

STATE OF CALIFORNIA - THE RESOURCES AGENCY
BEFORE THE
CALIFORNIA ENERGY COMMISSION (CEC)

In the matter of,)
) Docket No. 10-BSTD-01
)
Draft 2013 Building Energy)
Efficiency Standards)
Revisions for Residential and)
Nonresidential Buildings _____)

Staff Workshop

CALIFORNIA ENERGY COMMISSION
HEARING ROOM A
1516 NINTH STREET
SACRAMENTO, CALIFORNIA

WEDNESDAY, AUGUST 23, 2011

9:05 A.M.

Reported by:
Kent Odell

APPEARANCES

STAFF AND PRESENTERS

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Martha Brook

Patrick Saxton

John Proctor

Bruce Wilcox

Gary Flamm

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Ron Yasny

Public Comment

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Mike Gabel, Gabel Associates

Mike Keesee, SMUD

Cathy Chappell, Heschong Mahone Group

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P R O C E E D I N G S

1
2 AUGUST 23, 2011

9:05 A.M.

3 MR. SHIRAKH: I have this sign-in sheet here.
4 I'm going to put it up there, if you guys kindly can
5 either staple your business card or write your name and
6 other information, I would appreciate it, so we know
7 who's here.

8 There are copies of the agenda up there on the
9 front desk, if anybody wants it.

10 This is Mazi Shirakh. To my left is Bruce
11 Wilcox, Patrick Saxton and Martha Brook, and we're going
12 to be making the bulk of the presentations today.

13 This is our last scheduled workshop for the 2013
14 standards before the draft standards are released. We
15 have a number of topics today to be presented; the first
16 one's going to be the treatment of photovoltaics in the
17 2013 standards.

18 And after that Patrick will present the builder
19 supply, appliances.

20 And after that, about 10:15, John Proctor will
21 talk about residential air conditioning refrigerant
22 charge.

23 And about 11:00 Bruce Wilcox will be talking
24 about residential mechanical ventilation.

25 And before lunch Gary Flamm and myself will be

1 talking about the administrative changes in the
2 standards. These are mostly changes to the Sections 10-
3 103 through 10-114.

4 And we'll also be talking about possibly
5 changing the numbering of the subsections of the
6 standards, so our familiar sections 150, 152, 153 and
7 all that will be changing. And we'll discuss the reason
8 why we're doing this and it's primarily because we ran
9 out of sections in some of the subchapters, and we can't
10 add more stuff to it, so we have to do something.

11 Then we'll break for lunch and after lunch Bruce
12 Wilcox will be discussing the Reach Code requirements
13 for both residential and nonresidential buildings.

14 And the last topic of the day will be ducts in
15 conditioned space and John McHugh is going to make a
16 presentation related to that, and this would be an
17 alternative -- including an alternative package for
18 residential buildings.

19 So, what's on the screen is the schedule that
20 everybody saw last week and again, August 23rd, which is
21 today, is the last pre-rulemaking workshop. By the end
22 of September we'll be releasing the draft express terms,
23 which includes the all of part 6 documents, which is the
24 standards, the reference appendices in the ACM manuals.

25 And then we'll also be working on our Impact

1 Analysis Report, form 399, and other measures.

2 October 7th we'll probably hold an Energy
3 Efficiency Committee Workshop and this would be, still,
4 an informal hearing, it's mostly to let our
5 Commissioners know what progress we've made so far and
6 what we're recommending.

7 Other important dates would be December 12th is
8 the -- this would be an Efficiency Committee hearings,
9 which is this would be a part of the formal rulemaking.

10 And the adoption date, currently, is set for
11 March 7th, 2012 at a Business Meeting.

12 So, if you have any specific questions about the
13 schedule, I'd like now, would be happy to answer.

14 Martha, you said one item is missing from the
15 schedule.

16 MS. BROOK: No, this is the right one.

17 MR. SHIRAKH: This is the right one. So, again,
18 you know, you can look at it on your own and ask us any
19 questions, if you want.

20 And so today is the 23rd, let's say how about
21 September 10th, would that work for everyone?

22 And so I'm going to turn it over to Martha for
23 the first presentation on photovoltaics.

24 MS. BROOK: Good morning. This is our -- a new
25 area for the Energy Commission, it will be the first

1 time that we propose to include renewable energy systems
2 in a code-compliance approach for the Building Energy
3 Efficiency Standards.

4 So, our -- that is our goal is to introduce this
5 option. The other thing that's really important to the
6 Energy Commission is that we protect the thermal
7 integrity of the building envelope, so we don't allow a
8 PV system to result in a -- you know, to be used in
9 compliance and to result in a building envelope that
10 doesn't help us get to zero net energy.

11 So, our goal for zero net energy is to do
12 everything possible to reduce the loads of these
13 residential buildings before we focus on the systems to
14 meet those loads and we don't want the -- any kind of a
15 tradeoff, whether it's with efficiency or with renewable
16 energy, to degrade the thermal integrity of that
17 envelope.

18 And then the other goal for the Energy
19 Commission staff is to keep the implementation of this
20 option as simple as possible.

21 It will be -- our proposed approach is to have
22 it a compliance option in the performance standards, so
23 there will be no prescriptive way to meet -- to use PV
24 as a credit to meet a prescriptive budget, it will -- it
25 can only be used in our performance standard compliance

1 approach.

2 So, our proposal is to -- is that the -- you
3 know, that we would model the expected energy
4 performance, energy generation performance of the
5 photovoltaic system in software using the CEC PV
6 calculator that we use now for the new Solar Home
7 Partnership Program, and we would allow that energy to
8 be used to meet part of the performance standards
9 calculated energy budget for the proposed building.

10 So, you know, we haven't settled definitely on
11 these portions that we're proposing here but, you know,
12 we'd like your input on where they should be.

13 We do need to constrain the portion of the
14 energy budget that could be met with solar, again for
15 the reasons I mentioned.

16 So, right now we're sort of setting that as less
17 than or equal to ten percent of the performance budget,
18 with the additional criteria that the thermal integrity
19 of the prescriptive building envelope doesn't degrade
20 more than five percent.

21 And so, then the other thing to mention here is
22 that other renewable energy systems can be considered if
23 and when they can be modeled in our compliance software,
24 so we're not -- we have that ability now, with solar
25 electric systems, and it's not that we're saying that's

1 the only renewable energy systems we'll consider, it's
2 just the one that we can model now.

3 So, if and when other systems can be modeled on
4 our compliance software, they could also be used for
5 this compliance credit.

6 So, really, what we're really mostly thinking
7 about is trying to allow the opportunity for production
8 builders to use solar to meet a portion of their budget,
9 you know, that's created when they don't have optimal
10 orientation for their building, or if they want more
11 expansive views in a certain direction and want more
12 window area in a certain view, without -- but having
13 some pretty strict backstops so that PV can't be used to
14 really blow out all the efficiency measures that we
15 really need to see in these buildings.

16 So, that's basically our proposal and we
17 haven't -- we'll set up the detailed implementation
18 steps in our ACM Reference Manual, and so it will just
19 become part of the rule set for the performance
20 standard.

21 And we're -- I think we're ready to open it up
22 for comments, discussions, questions.

23 MR. RAMER: Thank you, Martha, Bob Ramer, a
24 Senior Engineer with the California Building Industry
25 Association.

1 We certainly want to see the details but as far
2 as the overall goal here is we're very supportive of
3 this. In addition to direct financial incentives, this
4 provides us with another incentive option approach that
5 can help us make the transition to a lot more use of PV,
6 particularly in production housing. So, we think this
7 is a very positive step by the Energy Commission.

8 Thank you. And we look forward to getting the
9 details and to the extent it can be kept as simple as
10 possible, we'd be very supportive of that. Thanks.

11 MS. BROOK: Hold on.

12 MR. SHIRAKH: We'll probably be working on this
13 in the next few days, between next week and now, and
14 we'll let you know about more details.

15 MR. RAMER: Uh-hum, just feel free to bounce
16 anything off of us and, you know, ConSol will be
17 providing advice.

18 MS. BROOK: Right. Well, you mentioned
19 incentives and I think that's what --

20 MR. SAXTON: Yeah, I think right now the working
21 idea would be that if you used PV as part of the
22 compliance that that would probably not work along with
23 the NSHP incentive.

24 MR. RAMER: Uh-hum.

25 MR. SAXTON: That you would have to still look

1 at that 15 percent beyond compliance without including
2 the PV so --

3 MR. RAMER: This provides us with another
4 alternative.

5 MR. SAXTON: Okay.

6 MR. RAMER: And, quite frankly, to some builders
7 getting the new solar home money has been somewhat
8 problematic, there's a lot of bureaucracy with that.
9 This provides them with an alternative option that can
10 be very useful, so we're very supportive of this.

11 MR. SAXTON: Great, thank you.

12 MS. BROOK: Thank you.

13 MR. SHIRAKH: Great, thank you Bob.

14 Mike Gabel?

15 MR. GABEL: Mike Gabel, Gabel Associates. So,
16 when you talk about thermal integrity, you're really
17 talking about all of the energy efficiency measures,
18 including mechanical systems combined; you're not
19 talking about just the envelope, itself, right?

