com to do that analysis and then we could integrate it more seamlessly.

MR. HIGA: Randall Higa, Southern California Edison.

My recollection is the CASE team's not doing the software side of the thermally-driven cooling.

MS. BROOK: Okay.

MR. HIGA: Okay. Marshall said -- that's correct.

So, the question is will there be software that will be able to model that compliance option?

MR. SHIRAKH: Well, you know, our hope was that whatever comes of the CASE report can be integrated into the CBECC-Com.

MS. BROOK: Okay, well, it can't be done without resources, right? So, that's really the issue, should

that be at the top of our list for 2016 or are there other technologies that would trump thermal-driven cooling?

Because, basically, to get it into the public domain, API, it has to go through a process where we write the rules for how that system ought to be treated in the compliance analysis, and also we have to write the translation piece between our data model and the open studio, Energy Plus, in order to actually get it to go all the way through the system.

I don’t know, Craig, if you already -- your commercial environment tool already models thermally-driven chillers and we’d want to consider that as a compliance option.

MR. WHEATLEY: Well, we think we might have an issue in the language. Can you describe to me exactly what you mean by thermally-driven cooling?

MR. SHIRAKH: So, thermally-driven cooling is a compliance option designed to take advantage of any waste heat that’s available within the building, or any solar resources, solar thermal resources that might be available that can drive an absorption or an adsorption chiller.

And so, the goal of the compliance option is to come up with the algorithms to capture the benefits of

using the solar fraction and the waste heat that are augmented by natural gas when you drive a thermally -- a chiller. Like it could be a desiccant, it could be absorption or adsorption chiller.

MR. WHEATLEY: I think in the short answer it's yes, then.

MS. BROOK: So, your tool already inherently models that capability and you can talk to anybody here, or any other stakeholders to decide what kind of priority you should put on submitting that as a compliance option to the Energy Commission.

MR. WHEATLEY: Well, and data -- in this space where it's actually seeking from the customers of what they want us to do, first. So, yeah, that sounds like a great idea to me, but I'll let them decide.

MS. BROOK: Okay.

MR. SHIRAKH: This could also be an element of combined heat and power in it, too.

MR. WHEATLEY: And that's something else we could do, as well.

MR. STARK: I do see a couple of people with their hand raised. George, do you have a comment on this topic? I'm not hearing --

MR. NESBITT: Sorry. I had myself on mute.

MR. STARK: All right.

MR. NESBITT: Yeah, George Nesbitt, HERS rater. An issue I brought up in the 2013 process multiple times is HERS verification for nonres.

It's been my experience working on multiple high rise, multi-family projects that insulation is installed as poorly has it has been in low-rise residential all along.

Also, things like building air leakage. Apparently it doesn't matter in large buildings, but we do account for it in low-rise residential.

Duct testing, you know, and anything else that's appropriate, those should be there. Especially for high-rise multi-family because there's just really -- it's a lot harder to get credit in high-rise multi-family.

And the precedence is we've been doing high-rise multi-family verifications in the utility rebate program. Actually, I've been doing it going back to 2005.

MS. BROOK: So, this is -- George, this is Martha. And my comment's going to make it painfully obvious that I don't know the standards as well as the rest of you.

But are you saying that we ought to be putting this as requirements in our prescriptive standards that

then translate into the baseline for our performance approach or are you just saying that we don't give credits the way we need to give credits in our performance approach for things that are already prescriptive requirements for a high-rise multi-family?

MR. NESBITT: Well, okay, there is virtually no -- there is no credit, HERS credit in nonres, including high-rise multi-family for QII, air leakage, most everything else. So, that's what I'm saying.

It should at least be a compliance option.

MS. BROOK: Okay.

MR. NESBITT: And honestly I think the other issue with nonres is, honestly, high-rise, multi-family does not belong in the nonresidential.

When you model the same building with the exact same assemblies as a low-rise residential and as a high-rise, you go from -- and I'm talking about a heating-dominated climate is what I've typically run it in.

In low-rise residential it's a heating-dominated and central water-heating dominated building.

You know tell the computer it's a high-rise residential project. It now goes to a cooling-dominated building and the energy use intensity doubles.

That's not reality. I think high-rise multi-family probably is a lot more similar to the rest of the

residential than it is to commercial.

MS. BROOK: Okay, thank you.

MR. SHIRAKH: Is it lunchtime already?