20 MR. SHIRAKH: We're talking about envelope
21 primarily.

22 MS. BROOK: So, that's why we sort of have two
23 different criteria.

24 MR. GABEL: Yeah.

25 MS. BROOK: Everything that you just said would

1 be in the first bullet under the proposal, but there
2 would be a separate criteria that you can't take all
3 that away from the envelope.

4 MR. GABEL: I see. So, the ACM will have to be
5 doing some kind of analysis to figure this out.

6 MS. BROOK: So, we sort of have this idea that
7 there could be loads budget.

8 MR. SHIRAKH: Yeah.

9 MS. BROOK: I mean we're doing the analysis,
10 anyway, to understand that, you know, on an hourly basis
11 so --

12 MR. GABEL: So like Bob just said, I'm
13 interested in the details a lot about how that's going
14 to work in the ACM.

15 MS. BROOK: Uh-huh.

16 MR. GABEL: Because we don't want to sort of
17 create some kind of inadvertent loopholes or strange
18 scenarios.

19 MS. BROOK: Exactly, yeah. So, and go back to
20 our third goal. Yeah, we know it's not going to be
21 simple, necessarily, to implement, but that's still our
22 goal and so we need to think about that, and talk about
23 that with --

24 MR. GABEL: Yeah, and then also on
25 implementation, you know, it's the same sort of issue

1 with F-Chart in solar thermal where closing the loop
2 between what you specify in the drawings and what gets
3 built, I mean you're -- there's a whole other dimension,
4 now, to installation of a whole new feature, and just
5 concerned about sort of putting all the pieces of the
6 puzzle together in the field to make sure everything
7 gets built, you know --

8 MS. BROOK: Right, right.

9 MR. GABEL: So, anyway, just --

10 MS. BROOK: Okay, great. Thanks Mike.

11 MR. SHIRAKH: Thanks Mike.

12 Mr. Keesee?

13 MR. KEESEE: Good morning, Mike Keesee, from
14 SMUD. A question, would you be using the NSHP
15 calculator to determine these TDV values?

16 MS. BROOK: Well, we were intending to use CEC
17 PV.

18 MR. KEESEE: One of the things that we've
19 noticed is that it overstates the production of the PV
20 by about 30 percent versus monitored data --

21 MS. BROOK: Uh-hum, right.

22 MR. KEESEE: -- at least in the SMUD service
23 territory.

24 MS. BROOK: Right.

25 MR. KEESEE: Is that going to be fixed?

1 MS. BROOK: Yeah, you're going to help us,
2 remember? So --

3 MR. KEESEE: I was, okay.

4 MS. BROOK: Yeah, so I mean that's --

5 MR. SHIRAKH: You volunteered with time and
6 money.

7 MR. KEESEE: Oh, that was -- that was Daniel.

8 MR. SHIRAKH: Oh, okay.

9 MR. KEESEE: Excuse me. Okay, I think we would
10 be supportive of this. We'd need to see the details, as
11 well.

12 I guess the thing that I would caution you is
13 going forward I mean it's really, from at least my
14 experience, is that the PV is offsetting your plug
15 loads. That's the real issue here. It's not so much
16 the thermal.

17 MS. BROOK: You're right.

18 MR. KEESEE: I mean it should be recognized as a
19 peak saver --

20 MS. BROOK: Right.

21 MR. KEESEE: -- if it's done properly. But it
22 really isn't and it really is more on the plug load
23 side.

24 MS. BROOK: Okay great, thanks.

25 MR. SHIRAKH: Mike Gabel.

1 MR. GABEL: Mike Gabel, again. Something that
2 Mike Keesee said a while ago and I've heard him speak to
3 this issue, about once you have solar on the roof, solar
4 PV, the perception of the homeowner is that they've got
5 free energy and then their plug loads perhaps go up, and
6 Mike has data on that.

7 I think you need to look at sort of what happens
8 in the real world when you have PV, if that's actually
9 going to drive loads up for some reasons then, again,
10 getting back to the details of how much credit you're
11 going to give for the PV I think is a key component of
12 this.

13 MS. BROOK: Uh-hum, uh-hum.

14 MR. SHIRAKH: Cathy.

15 MS. CHAPPELL: Cathy Chappell, Heschong Mahone
16 Group. Could you follow up a little bit on what Mike
17 said, Mike Keesee, about plug loads and nonregulated
18 loads; is that going to be something that's factored
19 into this or are you still just looking at the regulated
20 loads?

21 MS. BROOK: Okay. For this compliance option
22 we're only looking at regulated loads. But Patrick's
23 going to talk next about another compliance option that
24 looks at builder-supplied appliances.

25 MR. SHIRAKH: Basically, the genesis for this

1 was to come up with some option to -- that can be traded
2 off against the 20 percent overall glazing limit and the
3 five percent west-facing glass, so that's what the
4 origin of this was. So that only includes regulated
5 loads, but that doesn't mean we can't think about plug
6 loads in this.

7 MS. BROOK: So, then the only other thing I
8 wanted to mention is that staff has been talking about
9 this, you know, as an -- and a number of other people
10 have, as well, and that -- you know, we've heard
11 comments from you and others that if we -- if we're
12 moving to zero energy, we do have to include
13 consideration and incorporation of the unregulated
14 loads.

15 And so that's really going to be something that
16 we focus hard on for 2017 to really -- I mean we're
17 trying to do little bits of that now as far as get a --
18 generating a whole house rating as a, you know -- you
19 know, encouraging that and thinking about builder-
20 supplied appliances.

21 But in the future we're going to have to figure
22 out a metric that allows us to think about the rest of
23 the house as we -- you know, as we go towards zero. And
24 how we do that in a building standard is -- you know,
25 it's going to take a little longer to figure out.

1 MR. SHIRAKH: Any other questions on PVs and
2 standards? Anything online?

3 Okay, so we're going to move to the next topic
4 and Patrick is going to talk about the appliances.

5 MR. SAXTON: This topic's actually very
6 analogous to the PV approach, beginning to explore the
7 use of high-efficacy light, residential high-efficacy
8 lighting and builder-supplied appliances, so loads that
9 aren't currently regulated in part six but are a
10 significant source of energy use in the home, and is
11 there some way to begin addressing those as we begin to
12 think about zero net energy.

13 And it turns out there is quite a lot of energy
14 potential savings there but, of course, it's not in the
15 budget calculation right now and it makes it difficult
16 to determine what amounts, again similar to the PV
17 proposal, what amount of tradeoff should be allowed to
18 occur and under what conditions.

19 As we started to look at this, we're trying to
20 build off of the assumptions and usage schedules that
21 are part of the HERS Whole House Program, and that's in
22 Chapter 4 of their manual, and it actually has a table
23 which will describe the hours under basically the duty
24 cycle of the appliances.

25 And so we could get these savings into TDV. We

1 haven't done that, yet, so this analysis has all been
2 done just looking at kilowatt hours.

3 Again, very similar to the PV proposal, how can
4 we introduce these concepts and start moving towards
5 addressing these loads, but not trade away too much
6 against the building envelope?

7 So, the proposal would be that if all high-
8 efficacy lighting and what appliances are supplied by
9 the builder are Energy Star that you could apply about a
10 five percent trade to the general budget. And that may,
11 as we look at what appliances could be supplied by a
12 builder under maybe an upgrade package, perhaps that
13 number would change depending on the appliances that
14 were actually in a home.

15 And we would use the constraint, the same
16 constraint of no more than five percent trade against
17 the envelope.

18 So, some details on what would be required and
19 this is not a hundred percent finalized, either. But
20 the permanently installed interior lighting would be
21 high-efficacy with a vacancy sensor. This would be all
22 the permanently installed lighting.

23 And to make sure that some lighting's actually
24 still installed and it's not just all becomes portable
25 lighting brought in by the homeowner, which has a more

1 probability to be low-efficacy, permanently installed
2 lighting would be required in at least the kitchen,
3 bathrooms, utility room and the garage.

4 Additionally, any builder-supplied ceiling fans
5 would have to be Energy Star, with a light kit, which
6 would have high-efficacy lighting there and offset the
7 probability of someone adding incandescent light kit
8 later.

9 And also along those same lines if this credit
10 was taken, then ceiling mount receptacle or an empty
11 junction box in the ceiling, where it was basically
12 making provisions for the homeowner to add a ceiling fan
13 would disallow this credit.

14 For exterior lighting basically the same
15 approach of high-efficacy and controls, which could be
16 either a photo cell or a time clock, or energy
17 management control system that replicated those
18 functions.

19 On the appliance side, really I think that the
20 one appliance that's almost always supplied by the
21 building would be the dishwasher. And so to get this
22 credit it would have to be an Energy Star dishwasher.

23 And then any additional appliances that were
24 purchased by the homeowner in an upgrade package, or if
25 it happened to be a community that the builder was

1 offering additional appliances as a standard feature, a
2 refrigerator, a freezer, a refrigerator/freezer
3 combination, a clothes washer or, again, ceiling fans
4 those would need to be Energy Star rated as well.

5 Cathy had just asked about the plug loads.
6 Certainly, everyone's aware that it's a significant
7 source of end-use electricity consumption. Various plug
8 load controls are definitely available in the
9 marketplace today.

10 It's unclear how many -- you know, how often
11 those are used. It seems that their penetration rate's
12 quite low. And there is a proposal from the CASE teams
13 to include residential plug load controls.

14 The Energy Commission has some concerns around
15 compliance and enforcement because often those loads
16 will not be there when -- because the homeowner hasn't
17 moved in yet. And also some concerns around the
18 persistence of savings because that's a hundred percent
19 at the whim of the consumer's behavior, they could just
20 unplug it from the controlled receptacle and use an
21 uncontrolled receptacle.

22 So, for this proposal we're not including the
23 plug-load controls, not including any credits, nor any
24 requirements for them and that measure will be
25 considered for the REACH package, for the REACH

1 standards.

2 And that's the end of what I have, so take any
3 questions or comments, please.

4 MR. SHIRAKH: Any questions? Mike Hodgson.

5 MR. HODGSON: Good morning, Mike Hodgson,
6 ConSol, representing CBIA.

7 Just a quick question on appliance package, just
8 so I understand it, if we put in an Energy Star
9 appliance in a production house, or any appliance we put
10 in, all of them have to be Energy Star and we would get
11 a five percent compliance credit. Is that correct?

12 MR. SAXTON: That would -- right now the working
13 concept would be that it's bundled with the high-
14 efficacy lighting.

15 MR. HODGSON: Okay, so you'd have to do both.

16 MR. SAXTON: You'd have to do both, right.

17 MR. HODGSON: Okay.

18 MR. SAXTON: So, right now the idea would be the
19 high-efficacy lighting plus the dishwasher is -- I think
20 that's essentially in a hundred percent of homes or
21 close to a hundred percent of the homes.

22 MR. HODGSON: That's pretty much the only
23 appliance that's being specked right now or being
24 installed as a builder appliance.

25 MR. SAXTON: So that would be a -- that would be

1 a bundled requirement.

2 MR. HODGSON: Okay.

3 MR. SAXTON: And that would be a certain credit.

4 And then possibly, if additional appliances were in an
5 optional package, perhaps there's a different credit and
6 that's a detail that we still need to address.

7 MR. HODGSON: I see. And then the lighting
8 control credit, it seems like most of it seems to be a
9 code, other than the controls for the outside lights.

10 MR. SAXTON: Yeah.

11 MR. HODGSON: And the vacancy control for the
12 inside, so those would be the additional two things that
13 you'd be asking for to get the credit. Is that correct?

14 MR. SAXTON: Yes.

15 MR. HODGSON: Okay.

16 MS. BROOK: If it's all -- it's all high-
17 efficacy, right, isn't --

18 MR. SAXTON: Yeah, any -- it would be any
19 permanently installed, any hard-wired lighting would be
20 high-efficacy plus those controls.

21 MR. HODGSON: Okay, so in the kitchen for
22 example, if you put in -- if you don't follow code -- or
23 you follow code and put in an incandescent over the
24 range hood, which is how we typically install it, then
25 that would eliminate you from getting this credit?

1 MR. SAXTON: Well, yeah. So that might be a --

2 MR. HODGSON: Maybe we want to talk about that.

3 MR. SAXTON: That might be a lamp that needs to
4 have some special consideration, perhaps.

5 MR. HODGSON: Okay, interesting ideas --

6 MR. SAXTON: But your overhead lighting in the
7 kitchen, where you're allowed the 50 percent of the
8 wattage to be incandescent would not be part of this
9 package.

10 MR. HODGSON: I'm not too worried about those.

11 MR. SHIRAKH: Yeah, I don't the range hood
12 lighting was every included in that.

13 MR. FLAMM: Right. This is Gary Flamm, I wanted
14 to clarify that currently the range hood lighting is
15 exempt from the standards.

16 MR. HODGSON: Okay. All right, so I -- it's
17 doable. So, is it a graduated credit or are we just
18 looking at five percent?

19 MR. SAXTON: I don't think we know yet.

20 MR. HODGSON: To be determined.

21 MR. SAXTON: Yeah, to be determined.

22 MR. HODGSON: Okay. Love to give you feedback
23 on that and would like to include some plug load
24 incentives because to me that's -- to us, I think that
25 is a big issue.

1 MR. SAXTON: Okay.

2 MR. HODGSON: So, maybe we could look at the
3 case study and see if there is something that's
4 practical and enforceable because I share your concerns
5 about enforceability.

6 MR. SAXTON: Okay.

7 MR. HODGSON: But plug load issue is a big one.

8 MS. BROOK: Is there any builder experience with
9 plug load controls?

10 MR. HODGSON: There are a couple production
11 builders right now that are coming out with, and I'm
12 going to call it loosely, a green plug system. And it
13 has an ability to turn off a certain series of plugs
14 that are identified in the house that you would be
15 using, or your children would be using for appliances.
16 You know, it's not your refrigerator, but maybe your
17 Game Boy, or it's your TV or that kind of stuff, and
18 they're exploring those.

19 So, I think giving them an incentive to look at
20 that, it usually -- it requires dual wiring, you know,
21 multiple wire circuits, but may be something that, you
22 know, I think we'd want to encourage.

23 MS. BROOK: Uh-hum, uh-hum, okay, thanks.

24 MR. SHIRAKH: Thank you, Mike.

25 Mr. Keesee?

1 MR. KEESEE: Mike Keesee, from SMUD; a couple
2 observations and the like. If you're looking at the
3 appliances, the two biggest ones that you need to look
4 at are the clothes dryer and the electric range because
5 those have huge peak implications.

6 MS. BROOK: Right, out of our control here.

7 MR. KEESEE: Every builder puts in a range, that
8 I've noticed, or an oven of some sort, and they usually
9 put in the 220 plug.

10 MR. SAXTON: I'm not sure what you're
11 suggesting, Mike, that we would encourage gas appliances
12 in those instances or --

13 MR. KEESEE: Well, you need to be aware of it.
14 The real gorilla in the room, in my opinion, is the
15 induction cook tops because even though they will cook
16 food faster, they boil water faster for example, they
17 have the same KW draw as typical resistance, at least
18 from what I've seen.

19 MS. BROOK: Uh-hum.

20 MR. KEESEE: And that has real implications for
21 zero energy going forward and it has real implications
22 for the utilities in general because I'm not going to
23 ask anybody to not cook between my peak period, in
24 general.

25 So, it's -- I don't -- you know, it's a tough

1 one. I'm just saying it's something to be aware of.

2 MS. BROOK: Uh-hum.

3 MR. KEESEE: It's tough because on the other
4 hand you might have AB 32 come down and say no more gas,
5 right, and gas is more expensive and that's why the
6 builders put in the 220 plug.

7 There may be some tradeoffs there, you know,
8 there's been speculation that we've talked about
9 internally about, well, we might give that plug away for
10 the EV in return.

11 So, I'm just saying -- and it's the same with
12 the dryer, the dryer is another -- again, the 220
13 typically goes in because it's a cheap -- it's a cheaper
14 dryer for cost-wise.

15 In fact I was surprised in one of the projects I
16 did, Premier Gardens, I think you guys helped us, there
17 were easily half the people there had electric dryers.
18 Again, you know, those are easier to control. I think
19 it would be easier for utilities to come up with a
20 demand response program that would reward customers not
21 to use their dryer during the peak period because, well,
22 you know --

23 MS. BROOK: Dry your socks at night, wasn't that
24 a --

25 MR. KEESEE: Yeah, exactly. You know, people --

1 I think people would respond to that. We give them that
2 message already. But I'm not going to tell them not to
3 cook between 4:00 and 7:00, particularly with kids.

4 So, I'm just telling you these are -- you know,
5 there's things I'm grappling with, with my program and
6 just in general.

7 The idea of doing something with the plug loads
8 needs to be done. I don't have an answer there, either.
9 The green plug or green switch is a good idea, there are
10 wireless ones out there, too. They're not necessarily
11 inexpensive and the thought there is maybe you need to
12 talk to the PUC, or whoever's running the demand side,
13 the demand response programs that there might be some
14 link there, that might be the way to do it. You know,
15 and I know that's sort of out of the builder's hands
16 because it's the homeowner that needs to make the
17 agreement with the utility on a demand response basis.

18 But we did -- we've done things at SMUD, like
19 our air conditioning load management program, that was a
20 required part of our service that you had to install the
21 ACLM switch.

22 And in fact people were automatically enrolled
23 for some point, for some time under that program at
24 SMUD. We've discontinued that at this point, but it may
25 be worth discussing in the world of smart grid, and

1 smart meters, and so on and so forth.

2 I mean that is, I think, the implicit thought
3 about what's going down with smart meter.

4 The last thing I would just mention here is that
5 I have to discuss this internally, with our folks, but I
6 think we would support a requirement that all the
7 lighting be a high-efficacy, period, going forward.

8 It's the easiest payback, there's lots of stuff going on
9 with lighting, it's not as expensive as it used to be.

10 I think with the advent of the LEDs, in
11 particular, in the next couple of years --

12 MR. SHIRAKH: Are you talking about the BAY
13 standard or --

14 MR. KEESEE: I would make it just a mandatory
15 requirement.

16 MR. SHIRAKH: We talked about this at great
17 length with stakeholders and --

18 MR. KEESEE: Yeah, I would make -- I would make
19 high efficacy -- I think we would be in support of that.
20 I need to go back and talk internally. But I think my
21 program experience is that high-efficacy lighting's
22 there right now, there's no need not to do it.