MS. BROOK: I'm getting hungry.

MR. STARK: We've got two more hands up but I don't know if they have -- if they're hands that didn't go down earlier, so I don't know if they're --

MS. BROOK: Okay.

MR. STARK: All right, so Roger, you still have your hand up. Do you have a comment on this topic? Roger?

MR. LE BRUN: Oh, I'm sorry. If my hand's still up, I meant to pull it down.

MR. STARK: Okay, no problem.

We have, let's see -- yeah, Mark, what was it, Hoeschele. Your hand is still up. Did you have a comment on this topic?

MR. SHIRAKH: I think it's from before.

MR. STARK: I'm just guessing he doesn't.

We do have a hand up for a David Goldstein. David, you're unmuted.

MR. GOLDSTEIN: Hi, David Goldstein with NRDC. I wanted to echo the comments of the HERS rater just a moment ago that the Commission ought to be looking how to make -- that high-rise model and because it's more

similar to low-rise.

This is something, actually, that RESNET is also looking into from the direction of on a national level. They're starting to issue some guidance on how to change the scope of RESNET Standard 3.1 to include higher value from mixed-use residential.

So, again, there's no reason why a four-story building is found much differently than a three-story building.

MR. SHIRAKH: David, you know, we fundamentally agree with what you're proposing.

We actually -- there was a suggestion to look at this very same issue a few months ago when we were, you know, coming up with the list of our 2016 Standard measures.

This was a resource issue for us because it's easier said than done. You know, there's a lot that has to happen to separate all the high-rise nonresidential and come up with a different set of standards.

And although we agree, it probably will be a 2019 standard rather than a 2016.

MR. GOLDSTEIN: Thanks.

MR. STARK: All right, I am not seeing any additional comments. Let me check the chat log.

We have Greg Towsley, who had a comment on fans,

saying, “health concerns should be also considered”.

Terry McGowan is saying he didn’t see anything specifically about the Title 24 residential lighting proposals on the agenda slides. Will that subject be included at some point?

I don’t believe the residential lighting proposals are a topic in this meeting. That was the workshop on the 21st.

MS. BROOK: This is Martha. I guess just to clarify, historically residential lighting has not been part of the performance compliance budget calculation, so they are, you know, basically mandatory requirements that aren’t included in the performance tradeoff approach that’s implemented through compliance software.

MR. SHIRAKH: Yeah, and for us to make it part of the performance software it has to become a prescriptive measure similar to nonres, with watts per square foot, and so forth.

And, you know, it’s just not a practical thing for residential homes. You know, mandatory measures are more straight forward, it’s easier to enforce and understand, so we’re not going to go there.

MR. STARK: Okay, George is -- he said he raised his hand again, but his hand isn’t raised right now. I’m just going to unmute him to check.

George, did you have an additional comment you wanted to make?

MR. NESBITT: Yes, George Nesbitt, again. I actually raised both the HERS verification, as well as the issue of high-rise multi-family calculating really wrong in the 2013 update.

And, just a reminder, the high-rise multi-family follows the residential lighting for interior unit, as well as the domestic hot water.

So, high-rise multi-family and motel occupancies are already sort of half in, you know, the low-rise residential portion. It’s really the building enclosure that is primarily.

And, you know, primarily they’re residential with a little bit of commercial type central system, you know, maybe on corridors or on some common space. So, they’re really a lot more like low-rise residential than a commercial building.

MS. BROOK: Okay, thanks George.

MR. NETTLER: Can I have a comment on the multi-family?

MS. BROOK: Uh-hum.

MR. NETTLER: It may be the case, or I view the distinction probably more closely related to the mechanical systems. And so, maybe -- so we have this,

the building code has the three-story-or-less thing.

Maybe there could be cases of mid-rise, or high-rise, or four-story, or six-story where the distinction is based on the equipment type. So that it could be handled probably with a minimal of fuss in the current res software.

So, if you had, you know, package sorts of equipment serving individual dwelling units that’s the case where the larger buildings probably could be treated under the regular residential.

MS. BROOK: That’s a very good point, thank you.

And that was Ken Nettler, by the way, if you were curious.

Anything else before we move on?

MR. STARK: George is now raising his hand. I don’t know if that’s a new comment.

MS. BROOK: I can’t tell if George is talking to himself or if he’s talking to us. Just because it says privately and I understand how that’s working by itself.

MR. STARK: As someone explained what that is, that means a message sent by a chat person to us, that is to the podium, as opposed to one that is visible to all of the other people that are in the chat log.

So, this is something that is a message sent to us to let him -- well, here, he put his hand back down

so I'm guessing that was --

MS. BROOK: Okay.

MR. STARK: But I should note, "privately" does not mean non-public. This isn't confidential. It just means one that is only visible to the podium, which is usually he's saying something like we can't hear the speaker or something of that nature.

MS. BROOK: So, I think if I remember this slide deck correctly, we're ready to move to open discussion. But could you just confirm that? Oh, shoot, sorry, not quite yet.

(Laughter)

MS. BROOK: So, the 2016 Reach Code. If you aren't familiar with this, this is Title 24, Part 11. This is voluntary standards -- well, there are some mandatory requirements in Part 11, but the energy chapter of Part 11 is voluntary.

But what we have been doing for several years is establishing Tier 1 and Tier 2 levels of energy performance that then local governments can adopt as mandatory for their jurisdictions.

And, historically, we've always done this based on the performance calculation with our software, where we'd say you're 15 percent or 30 percent better than the base level.

And what we want to do is move to a whole building energy-use-per-square-foot-per-year kind of a metric that's consistent with new and existing building rating schemes. And get everybody started thinking about getting to zero in terms of where you are on this performance scale, rather than a percent better calculation.

So, we will be actually producing this whole building energy use calculation for the 2013 Standards implementation.

But what we'd like to do in 2016 is actually establish what those performance targets ought to be and publish them in the Reach Code, of Tier 1 and Tier 2 categories of the energy chapter of Part 11.

But we haven't done the work to actually say what those targets ought to be, but that's work that we will have to do in this code cycle pretty quickly because it has to stay on track with the Part 11 updates for the 2016 Standards.

MR. STARK: Bob Raymer with CBI. Will this be discussed in more detail at the August 8th, where you're talking about CalGreen update? You've got a workshop planned for --

MR. SHIRAKH: Yeah, it's August 6th.

MR. RAYMER: August 6th.

MS. BROOK: Well, I mean I would say that ideally, yes.

MR. RAYMER: Okay.

MS. BROOK: But, practically, we won't have the work done.

MR. RAYMER: Understood. Maybe we --

MS. BROOK: So, we can talk about whether it's more appropriate to have that meeting after we have the targets established or whether we should just mark on and talk in generalities at that meeting.

MR. RAYMER: There's no rush. In the coming months we'll be raising, not necessarily the issue, you're already very well aware of this, but when a local jurisdiction grabs onto one of the tiers right now, or however you're going to portray this for 2016, they have a statutory requirement, in addition to filing it with the Building Standards Commission and, of course, have to bring it to you with a study, you know, showing cost effectiveness.

Now, as you well know, the CEC doesn't have the authority to look into the cost-effectiveness study.

But if there's a sort of huge change in the way that this information is presented, you know, moving away from 15 percent to something else, to the extent that the CEC over the next couple of years can help sort

of provide local governments and industry with some guidance on what all this means, and how they might want to consider going about doing that cost-effectiveness study.

Because, quite frankly, a lot of these cities and counties, currently, when they go to these tiers, if and when they do, they just simply do it relatively blindly.

And then assume that the CEC's kind of worked this out and then they do very hastily put together a cost impact study.

This could add a little bit more confusion to that. But, once again, I've got to see how it is portrayed. So, yeah, we'll deal with this over the coming months.

MS. BROOK: Okay. I'd say that historically, even though we haven't published the information, we have set the Tier 1 Reach Code in a place where we could defend that it was cost effective. But we haven't done the same thing for Tier 2.

MR. RAYMER: Okay.

MS. BROOK: Because that really is where we would consider it a Reach level of performance.

But we haven't, for better or for worse, published any of that information that anybody could

use.

MR. RAYMER: All right.

MR. HODGSON: Mike Hodgson, ConSol. Are we talking res or nonres, or both here?

MS. BROOK: Both.

MR. HODGSON: Both okay. So, the concern I have on the nonres side is we're benchmarking buildings now with EUIs, using Energy Star Portfolio, and it's not in kTDV per square foot per year.

And so, we're going to be mixing metrics with the same acronym and that seems to me to be quite confusing to the building owner.