23 And so there you go.

24 MR. SHIRAKH: Thank you.

25 MR. WILCOX: Mike, I have a question. The

1 internal gain calculation stuff that we're using in the
2 residential programs now is based on the HERS stuff, and
3 it actually has a whole system that does electric stoves
4 versus gas stoves, and electric dryers versus gas
5 dryers, et cetera.

6 And my question is are you suggesting that that
7 should be a variable in the process here and that you
8 would support --

9 MR. KEESEE: Well, what I'm suggesting --

10 MR. WILCOX: -- encouraging gas appliances?

11 MR. KEESEE: Well, the standards and the
12 programs already do in many respects.

13 MR. WILCOX: Yeah.

14 MR. KEESEE: I mean -- what I'm suggesting here
15 is that those two appliances represent significant peak
16 demand --

17 MR. WILCOX: Absolutely.

18 MR. KEESEE: -- on a utility system. You know,
19 if someone were to turn on all the burners on their
20 electric stove at once, you know, you're looking at 10
21 KW of instantaneous demand or something going on.
22 Heaven forbid they turn on the stove, too, during that
23 peak time.

24 I don't know who would cook that way, but I'm
25 sure it's been done. And they could have their dryer

1 going at the same time, for whatever reason; right? And
2 a dryer has significant demand requirements, you know,
3 an electric dryer.

4 So, if you're driving everything at TDB, which
5 in my mind is peak demand, if we're going to get to zero
6 energy, you know, I make -- I make the comments that we
7 could do Japanese houses, which include all electric,
8 except they don't eat at home. They eat out and they do
9 everything off-peak because they're often on time-of-use
10 rates that impact them, and I don't think their laundry
11 loads is the same as Americans, as well.

12 So, I'm just saying it's tricky.

13 MR. SHIRAKH: Well, what if we had a requirement
14 that they would need to provide a gas hookup and not
15 electric, would that --

16 MR. KEESEE: Well, certainly, I'm just saying
17 then you might run into AB 32 issues at some point going
18 down the -- down the road.

19 MR. SHIRAKH: I mean as a credit, that's what I
20 mean.

21 MR. KEESEE: Yeah, I mean that might be one way
22 to look at it.

23 MR. SHIRAKH: Get a credit, that's what I mean.

24 MR. KEESEE: Could be. The problem is that, you
25 know, the homeowner still makes the decision on what

1 appliance to purchase. And we were surprised, at least
2 in that one instance, at the high incidence of electric
3 dryers and I think it's just because it's a cheaper --
4 cheaper appliance and easier to hook up.

5 MR. SHIRAKH: Mike?

6 MR. GABEL: Mike Gabel, Gabel Associates.

7 So, this proposal would potentially be
8 combined -- could be combined with the other one, under
9 the same permit, right, you could do both?

10 MR. SHIRAKH: The other one, you mean the PV?

11 MR. GABEL: The solar PV credit.

12 MR. SHIRAKH: Yeah.

13 MR. GABEL: So, again, it's implementation with
14 the ACM manual of figuring out not just independently
15 how each of these is going to work, then when someone
16 actually wants to put them together, like what really
17 happens under the hood in the ACM in figuring that all
18 out, you know, it's one more thing.

19 MR. SAXTON: Definitely something to figure out
20 and the potential affect on the overall budget.

21 MR. SHIRAKH: Any other questions or comments on
22 appliances, lighting? Anything online?

23 So, we're actually ahead of our schedule. I
24 just want to warn everyone that we may be done before
25 lunch, if we go at this pace. So, those who are

1 interested in the REACH standard topics, you know, you
2 should stay tuned for the rest of this in case we get
3 through the rest of the agenda.

4 So, the next topic is going to be the
5 refrigerant charge and verification, and John Proctor is
6 going to present that topic.

7 MR. PROCTOR: So, this is CEC staff proposal
8 with modifications possible, originally sponsored by the
9 case -- a case study. The study author is Bruce,
10 myself, and Rick Chitwood.

11 This is the charge verification situation today.
12 In the field there's a standard procedure that can be
13 used above 55, as long as the indoor temperature is
14 below 70.

15 There's a standard procedure, the same procedure
16 can be used above 65 without restrictions on the indoor
17 temperature.

18 There's a weigh-in method that can be used up to
19 55.

20 And how the air flow is determined to be correct
21 is, in my opinion, not perfectly clear in the standards,
22 even though I wrote part of it.

23 You can also put in a charge indicator display.
24 The downside of the charge indicator display is you
25 can't find one for sale.

1 Right now Trane and American Standard have a
2 machine out that doesn't use super heat or subcooling as
3 its charge verification procedure and, therefore,
4 there's -- that equating no way to install this machine
5 in California.

6 And potentially, as different things come up,
7 there are other machines that may have other methods of
8 determining correct refrigerant charge that we currently
9 don't handle.

10 Also today the air flow through the unit for the
11 charge measurement can be measured by -- can be actually
12 directly measured by three different methods.

13 Can you hear me okay?

14 MR. SHIRAKH: No, your mic's off.

15 MR. PROCTOR: Whoa. Okay, now I'm going to have
16 to calm down a little bit here.

17 Let's see, so today the air flow can be verified
18 by multiple direct measurement methods and also by the
19 temperature split method.

20 The temperature split method is controversial.
21 The results are variable, it varies with the -- with the
22 pieces of equipment you're using, with how you measure
23 the temperatures, with the indoor and outdoor
24 conditions. And there are a variety of suggestions out
25 there on how to make it better.

1 And, basically, I'll show you on the next slide
2 that, luckily, we probably don't have to worry about
3 this because we're also -- it's becoming mandatory in
4 this new standard that the unit has 350 CFM per ton
5 through the unit already and, therefore, you don't have
6 to measure airflow by some other method because you're
7 already going to have to measure it by a direct
8 measurement system or have an upgraded return system.

9 So, this is the -- basically, the proposal, to
10 extend the use of the standard method for thermostatic
11 expansion valves to a lower temperature, where the
12 manufacturer agrees with that.

13 Secondly, to add a procedure that can be done
14 down to 40 degrees where you -- where you restrict the
15 amount of air leaving the condenser and, again, that's
16 with the manufacturer's approval.

17 Clarify that weigh-in is acceptable. It's
18 interesting, the changes I made in these slides aren't
19 here but, okay.

20 The weigh-in method is acceptable basically at
21 all temperatures. And the change that was in this
22 slide, that doesn't show up here, is that it's available
23 above 115, but I suspect it won't get used very often up
24 there.

25 The charge indicator display, that the other

1 change I made in this slide is that the below 55, if you
2 want to use a charge indicator display and have it
3 verified by a HERS rater when the temperature is below
4 55, then it has to have a start-up self-diagnosis
5 included in it to show that it's operational without the
6 machine having to go on. So, there's a split at 55
7 degrees there.

8 The Trane and -- the Trane and American Standard
9 Liquid Line procedure is specified for I believe 65 and
10 above, and we're suggesting not only that that be
11 approved, but it's something that they actually need
12 right now because they, hypothetically, can't sell their
13 machines.

14 And the last one is a methodology to approve
15 other charge verification methods as manufacturers come
16 up with different equipment that needs to be checked in
17 different ways.

18 So, it's -- again, this is a slide that changed,
19 supposedly. And, basically, since airflow is already
20 determined adequate based on the mandatory 350 CFM per
21 ton then the temperature split method is no longer
22 needed. It gets rid of the variability and uncertainty
23 associated with the temperature split method.

24 There are for options available, the
25 prescriptive return duct system, which doesn't require a

1 HERS rater, and then the other existing, the three
2 currently existing systems, flow grid, pressure
3 matching, and flow hood.

4 This is some details on what you saw in the
5 graph, the second graph or the second table that showed
6 where we're expanding, the standard procedure and, also,
7 providing alternative methods in order to cover a
8 higher -- a larger number of possibilities.

9 Let's see. So, yeah, expanded use of existing
10 methods and instead of weigh-in method up to 115 you can
11 use it up to a hundred and -- or 365, I suppose, if
12 you'd like, if it happens to be that hot out. I guess
13 that would be serious global warming, wouldn't it?

14 The HERS verification, we would be widening the
15 acceptability range for the HERS rater. Right now,
16 because conditions change and instrumentation is, you
17 know, not perfect you don't want to have a situation
18 where the contractor goes out and does the job right,
19 and the HERS rater comes out and says that it's wrong
20 when it actually is right.

21 And so this widens the variance allowed by the
22 HERS rater on super heat from six degrees to eight
23 degrees, and on the subcooling from four degrees to six
24 degrees, with the proviso that the subcooling is always
25 greater than two degrees Fahrenheit.

1 Instrumentation issues; right now the sensor
2 response is how the temperature sensors respond to
3 changes in temperature. When you, say, start with them
4 at, say, a hundred and -- 110 degrees, maybe, sitting
5 out in the sun and you put it on a suction line that's
6 running at 55 degrees how long does it take for it to
7 respond to that and give you the right temperature?

8 That is actually changed from 15 seconds to 90
9 seconds because right now, sort of best case, there are
10 very few temperature sensors that will respond that
11 fast.

12 Pipe temperature sensors; there have been a lot
13 of testing done on those. There's a new test for
14 compliance that actually the pipe temperature sensors
15 are tested on a series of different pipe sizes and are
16 certified for the pipe sizes that they work on and not
17 certified for the ones that they don't work on.

18 In the current standard we have hole sizes -- we
19 have two holes in exactly the same place that are
20 different sizes, so we figured maybe we'd fix that.