So, I'm not sure how we do that or whether you use a different acronym than Energy Star does or --

MS. BROOK: Yeah, yeah, yeah, yeah, so we'll have to make it clear that it's a design rating, or it's an asset rating, or it's something that's not an energy use target, or whatever the Energy Star benchmark term is.

MR. HODGSON: Correct, okay.

MR. HUNT: Hi, Marshall Hunt, PG&E. So, what's your target for 2013, the EIU Reach Code concept?

MS. BROOK: So, we have it on our list to get it -- it's already generated in the compliance software, it's just not published in the compliance documentation.

So, the numbers there we just have to get into the report, so we think we can do it in the next update of the CBECC-Res and CEBECC-Com software tool.

MR. HUNT: Three.

MS. BROOK: So, definitely three for res. I need to check back and see if it's on the version 3 list for nonres.

MR. HUNT: Thank you.

MR. STARK: All right, we have a comment from George, online. All right, George has a hand up and David has a hand up. I'll unmute George, first. George, you are live.

MR. NESBITT: Can you hear me?

MR. STARK: Yes.

MR. NESBITT: Yeah, George Nesbitt, HERS rater. Back in 2008 we spent a lot of time developing the HERS rating system which, according to the Energy Commission's Real Estate Disclosure booklet applies to all single-family, multi-family, existing as well as new homes.

So, I have -- since our goal of zero net energy by 2020 for all homes is our goal, and the way we are defining it and have defined it since 2008 is net zero time dependent value, I propose that our Reach standard or CalGreen should reference the HERS rating system

starting in 2016, or actually 2017, if we're going to get there by 2020.

And nationally, the HERS rating system is really exploding in its use. It's being used to market. More and more builders are committing to using it, they're doing it.

As Mike Hodgson mentioned, I think we really need to -- we really need to get it out on the street.

I proposed, in 2008, that we also be able to calculate a national HERS score for comparison. I don't think we could ever get them the same just because we are using different metrics.

And the other point I'd like to make is I think as long as we've had a performance -- or since 2001 the energy use intensity metric in the Energy Code has always been kBtu per square foot. That is an energy use intensity number.

What we don't have is static parts. They change based on the standard design, which changes based on proposed design. Thanks.

MR. STARK: Okay, I also have David with his hand up. David, you are live.

MR. GOLDSTEIN: Thanks. I wanted to follow up a little bit on Mike Hodgson's comments about the comparability of operational ratings through the EPA

benchmarking system and the asset ratings generated through Title 24.

And I've written this up in detail about asset ratings should not and do not predict operational ratings for any particular building.

Frankly, you want them to be predictive on average. And in order to know if that's right, we need to establish some kind of a feedback group between predictive energy use and metered energy use.

So, I would suggest that the Commission or its staff try to figure what is a crosswalk between a typical building use pattern, what the kTDV is compared to what kBtu sourced energy is.

There shouldn't be that much difference. And since for any individual building you're going to have to explain why my building with my tenants operated the way I did it doesn't exactly agree with the asset rating, it may be more or it may be less. Showing them the difference between TDV and source level (inaudible) is one more reason. It doesn't seem to me to be that troublesome.

MS. BROOK: David, this is Martha. I'm just to ask a question to make sure -- well, because I don't think I understood you completely.

Are you suggesting that we would work out some

scheme where we would adjust a metered energy use number to be equivalent to a TDV calculation in terms of, you know, somehow moving from the rate that they experienced in that meter to what we're assuming is the average consumer time dependent valuation cost of energy?

MR. GOLDSTEIN: Yeah, Martha, something like that. I mean you could do it either way. You could either say based on the modeling if you have a kTDV of a million, on the average you should have a kBtu of 250,000.

Or you could do it the other way, you could say if I have a metered reading that's less than 10 kBtu over all, how much TDV is that likely to be on average.

MS. BROOK: Okay, okay, interesting. Thank you.

MR. GOLDSTEIN: Thank you.

MR. STARK: All right, George, you put your hand back up. Did you have an additional comment to make?

MR. NESBITT: No, sorry, I didn't raise it -- or I didn't lower it, sorry.

MR. STARK: Okay. I believe that's it for the comments that we have online.

I also do not see anything new through chat.

MS. BROOK: Okay. So, I think the next slide is open discussion, which that's Mazi. That's not you guys. That's Mazi's picture.

(Laughter)

MR. SHIRAKH: This is when I was a teenager, when I was cute.

(Laughter)

MS. BROOK: So, I guess just to start this off, maybe we can talk a little bit about if we did this sort of whole building energy use target in 2016 Reach Code, and had it as an available option for the implementation of the standards in case, for some reason that we don't ever expect, the software's not ready in time for the next update.

There's also been discussion about this national ASHRAE. Is it a standard, now, or is it just a recommendation?

MR. MC HUGH: It's out for public review.

MS. BROOK: Yeah, it's a -- do you want to talk a little bit about that and how it might relate or be equivalent to what we're thinking about?

MR. MC HUGH: Sure. This is Jon McHugh, over at McHugh Energy. And this is actually something that I'd submitted to the California Energy Commission for both the residential and nonresidential software.

I think, Martha, in their opening comments had talked about this for the residential software and I think it is just as applicable for the nonresidential

software, which is as part of the process of adoption the Energy Commission does what they call their “Impacts Report”.

And they compare the savings from the proposed new code cycles compared to the last code cycle.

And different from the EUI, this actually is in terms of percent better than the prior standard.

And the idea is that, essentially, during a transition period you can make use of, essentially, those adjustment factors from the prior code cycle to the next code cycle.

And since you’re only looking at one code cycle, you know, the numbers are relatively small as compared to the ASHRAE Addenda BM, which is out for public review.

For whatever reason they chose, they’re actually looking at using the 2004 baseline, you know, so it’s a code that’s ten years old as compared to something, you know, potentially for 2016.

So, you know, there’s been 12 years and actually a substantial number of different areas that are now regulated, such as computer rooms, and process loads.

And so, that actually, I think, is a larger lift than what I’ve suggested as an interim process between software, which would essentially do two things.

One, it would adopt or implement in the software, early on, all of the mandatory measures. So, those are things that aren't necessarily directly modeled, but have to be captured in terms of forms, and that sort of thing that, yes, I did do all those mandatory measures that are, you know, generated by the software.

And then, until all of the new rules are developed to actually allow that, let's say, you know, the new code is 10 percent more stringent.

So, as a result you would take the old software, and in this case when you're talking about the 2013 software, say that if you exceed or if your energy consumption -- or TDV energy consumption is less than 90 percent of the 2013 value, then you're good.

And that this would be the case until you actually have the new software that actually implements all of those rule sets.

And so, it allows for two things. One is potentially a less chaotic adjustment between code cycles.

And the other thing is early compliance so that builders and other folks could, you know, potentially have incentive programs that say, you know, yeah, we're still in a 2013 code cycle. But if I adopt early 2017,

would you offer me some money to do that?

And it sounds like Bob wants to say something.

MR. RAYMER: Well, I assume that's -- this is Bob Raymer, CBI.

I assume that's what Martha was sort of referring to at the beginning of today's meeting.

That, you know, as we're developing updated software you've got this sort of nice -- I don't want to say off ramp, but you've got a nice parallel track where using existing one, do a percentage, and boom there you go.

MS. BROOK: Yeah, and I guess the thing we need to keep thinking about and deciding is if it's better to do it on a percent better basis or the equivalent full building EUI basis.

I think they have the same problems, right? The fact is that when we do that determination of how much better a current -- the next code update's going to be than the existing one, it's an average value, right.

And we've prided ourselves that our performance approach is building-specific and that you're doing everything on a per-building basis.

And so that -- if it's percent better or if it's a fixed EUI that represents a percent better, you're still going to have the problem that sometimes it's

going to work out for the building to be pretty close what we would expect that building to be for the next code update. Sometimes it's not.

And I guess what we're saying is that because it's an interim process and it's this transition, we're okay with that lack of purity in our performance approach.

We know we're going to get it wrong sometimes and sometimes it's going to be easier to comply with and sometimes it's going to be harder to comply with that fixed number than it will be when we get the new software in place.

MR. MC HUGH: So, just to reply about percent better and EUI being -- I know that there's been a lot of interest. You know, Charles Eley had written this whole thing about the zEPI standard, et cetera.

But the issue is that the percent better really talks about what is the change to the rule set that -- so, when I look at percent better, I'm saying that I have modeled in my software the geometry, the kinds of occupancies, et cetera and I actually have a fairly detailed rule set about the base consumption.

And the EUI actually kind of throw that out because, you know, unless you have this huge table that's a million cells large --

MS. BROOK: Right, right, agreed.