21 The saturation temperature measurement sensors
22 are eliminated and there's a -- also a proposal to make
23 an option of a pressure -- a saturation pressure
24 measurement sensor to be permanently installed on the
25 unit.

1 And specifying digital refrigerant pressure
2 gauges because the field data shows that the analog
3 gauges are very, very, very often wrong, they're out of
4 calibration.

5 And if you want to use a refrigerant charge
6 indicator display at lower temperatures, then you have
7 to have self-diagnosis on the machine, on the charge
8 indicator display machine.

9 And I actually said that in another slide, and
10 that's it.

11 MR. SHIRAKH: I actually have a question, John.
12 Would the CIDs work on the micro channels, the Trane and
13 the American Standards?

14 MR. PROCTOR: They would work. The CIDs would
15 work on any machine that uses either super heat or
16 subcooling as the method of determining charge. They
17 wouldn't work at this point on a machine that uses the
18 Trane and American Standard micro channel methodology.

19 MR. SHIRAKH: So we need to clarify that.

20 MR. PROCTOR: Yeah.

21 MR. SHIRAKH: I understand that. My second
22 question, is there anybody out there who's thinking
23 about making a CID that would be available in time for
24 the standards?

25 MR. PROCTOR: Yes, hypothetically, as it has

1 been for a couple of years. Supposedly, it's going to
2 be at the big HVAC show in January.

3 MR. SHIRAKH: Good. Any questions? Anything
4 online? We can have breakfast.

5 Okay, so we're going to move to the next topic,
6 which is residential field verification and diagnostic
7 testing for mechanical ventilation.

8 MR. WILCOX: Okay.

9 MR. SHIRAKH: Is John McHugh going to be here,
10 do you know, before lunch? All right, thanks.

11 MR. WILCOX: Okay, so I'm going to talk about
12 this topic, which is kind of actually talking about the
13 references in the standards to the ASHRAE 62.2 indoor
14 air quality ventilation requirements, and also to field
15 verification and testing for those requirements, and
16 also to some details related to filters and so forth
17 that are related to the ASHRAE 62.2 standard as well.

18 So, the three things I want to talk about here
19 are the -- we're proposing to update the reference in
20 building standards to ASHRAE Standard 62.2. We're going
21 to add some new requirements for HVAC system airflow and
22 filter labels.

23 We've discussed this previously but it relates,
24 actually, to some of the new requirements that are in
25 62.2 as well, so I wanted to talk about them again in

1 that context.

2 And then we're proposing to add a requirement
3 for field verification and diagnostic testing of the
4 airflow for indoor air quality ventilation systems and
5 for HVAC filter labeling.

6 So, the current, 2008 standards reference
7 ASHRAE, ANSI ASHRAE Standard 62.2 2007, and so we've
8 proposed to update that reference to the 2010 version of
9 62.2.

10 And I guess there's some outside chance that we
11 might be able to update it to the 2013 version, but I'm
12 still not clear whether that will be ready in time to be
13 adopted when the standards are adopted, and I'm trying
14 to check on the details of that.

15 So, the idea here would be to update to the
16 latest version of Standard 62.2 as part of this
17 standards update.

18 If we do the 2010 version of the ASHRAE
19 standard, we will propose to also reference at least two
20 addenda that have been adopted since that standard was
21 published. Those are ASHRAE 62.2 addenda B and E, and
22 I'll talk about those in a second.

23 Addenda B -- both these relate to filters and
24 the filtration requirements that are in that standard.

25 Addenda B adds a second rating standard that's

1 allowed to be used. The current standard requires a
2 MIRV 6 rating, which is using an ASHRAE rating
3 procedure, so the Addenda B expands that to include
4 ratings using the AHRI Standard 680.

5 So, this is intended to allow more comprehensive
6 use of filter test standards, including this more modern
7 AHRI Standard.

8 So, just basically expands the available filters
9 that can meet the standard.

10 And then the -- and then the E has to do with
11 pressure drops. We've gone round and round about the
12 pressure drop requirements in the 2007 standard and the
13 requirement that you designed to meet that and all the
14 problems that ensued from that.

15 So, the Addenda E is designed to change and
16 improve that situation and it basically says that you
17 have to design the system to accommodate the pressure
18 drop as rated using the HRI standard which, in addition
19 to a filter efficiency, gives you an airflow rating
20 versus pressure.

21 So, it's finally bringing in the information
22 that was missing out of the previous standard where it
23 was -- it's been argued by knowledgeable people that it
24 was impossible to meet the standard given the
25 information that was available.

1 This standard also -- this Addenda also requires
2 that the filter locations be labeled with the design
3 airflow and maximum allowable clean filter pressure
4 drop, and that that should be visible to the person
5 replacing the filter.

6 And this is basically very similar to the
7 proposal that we discussed when we presented the airflow
8 and fan watt drop topic to have labels on filter grills
9 that help people understand what kind of filters should
10 be put in for those -- for those systems.

11 So, this is all consistent, we're all moving the
12 same direction here, I think, to try and get a system
13 that works better and is better maintained over the life
14 of the system so that we can maintain airflow and filter
15 efficiency.

16 So, the proposal for the California standards
17 that's related to this is basically along the lines that
18 the contractor shall label filter grills with required
19 airflow and pressure drop information. The details of
20 what that label would look like and exactly what it
21 would say is yet to be determined, but that's something
22 that's going to be worked on in the development of the
23 language.

24 Then that the contractor installs filters
25 labeled by the manufacturer for efficiency and airflow.

1 Remember, we discussed this one, also, at the airflow
2 and watts workshop and in the context that the building
3 standards don't really have any ability to regulate
4 filters sold in the open market. We're not doing
5 appliance standard here, we're only doing a building
6 standard.

7 But what the building standard I think can do is
8 insure that the initial filters that are installed by
9 the contractor meet the requirements in the standard and
10 then that, potentially, will be an incentive for people
11 to provide label filters in the general market.

12 So, this requirement would say that a contractor
13 has to installed filters that are labeled.

14 Point three here says that the filters that are
15 installed has to be consistent with the required airflow
16 and filter grill labels, so the whole system has to be
17 done right, and that there be a HERS rater verification
18 of this filter labeling and the filter installation at
19 the time that a new house is finaled.

20 So, that's the proposal is that we'd include --
21 we'd make this whole system work, you have to have
22 labeled filters, you have to have labeled grills, you
23 have to put in the filters that match the labels and
24 it's going to be a compliance variable that's going to
25 be verified.

1 Okay, so the other new test and verification
2 requirement that we're proposing here is to -- has to do
3 with the airflow that's actually delivered by the indoor
4 air quality ventilation system.

5 We're requiring continuous mechanical
6 ventilation or, basically, to meet Standard 62.2 and
7 that -- you know, those CFMs are calculated by the ACMS,
8 and so forth.

9 The new thing here is to have that -- have a
10 post-construction test by the contractor, which is so
11 the contractor puts the system in, he verifies that it
12 works right by measuring the airflow. Then a HERS rater
13 verifies that the contractor did that measurement
14 correctly.

15 And the proposal here is that that would be done
16 with the normal sampling rules and so forth and, again,
17 the detailed procedure and equipment to be determined.

18 So, in the past this was a -- you know, in the
19 2008 standards we did not propose to do HERS
20 verification of indoor air quality ventilation partly
21 because it would have been a first time that it would
22 have been a measure to require a HERS rater at every
23 house, in principle.

24 But now, since we're requiring several mandatory
25 measures that require HERS ratings, the idea here is

1 that this is not going to cause the -- be the measure
2 that requires the HERS rater to come out. And there's
3 considerable thinking that installation quality is an
4 issue with these mechanical ventilation systems and if
5 you don't measure the airflow, you're not likely to get
6 it all the time.

7 And since this is a health and safety issue,
8 this is an important thing to verify.

9 The question marks there, comments by --

10 MR. SHIRAKH: September 10th.

11 MR. WILCOX: September 10th. Okay, that's the
12 presentation. Question?

13 MR. SHIRAKH: Hodgson's closer and then Gabel.

14 MR. HODGSON: Thank you. Mike Hodgson, ConSol,
15 representing CBIA.

16 I like the attempt at trying to resolve the
17 filter label issue. I don't think it solves the
18 problem. I mean I'm not sure what the restriction is in
19 the State of California on not requiring filters to be
20 labeled in the State, but that's what we need.

21 MR. WILCOX: It's the context, Mike, we just
22 can't do that and it's part of the building standard.

23 MR. HODGSON: Okay.

24 MR. WILCOX: Okay.

25 MR. HODGSON: Well, until you do it what you're

1 going to do is say the filter has to be labeled.

2 So then the rater goes out in the field, filters
3 aren't labeled right now and we all know that, and
4 they're going to look and go, hum, the filter's not
5 labeled, what do I do? Fail the house?

6 MR. WILCOX: Yeah.

7 MR. HODGSON: Well, that's not going to happen.
8 So, I mean it isn't. So, the reality is that you got to
9 label the filter. So, until you can label the filter
10 and then you can check something against it, and John
11 brought up -- John Proctor got up a very good point as
12 to why does it have to be a HERS rater. A building
13 inspector can do this, it's a visual thing. It's the
14 same thing as an IC can for a light, just look and move
15 on.