MR. MC HUGH: So, to me, I actually don't think that they're comparable. That a percent better actually is --

MS. BROOK: It does the building-specific thing better.

MR. MC HUGH: Right. Now, that being said, the percent better, I'm presuming we'd still do something that's similar to what ASHRAE's done for BM, which is to look at by building type and by climate zone.

So, it's still a matrix, but still, you know, it's 11 by 16. Not, you know, all of the various permutations that you'd have with the EUI.

MS. BROOK: Right. Go ahead, Ken.

MR. NETTLER: So, on this issue of -- Ken Nettler with EnerCom -- of a transition method or a way that we all agree that you could move forward on software, I'd just like to point out what's probably obvious. It's that nowadays things are so interconnected. It's not just software. It's HERS verification. It's the forms.

How one of Bob's members would deal with something after the standard goes on, would they still be allowed to go back and do 15, or whatever the number was, of some older version of software?

Well, my point is especially this particular code cycle. There were major changes to all of these legs of the stool. And so just be careful about saying it's only one thing, like software.

MS. BROOK: Okay.

MR. NETTLER: Somebody has to think through how the verification works.

MS. BROOK: Right.

MR. NETTLER: And the final thing on the software is the last couple of cycles we've introduced technology that wasn't in the software before. You know, like whole house fans. Let's say this time maybe it's advanced things, and so there will be some awkwardness occasionally when you're looking for capabilities that might not be in the current software.

MS. BROOK: Right, right.

MR. MC HUGH: Yeah, new measures you can't avoid, right. I mean that's --

MR. NETTLER: You understand we need a process that accommodates it. That's all I wanted to say.

MS. BROOK: You're right. And I think from CEC staff's perspective, we have to find that delicate balance between spending very limited resources on working out this thing we hope we never have to use, right.

Because if we want this thing to be legitimate, we have to spend some time thinking through all the issues and doing it right.

But it's really a fallback position for when the software's not ready, right, which we don't ever want to have happen again, right.

So, anyway, it's going to be a delicate balance to figure out where we land there, to be honest with you. That's just my opinion.

MR. MC HUGH: So, I'd just like to point out that there's still a lot of things that are still the same. Because all of the mandatory measures, you still have to address those sorts of things. All of the form generation you still have to address.

MS. BROOK: Right, right.

MR. MC HUGH: And so, what we're really talking about is the stuff that's under the hood for the prescriptive measures and those tradeoffs.

MS. BROOK: Okay.

MR. MC HUGH: But it's not going to be easy, right.

MS. BROOK: The other thing that came to mind for me is that we are trying our best to also open the software up so it's more easily used by the utility incentive programs, for their incentive calculations.

And I think we've succeeded in that, to a large degree, with the California Advanced Home Program, where Version 3 is going to have the CAP calculations in it, and the special data tab we go to, to do your math to see what your incentive calculation is.

That will be available to all vendors' software, also.

Well, doesn't it sort of make sense that if we're doing this sort of transition thing and a Reach Code, that we would use the same metric? So, maybe we talk about a CAP score metric instead of -- anyway, it's sort of ironic because they wanted to do the CAP calculations based on the HERS score, but then we told them that we can't use the HERS score because a lot of the other regulatory issues with using that.

And so, I think they would want to work with us on doing something that sort of is seamless between incentive programs and code requirements in this sort of calculation space.

MS. BROOK: Sorry, I've been warned that I am not following the --

(Laughter)

MS. BROOK: Somebody else can repeat it. It's a test.

MR. RAYMER: Bob Raymer with CBI. Since I'm

going to be asked tomorrow, when do you foresee the next version of CBECC being certified, August or when?

MS. BROOK: So, we actually have a meeting this afternoon to nail down that schedule, but we're trying to hit an early August date.

MR. RAYMER: Cool, thank you.

MR. STARK: George, I see that your hand's up again. I'm going to unmute you.

George, you are unmuted.

MR. NESBITT: Can you hear me?

MR. STARK: Yes.

MR. NESBITT: Yes, George Nesbitt. Sort of to follow up on what Jon was talking about in change of code cycle, what CTAC, the California Tax Credit Allocation Committee, which doles out Federal tax credits for affordable housing did is for the submissions for funding through the first half of 2014, what they did is they based their energy points on 2008 energy code, but increased the percentage better.

I haven't seen any proposal on what they're going to do now that 2013 code is in effect. And, of course, they're funding projects that aren't pulling permits until they hit 2013 code which, you know, means rerunning things.