16 But until you can label the filter you're not
17 solving the problem, you're just making another problem
18 in my personal opinion. I think it's a good attempt,
19 but it's not hitting the mark.

20 The augmentation of the ASHRAE Standard 680,
21 which seems to be the -- really, what's gaining the
22 momentum in the world of filters, is a really good idea
23 and I presume that will carry through through the rest
24 of the standards so that we're not referencing a MIRV 6,
25 or it's a MIRV 6, or I'm not sure how that's going to go

1 through.

2 MR. WILCOX: Well, what the ASHRAE -- what 62.2
3 does is it provides an alternate rating that's
4 consistent, supposedly, I mean it's argued the -- the
5 argument is that they give you the AHRI terms that will
6 give you the same filter efficiency as a MIRV 6.

7 MR. HODGSON: Yeah, but I think in the Title 24
8 it specifically says MIRV. And I just want to make sure
9 where it says MIRV 6 in Title 24 that you follow through
10 and make sure that this alternate is also listed.

11 Because we also will get stopped at the Building
12 Department if we have an AHRI compatible filter that
13 doesn't say MIRV 6, and it says in the code MIRV 6, then
14 we're wrong and we need to fix it.

15 MR. WILCOX: Okay.

16 MR. HODGSON: So, still like to work on the
17 label problem because it's a problem. This doesn't --
18 good idea, but we're going to get stopped in the field
19 because of it.

20 So, until we can label filters, until we can
21 figure out how to mandate filters to be labeled so that
22 we can see what they are, we're stuck.

23 MS. BROOK: So, the thing --

24 MR. HODGSON: Tell us how to do that?

25 MS. BROOK: Well, we can be proactive. I mean

1 we're not -- we're not the Title 20 appliance staff, so
2 we can't open a rulemaking and force filters to be
3 labeled. But we can work with those staff to let them
4 know that it's important.

5 The other thing we can do is be proactive in
6 letting -- because we do have connections with this AHRI
7 group of -- and the ASHRAE Subcommittee of Filter
8 Manufacturers, that we could basically let them know
9 that this is a requirement.

10 And we can also do the thing that we talked
11 about, where we know all these filters do provide labels
12 and get that information published on a Commission
13 database, or website, and those kind of things.

14 MR. HODGSON: Well, have you recently looked --
15 I have not recently looked at the filter website, at the
16 Commission, but last time I looked there were very few
17 filters listed.

18 MS. BROOK: Right.

19 MR. HODGSON: And that's been, I think, the same
20 thing for the last three years since we brought -- you
21 know, we started the issue with the 2008 standards.

22 MS. BROOK: Right, right.

23 MR. HODGSON: And working with that committee,
24 and I'm sure it's a great committee, but I still don't
25 see a change in the market.

1 You go to the Homes or Lowe's, Depot, or the
2 Slakey Brothers, and we have the same filters out there
3 that we've had for the last five years.

4 MS. BROOK: Uh-hum.

5 MR. HODGSON: Now, they're getting better in
6 quality because we are addressing the MIRV 6 issue, but
7 it's really difficult to find the labels on them.

8 MS. BROOK: Gary?

9 MR. FLAMM: Gary Flamm, Energy Commission.
10 There is a Title 20 Scoping Workshop on the 31st of this
11 month and I think that would be a great topic for a
12 number of stakeholders to bring up. And if this is
13 basically a nonissue it really could, you know, sail
14 through that process.

15 MR. HODGSON: We would stand right behind the
16 Commission staff proposing that.

17 MS. BROOK: All right, we'll be there.

18 MR. HODGSON: Okay. Remind us and we'll be
19 there, too. Seriously.

20 MS. BROOK: Okay.

21 MR. HODGSON: The other issue is measuring
22 airflow of 622 fans. Great idea, should be done. The
23 problem is not a lot of equipment out there that can do
24 it accurately.

25 So, the flow hoods we use currently for

1 mechanical systems are not the right piece of equipment
2 we have to use for this, and the HERS raters don't know
3 that. I mean, they may --

4 MR. WILCOX: Well, as I said we're going to
5 develop the rules for equipment and procedures for that.

6 MR. HODGSON: Okay.

7 MR. WILCOX: And that's definitely an issue.
8 There is some special build equipment that I think works
9 fine for exhaust systems, that's relatively inexpensive
10 and easy to do. It's a little more difficult for some
11 of the other stuff.

12 MR. HODGSON: Yeah. We've been measuring
13 kitchen fan flows, ventilation flows for about a dozen
14 years.

15 MR. WILCOX: Yeah.

16 MR. HODGSON: And you have to use a different
17 piece of equipment and it's -- you know, for a rater
18 it's another couple -- you know, a thousand dollars, or
19 whatever, to carry this piece of equipment with them.
20 But --

21 MR. WILCOX: There's a new set of equipment
22 that's starting to come out, that's in basically
23 prototype testing, now, that's powered flow hoods that
24 are -- can measure accurately down to the levels you
25 need.

1 MR. HODGSON: Okay.

2 MR. WILCOX: That will be on the market very
3 soon. And it's kind of a -- for anybody that has a duct
4 blaster, it's the same -- it's basically an add-on to a
5 duct blaster, so it's not expensive.

6 MR. HODGSON: Well, I'd like to learn more about
7 it. But that's -- it's a good idea we support it, but
8 it's the -- the use of that type of measurement device
9 is not widely held or done correctly.

10 MR. WILCOX: Right, yeah.

11 MR. HODGSON: I mean because I've seen them done
12 with a flow hood and, boy, plus or minus a hundred CFM
13 doesn't make a big difference there so --

14 MR. WILCOX: Yeah.

15 MR. GABEL: Mike Gabel, Gabel Associates. So,
16 is combustion safety testing an integral part of this or
17 is it kind of an adjunct, or what's not officially part
18 of this test?

19 MR. WILCOX: When I wrote that I wasn't thinking
20 about combustion safety testing.

21 MR. GABEL: Okay.

22 MR. WILCOX: But if there's a large clamor from
23 those in the know who want to do that, I suppose it
24 could be expanded.

25 MR. GABEL: Yeah, there's some local governments

1 that might be interested in that and I can talk to you
2 offline about that.

3 MR. WILCOX: Well, Standard 62.2 has procedures
4 for that.

5 MR. GABEL: Right.

6 MR. WILCOX: They're pretty simplified and
7 but -- because I don't -- I don't know that that's a big
8 issue. I'm just worried about getting the ADCFN that
9 you're supposed to get and that's what this is aimed at
10 for ventilation.

11 MR. GABEL: Okay, I can talk to you offline
12 about that a little bit so --

13 MR. HODGSON: General information question for
14 both Bruce and John. AHRI, I believe, had just come out
15 with a installation standard which addresses combustion
16 safety. Is that something that is worthwhile
17 referencing? I think it was attempted to be referenced
18 in the IECC and it's in the National Green Building
19 Standards as a, you know, minimum standard.

20 And I was wondering, it's not my area of
21 expertise, it's I think more John's, and I'm just
22 wondering if that's a useful -- I'm not saying it's a
23 requirement, but some type of protocol that could be
24 referenced in the residential manual.

25 I'm curious as to whether you guys have reviewed

1 it. I think it was published last January in a fairly
2 extensive consensus process. I can get you the --

3 MR. WILCOX: Yeah, please do. I'm not familiar
4 with it, but we'll check into it.

5 MR. HODGSON: Okay, because it goes into all
6 sorts of -- I mean it's national, so it goes into
7 boilers and stuff that we're not too excited about, but
8 it's an interesting -- I mean I like a consensus
9 document that has quality control in it and that's what
10 it's attempting to do, and I'm just wondering whether
11 you guys have reviewed it. Okay, I'll send it to you.

12 MR. SHIRAKH: Thank you. Any other questions
13 related to indirect quality? Anyone online?

14 Okay, thank you.

15 MS. BROOK: Maybe just remind people that you
16 want comments, not by three question marks, but by
17 September 7th.

18 MR. SHIRAKH: September 10th. And, hopefully,
19 September 10th is not a Sunday, is it? Can somebody
20 check that? It's a Saturday So, let's -- so September
21 10th is a Saturday, let's make it September 12th, which is
22 a Monday.

23 So, this next topic is going to be changes to
24 administrative code sections of the standard, a
25 restructuring of the standards numbering system, the

1 prescriptive packages and the forms.

2 We actually have developed some draft language
3 for these changes, but we're not prepared to actually
4 show the changes because the enforcement unit within the
5 Commission, they haven't had a chance to look at this
6 and we don't have buy-in from them.

7 So, what we're going to present instead is kind
8 of the high level, the ideas that we're considering.
9 And, hopefully, within the next week or so, you know,
10 we'll have the buy-in from folks within the Commission
11 and we can release the language.

12 So, Gary Flamm and myself will probably be doing
13 tag team on this one and Gary will start, and then I'll
14 take over on the later sections of the presentation.
15 Okay.

16 MR. FLAMM: Good morning. So, we're going to go
17 over, as Mazi said, just a high level of what we're
18 proposing to do with the Title 24, Part 1, Section 10
19 Administrative Code changes.

20 There are a number of staff that have been
21 working on this, this is not just one person's effort.
22 And I have the privilege of presenting for all of the
23 staff.

24 So, as Mazi said, the language is not finalized
25 and it has not been approved by management, yet, and it

1 has not -- we do not have a consensus in-house yet, so
2 we're not ready to present that language.

3 So, we're going to present the key changes in
4 each section and we're going to have the -- very soon,
5 hopefully within a week or so we're going to have the
6 language available for public review.

7 The first -- we're going to go through section
8 by section in the Section 10, and so we're going to be
9 adding and modifying definitions. In our proposal to
10 have a alternate calculation reference manual we came up
11 with a definition that's going to be in addition to the
12 approval manual.

13 I'm not going to read these, but these are
14 definitions that are either going to be added or amended
15 in the standards. So, a lot of the -- the changes
16 are -- there's a number of reasons for the changes that
17 are being proposed by staff.

18 There's additional consultant work that we're
19 trying to encompass. There's the -- there's an effort
20 to make -- add more clarity. There's an effort to be
21 consistent with other national efforts.

22 So, Section 10-103 is probably the section that
23 has the most word changes. There's a -- and this is in
24 response to some subcontractor work that is being done.
25 Jeff Miller has been leading a lot of this effort.

1 The effort is to delete obsolete language, to
2 reorganize and revise for improved clarity, to update
3 references to the document registration requirements, to
4 require document registration for nonresidential
5 compliance documents, to introduce an option for
6 document repository approved by the Executive Director,
7 and a proposal to simplify certificate of compliance for
8 some alternations.

9 MR. SHIRAKH: So, this last bullet that Gary
10 mentioned, this came at the request of Tom Garcia and
11 CALBO. It's basically this would be for residential
12 alteration and some additions that do not involve a HERS
13 verification feature.

14 In additions that are less than a thousand
15 square feet basically we're allowing the building
16 departments to come up with simplified forms, it could
17 be just a check box. And we're leaving it up to them
18 how they want to enforce it.

19 Again, this would be non-HERS verified measures.

20 MR. FLAMM: So, in Sections 10-104 and 10-105
21 there are no changes being proposed.

22 In 10-106, this has to do with compliance
23 options. The Energy Commission does have a document, a
24 compliance option manual that staff is also updating.
25 And in updating that manual we found that there's some

1 clarity that needs to be added to Section 10-106. So,
2 there's going to be some clarity added to this section
3 for locally adopted standards and help alleviate some of
4 the confusion about application requirements to the
5 Commission.

6 Section 10-107, this -- Mazi, you added this, I
7 believe. You want to --

8 MR. SHIRAKH: Yeah, this basically -- I mean
9 this is not a new idea, but we're clarifying it. It
10 gives the Executive Director the authority to approve a
11 new protocol or a procedure which is equivalent to
12 existing requirements.

13 And that we -- examples are that, you know, this
14 morning we talked about refrigerant charge verification,
15 but there are equipment out there that -- like the micro
16 channels, for which we don't have existing protocols.
17 So this would allow us to actually approve something
18 without going through a formal rulemaking.

19 We have been doing this in the past, but this
20 just codifies it, clarifies it.

21 Another example was, you know, the winter setup,
22 you know, for the refrigerant charge where, you know, we
23 don't have a procedure. You know, we came up with
24 something, although it didn't work, we went through the
25 procedure, talked with the stakeholders and if we had

1 consensus, we could have approved it. So, this is the
2 idea here is to basically allow us to come up with
3 something that's equivalent, not a new requirement.

4 MR. FLAMM: No changes proposed for 10-108.

5 Section 10-109 to include requirements for the
6 application submittal and some clarifications to approve
7 procedures for compliance software, alternative
8 compliance packages and exceptional methods.

9 No changes proposed for 10-110.

10 Section 10-111 some new language for
11 certification labeling of fenestration to include VT,
12 visible transmittance.

13 No changes proposed for 10-112.

14 10-113, strengthening the language for reporting
15 of roofing performance properties to the Energy
16 Commission by the certification entity.

17 10-114, there are two requirements in 10-114.

18 One is for the amendment -- the amending of outdoor
19 lighting zones and the other is for local ordinances.
20 Basically, that means authorities having jurisdiction
21 that have minimum outdoor lighting levels.

22 That requirement for local ordinances is being
23 removed because the similar language is being removed
24 from Section 147.

25 So, back in 2005 when we first adopted the

1 outdoor lighting standards there were a number of
2 concerns that the proposed -- the brand-new outdoor
3 lighting standards would not be able to meet the local
4 requirements for minimum foot candle levels.

5 And so an additional layer was offered as, okay,
6 if you have a local ordinance, you can have this extra
7 wattage.

8 And in 2008 we required local ordinances to
9 certify that to the Energy Commission and nobody has
10 certified it to the Energy Commission and so, therefore,
11 we can only conclude that the extra layer is not needed.
12 And, you know, my opinion is that the -- all of the
13 allowances already will allow you to meet local
14 ordinances. So, it was really, basically, a cherry on
15 top of all of the outdoor lighting levels that you
16 already get. So that's all being removed and it's been
17 determined that that additional layer is not needed.

18 I'm going to let Mazi take this one.

19 MR. SHIRAKH: So, this is the restructuring of
20 the subsections numbers. The problem we have here is
21 there's a few places where we have actually ran out of
22 numbers, Sections 10-10 -- 110 to 119 and 140 through
23 149. And so there's no room to add more sections.

24 And there is a proposal to have a mandatory
25 requirement for nonresidential buildings and we don't

1 have a place to put them in the 140s. So, the idea is
2 to use decimal numbering system in place of whole
3 numbers in the main sections, but all the other
4 conventions for letters, Roman numerals and other
5 numbers would remain the same.

6 We've tried to do it in a way that kind of
7 preserves some familiarity with existing numbering
8 system, and this is not set in concrete, you know, we're
9 open to other suggestions.

10 But here's an example where like Section 140
11 becomes 140.0, 141 becomes 140.1, and 142 becomes 140.2.
12 So there is some familiarity, you know, those who know
13 lighting is 146, indoor lighting/outdoor lighting is
14 147, there is some familiarity in there.

15 And so we will follow the same convention for
16 other subchapters, like the residential become 150.0,
17 150.1, 150.2 and there's really no limit how many
18 sections we can add to it.

19 So, examples would be the Section 150(k)1
20 becomes 150.0(k)1. And 146(a)(1)(a) becomes
21 140.6(a)(1)(a). So, it should look familiar to people
22 and I think it accomplishes what we're trying to do.

23 It's going to be a challenge to manage this
24 through the compliance manuals and all of that. I don't
25 think we have a choice.

1 The prescriptive packages, I think this has
2 already been presented throughout these workshops and
3 proceedings. The current -- the main package is called
4 package D, there are no package A and B no more.

5 And both the CEC and the team are thinking
6 about -- and I think the builders are very interested in
7 having these alternative prescriptive packages. So, we
8 thought it made sense to start fresh and not go from D
9 to whatever. So, we're basically starting with package
10 A and going to B, C, D and so forth. And I think
11 everybody is on board with this.

12 The forms are not part of the standards, these
13 are part of the compliance manuals, you know, it's not
14 something we're going to do here. But since we're
15 making changes to everything else we felt, you know, the
16 numbering system for the forms appears like it was the
17 result of a random number generator. We're going from
18 CF-1R to CF-6R and back to 4R.

19 The simplest thing would be to actually make
20 them sequential, CF-1R, 2R and 3R. There's also a
21 suggestion to actually simplify the names, so that's
22 just something we're putting out there on the radar.

23 And that's basically it. Any questions on --

24 Pardon me? Drafts for 10-103, we have -- I
25 would say probably in two weeks.

1 Mike Gable?

2 MR. GABEL: Mike Gabel. So, there's one issue
3 I'd like to maybe talk about at some point with staff.
4 I've raised it in a letter, which is putting in the
5 standards the fact that a permit applicant, at the
6 request of the enforcement agency, would have to submit
7 the ACM Input file, electronic file for enforcement
8 purposes.

9 I think it's really important that the
10 Commission set the precedent and the standards that
11 someone doing plan review, officially, has access to
12 those files, everything that they need including the
13 drawings, including everything to do a full review and
14 enforcement of the standards.

15 I think it's really important. Besides
16 documentation, you guys are focusing on registry and
17 documentation, which is good, but this other piece of
18 the puzzle is really important so I'd like to see it get
19 into the standards, somehow.

20 MS. BROOK: So, could it be that the plan
21 reviewer just needs access to the registry? Why would
22 it have to be a separate data submittal?

23 MR. GABEL: Well, I'm not aware that the intent
24 was that the registry would hold the ACM Input
25 Electronic files that run the calculations. If that was

1 your intent, then that's okay.

2 MS. BROOK: Okay.

3 MR. GABEL: But I'm really talking about making
4 sure that somebody can get access to the file that was
5 used to do the calculations.

6 MS. BROOK: Okay, good, uh-hum.

7 MR. SHIRAKH: Tom.

8 MR. GARCIA: This is Tom Garcia, representing
9 CALBO, which is the California Building Officials
10 Organization.

11 I just wanted to comment on Section 103 of the
12 change. One of the things that -- the reason that CALBO
13 is requesting this change is to encourage people to get
14 permits. If we put too much paper out there, we
15 discourage permits.

16 And so all we can do to simplify things and make
17 it easy for people to come to the building department
18 and get permits, we're better off.