So, I think we have -- you know, we could have

done that rather than delaying the 2013 code, but chose not to. I think that is a possibility.

I think there's nothing wrong with percentage above code, per se. I think the issue is that the code basis changes so much based on your building, now. In 2013 we've buttoned that down a little bit.

The HERS rating score is really, and CAP score, I mean all of these are really all percentage above some baseline.

Nationally, it's now the 2006 IECC. And for California it's the 2008 Energy Code.

But I mean, I think, you know, the question is when we hit 2020, if everything's supposed to be zero, that is actually 100 percent above 2008 code, you know, maybe it's percentage above is not relevant.

And as we up each cycle, tiers need to have lower percentage thresholds because it does become harder and harder to hit a certain percentage above.

And then, I'd actually like to go back to the PV because Mazi -- Mazi changed slides, but he changed topics, so I didn't get to raise my hand in time.

I just wanted to say that I think we have to remember that PV is not an efficiency measure. It's a power generation alternative. And there's a lot of -- that people actually increase their electrical use

because of net metering and time-of-use rates, and the way that's structured currently.

And I think in the context of net zero energy by 2020 obviously PV has to become part of the Energy Code calculation. That's the only way you'll get to net zero TDV.

Currently, the NSHP calculator is how we do it. It's how we do it for HERS ratings. It's how we do it in the NSHP program. It's written into the standards. It could be implemented into CBECC and it's going to have to be, as well as the HERS rating system.

And, you know, as Mike Hodgson said, there's a lot of projects out there that are in an NSHP. We're doing the verifications. We're doing those calculations. We can account for differences in performance, and shading, and module efficiency.

Verifying a PV system is relatively simple and quick.

And yes we, as HERS raters, do find systems that have wiring problems and aren't working right. So, it is quite valuable.

And so, we really need to start implementing the HERS rating system now and make whatever changes we do need to make to it. But, you know, it is -- the California Energy Commission adopted it in 2008, so it

is regulation and we should be using it.

MS. BROOK: Okay, George, yeah, thank you. And we largely agree with you. We are just having trouble with timing, right, because these standards updates keep marching along and we're having trouble finding the resources to get a HERS rulemaking underway that would allow us to make modifications for us to actually integrate a HERS design rating into our compliance process.

MR. NESBITT: I can write a blank check.

MS. BROOK: Okay, no, I'd like that. That sounds really good.

MR. NESBITT: It will bounce but --

MS. BROOK: No, no, no, no. I thought you were going to write a check to me. And I didn't know it was going to bounce, though. I don't want it anymore.

(Laughter)

MR. NESBITT: Well, I think we do have resources. I think one of them that I notice is that we have needs to support and develop the Energy Code, and the HERS rating system. And then we have research money, PIER and EPIC, and there's still not always alignment.

And there is money and there's stuff going on and perhaps, you know, even within the Commission it

could be better coordinated.

MS. BROOK: Okay, yeah, agreed.

MR. SHIRAKH: Well, thank you, George. You're breaking up again.

MS. BROOK: Do we want to -- does anybody else have a topic for open discussion that they want to bring forward?

I do have another topic I want to introduce, but I don't want to hog the discussion period. So, if anybody wants to bring something forward, now would be a good time.

Nobody, nobody, okay.

So, now I'm going to ask Randall to step up.

I wanted to just kind of revisit our original vision for this open source software for code compliance really was that we would get to a place where there's more of a collaboration for the support and development of the software.

And, I mean I think we have, you know, some examples like the CAP program participation. Basically, we had the CAP consultants learn our rule set, and make modifications for our rule set, and they developed a screen for the CBECC-Res interface that, basically, it's a really good example of that collaborative process.

I mean, ideally, we get to a place where, you

know, vendors are learning our rule set and making contributions to our rule set, and all interested parties have that same option. And people are seeing the value of making modifications for a body of rule sets for additional policy applications.

And I just wanted to introduce Randall and let him speak to this topic a little bit because I think he's beginning to poke at this. And from his perspective, maybe he can tell us what he's doing.

MR. HIGA: Thanks Martha. This is Randall Higa, Southern California Edison.

I just want to preface this by saying, you know, this is something that is in a very sort of high level sort of area where we're still sort of thinking about what the scope of this endeavor would be.

So, what I'm trying to do is have a study done that will sort of map out what Martha was talking about. You know, what are we going to do with compliance software, and not just compliance software, but energy building modeling in general, you know, going forward.

So, my plan is to get under contract that study by the end of the year, so there will be an RFP being issued. So, if anybody's interested, first of all please contact me.

And like I say, we're still developing the

scope. But the idea is look long term, as well as short term. I think we still want to take a look at what we can do, should do for 2016, but maybe 2019 for sure because that's when the residential ZNE requirements are in place. So, it's going to be residential and nonresidential.

But also, look towards nonresidential ZNE in 2030.

You know, one of the options that is being looked at is to open up the software development maintenance, ongoing operation in an environment that's fully open and public. And it may not be something that is housed directly under the California Energy Commission.

Certainly, as far as compliance software goes, it will be under the direction of the CEC.

But the actual IT processes, the contracting, and whatnot could be in some sort of third party, maybe NGO, a nonprofit organization, or whatever. You know, I mean that certainly has to be looked at, where is the best place to house that.

And the idea would be to allow for funding from a number of different sources. But, you know, again with the key thing is to keep it public and open.

But also, encourage and solicit a lot of new

input to the development, maintenance, improvements of the software so that, you know, we can develop some sort of environment that would attract the best and the brightest to come and support software development.

Again, this is sort of a long term thing. And again, looking at how it may deal with such things as, you know, operational versus asset rating type analysis, to what extent should it be predictive? How does it sort of come together with benchmarking, building labeling, and all these other things that are sort of on the horizon, HERS ratings, of course.

And, of course, you know, how it would work with the utility incentive programs.

So, there’s a lot of moving parts and pieces to this. There always has been.

And one thought is how do we sort of, you know, maybe house this in a better environment to make it work better for everybody.

MS. BROOK: Great.

MR. HIGA: So, anyway, I’ll just leave it at that for now, if there are any questions or input. Like I say, you know, if you have any thoughts or input, you could contact me offline, too.

MS. BROOK: Yeah, and this is important to the Energy Commission because we really need to see a long-

term plan where we can understand that our resources are sufficient to do all the things that we want to do.

And, you know, just hearing about what some of the things are that you guys want us to do in the 2016 update, I know already we have resource constraints that are going to make that difficult.

And so, it just seems to me that we're in a position where we have more, and more, and more requirements and derivative policy things that happen with this core kind of compliance software piece. We have to acknowledge that in sort of a holistic way in order to best fund it and best understand how we kind of move from where we are now to where we want to be in the future.

And then the other thing that's always bugging me is that, with maybe a couple of exceptions, we're all sort of at the last half of our professional careers. And how do we get the people that are just entering the building industry, you know, the smart people that we're hiring and that we want to hire to get into this field and to take it forward into the next generations.

I just think we have an obligation to kind of work on that. And this sort of a collaborative option, where we bring in, you know, universities and colleges to participate with us could be very, very productive.

But we need -- we don't even have the time to think about it right now, and that's the thing that's frustrating is that we would like to have some help, you know, with this strategic planning, and I think it could benefit all of us.

MR. SHIRAKH: I'm not adding to it.

(Laughter)

MS. BROOK: Well, so we're pretty much at the end of our agenda. And if we don't have additional input, then this would be a great time to stop. And we could actually have lunch, which, at least for the last couple of days, is sort of a novelty here at the Commission.

So, if there are no other comments, we really appreciate your participation.

And Jon wants to say something.

MR. MC HUGH: Yeah, and I'd just like to just provide some kudos for the team here. I mean they've done an incredible lift this code cycle.

I think about, you know, the basis of the Title 24 simulation tool was using, you know, DOE 2.1e, which I think was released about the time I was in graduate school, about 25 years ago.

And so, we have been using, you know, all these years what I call is sort of a fly that was kind of

captured in amber. And we had all these colluges that were around that basic core.

So, I just want to, you know, really recognize Martha and the rest of the team that's been working on this.

I know it's the CEC and folks that have been doing this. So, anyway, I just wanted to say that and thank you.

MS. BROOK: Okay, so we do rely and depend on your participation going forward. And as you can tell, we aren't as far along in providing specific recommendations as we would like to.

So, any contributions you can make would be appreciated.

And have a great day and I'm sure I'll be talking to you all soon. Thanks.

(Thereupon, the Workshop was adjourned at 12:05 p.m.)

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