19 So, my intent in the question is that we
20 actually make the language say that CF forms are not
21 required for a certain exempt thing, so that's the
22 language that I'd like you to consider and I'll help to
23 propose something like that.

24 Rather than saying it's up to the building
25 department, because if every building department makes a

1 different CF, then the contractors are confused from
2 jurisdiction to jurisdiction. So, if we simply say
3 these specific items, since they're very clear in the
4 standards, you can go to the standards and see what's
5 required for a water heater installation, or for room
6 additions less than 1,000 square feet, where you're
7 using prescriptive paperwork, all of the documentation
8 is already in the standards so CF forms are not
9 required.

10 Is that clear or any questions on that? Great,
11 thanks.

12 MR. SHIRAKH: There would be actually no
13 documentation of any kind for --

14 MR. GARCIA: Because the standards already have
15 the documentation within the standard. I mean the
16 documentation is in the standards, so the inspector can
17 go out and turn to a page in the standards and say, gee,
18 this room addition needs this R value, this window,
19 solar heating factor, all of these things are listed.
20 It's a checklist. Why do we need forms?

21 MR. SHIRAKH: Well, this form could actually be
22 just a checkbox, you know, this meets the statute --

23 MR. GABEL: Well, when we issue the permit the
24 inspector's going to inspect it to the standards, the
25 standards are clear and, therefore, we don't need forms.

1 If you have HERS raters' requirements then,
2 obviously, you do need the CF forms. But for many
3 places, many things that we do the standards are clear,
4 already -- and just the fact that we issue a permit and
5 inspect to the standards, we've complied.

6 MR. SHIRAKH: So, you're talking most about the
7 res -- residential forms?

8 MR. GARCIA: Residential, yes.

9 MR. SHIRAKH: Okay.

10 MR. GARCIA: I don't see and maybe we could find
11 places in non-res. I mean wherever we can do this we
12 should be looking at it, and the CALBO Energy Committee
13 will help to do that.

14 MR. FLAMM: Okay, so one of the constraints I
15 believe with the non-res forms is that there has to be
16 an engineer, a license person of record, who is putting
17 their license on the line with a signature. And I don't
18 imagine that that can go away, that requirement.

19 MR. GARCIA: Maybe not, but as I say, I haven't
20 looked that deeply into the non-res. Okay, thanks.

21 MR. SHIRAKH: Okay, thank you Tom. Ken?

22 MR. NITTLER: Ken Nittler with Enercomp. On
23 that issue of additions, a threshold of a thousand
24 square feet sounds very high to me. That's an awful lot
25 of space, sometimes that's more than the size of the

1 existing house, if it's an existing bungalow. So, I'd
2 recommend a threshold much lower than that.

3 The other concern I would have is how this
4 intersects with requirement for documents to get
5 registered at a HERS provider and end up in the
6 registry. You know, basically, we're moving to a world
7 where every single permit needs to have registration
8 because mandatory measures have HERS verification
9 features. And so I don't understand, if you have no
10 documents and there's nothing crossing the counter that
11 describes what compliance methodology was used, what
12 features are includes how -- what do you register?

13 MR. SHIRAKH: The requirement here is that for
14 additions and alterations, and maybe you're right the
15 thousand-foot is too big, but whatever that number is
16 that does not involve the HERS verification feature.

17 So, if there is any kind of HERS verification --
18 and the requirement for registration --

19 MR. NITTLER: But how does that intersect with
20 the registration requirement?

21 MR. SHIRAKH: The registration is only required
22 for buildings or features that require some HERS-
23 verified feature, so I think the two actually intersect.

24 MR. NITTLER: It's pretty hard to picture an
25 addition that doesn't have a HERS verification

1 feature --

2 MR. SHIRAKH: Well, it has to be --

3 MR. NITTLER: -- so then it doesn't -- may not
4 be addressing the simplification desired here.

5 MR. SHIRAKH: Yeah, I mean that's -- if there is
6 any kind of HERS verification requirement, then it has
7 to go through the whole -- so I think Tom's concern was
8 mostly with like water heater change outs, or a window
9 change out, that sort of stuff that's -- you know, that
10 was the primary concern, or maybe a small addition. I
11 agree, a thousand square feet is probably too large for
12 this and we'll have a conversation with Tom about that.

13 Mike?

14 MR. HODGSON: Mike Hodgson, ConSol, representing
15 CBIA.

16 The last slide you showed, Mazi, was on
17 remembering the residential forms. I just want you to
18 not take that lightly since a lot of us, including the
19 HERS registry, which we're not, but have large
20 databases, and we track things by names. And if we're
21 going on existing subdivisions and you change the CF6R
22 to be something else that is awkward.

23 So, before you make a change and I'm not saying
24 you're doing it lightly, just check with the people who
25 have databases that you're trying to manage and oversee

1 and make sure the impact is not insurmountable.

2 MR. SHIRAKH: Yeah, we're well aware of that and
3 we are going to have a conversation with them. And if
4 it turns out to be a big pain, we won't do it.

5 Jon, are you coming for your presentation or do
6 you have a question?

7 MR. MC HUGH: Sorry I was here so late. Jon
8 McHugh, McHugh Energy.

9 A couple of things that you had brought up on
10 these changes, the first one is the VT rating and the
11 NFRC has been aware of this for years. In fact there's
12 been conversations going back to our early PIER project
13 on skylights that NFRC does not allow in their database
14 for VT, and does not allow the rating under NFRC 200 any
15 product that is diffusing or nonplaner. And so, you
16 know, skylights, which are kind of a big portion of the
17 daylighting component of our standards fail on both
18 counts in terms of NRFC.

19 So, I'd recommend that the Commission look at
20 alternative rating procedures. And, you know, there's
21 one, ASTM E-972, but there's a number of different ways
22 of doing that and I think that needs to be considered,
23 otherwise you could end up inadvertently prohibiting all
24 plastic skylights from the State, which probably
25 wouldn't be a good idea.

1 The other thing is this whole idea of forms for
2 retrofits. And, you know, when the forms are created
3 people -- the authors working on that, in general, you
4 know, have this mindset that it's a new building and
5 you've got this voluminous set of forms. And I would
6 think there's some advantage and it would be beneficial
7 for all of these building departments and also would
8 probably address some of the issues that Ken's brought
9 up about, you know, consistent database formats so that
10 we don't have a hodgepodge of information moving
11 forward.

12 And as I remember, I'd done some trainings with
13 building departments and something like, you know, two-
14 thirds of their business is actually alterations. So,
15 this -- you know, the issue about alterations is
16 actually a big deal. There's a lot of paperwork that
17 goes through. And to the level that we can automate
18 this, make it electronic, make it actually, you know,
19 the State can actually support these 500 plus various
20 jurisdictions with a consistent repository and
21 consistent forms, and streamlined forms.

22 So, yeah, for a roof, you know, should there be
23 something, anything more than like a single page for
24 some of these very simple things.

25 But, you know, we have -- like, for instance,

1 there's a lot of alterations that still involve
2 tradeoffs. Hey, I'm just reroofing but, well, okay,
3 what am I doing with the cool roof? You know, am I
4 going to use the insulation tradeoff, et cetera or, you
5 know, various different paths of getting there.

6 And then also, as we look at non-res, you know,
7 the issue of responsible parties who have their
8 licenses.

9 So, all that would imply that potentially we
10 need a second set of forms which actually deal with
11 alterations. Thanks.

12 MR. SHIRAKH: We actually have, from 2008 we
13 have developed different forms for new construction and
14 alteration, we actually have three sets, additions, new
15 construction, and alterations, so we've actually done
16 that. So, you may want to take a look at that.

17 MR. MC HUGH: Thank you.

18 MR. SHIRAKH: In order to simplify we actually
19 added to the volume of the forms, which is kind of an
20 oxymoron but, actually, it did result in simplification
21 because of some of the things you've mentioned.

22 You know, they're just fundamentally different
23 and requires different forms. So, hopefully, this form
24 generator concept that you're working on will actually
25 simplify this further so that the user doesn't even have

1 to know that these forms exist, and that by just
2 answering the questions the generator will spit out the
3 forms.

4 MR. MC HUGH: Thank you.

5 MR. SHIRAKH: Any other questions related --
6 again, for the 10-103 the biggest changes are the ones
7 that Jeff Miller is working on, it has to do with the
8 registries, the repository, the forms, the signature
9 requirements. A lot of work has gone into and then,
10 hopefully, we can release it for public review pretty
11 soon.

12 Just because today is the last workshop doesn't
13 mean we're not going to have public interaction. We're
14 going to have stakeholder meetings, the groups will be
15 meeting, conference calls and all that is still going to
16 go on.

17 Sir? Yeah, could you please come up?

18 MR. WATERS: Thank you. I'm Mark Waters, from
19 Special AC Pacific Coast Trane, and I'm representing
20 Trane today as the Trane guy from Tyler, Texas couldn't
21 make it.

22 So, I want to speak a little bit about the
23 refrigerant charge position and actually ask if anybody
24 has any questions regarding that as well.

25 The bottom line is I think the new process and

1 procedure that Trane and American Standard have
2 developed far exceeds and makes it very, very, very much
3 easier to accomplish what we're all trying to accomplish
4 as far as the HERS raters and getting things done.

5 I'd like to at least see if we can get it passed
6 so that we can run this as, you know, a trial process.
7 And I'm not sure whether John's gone through this with
8 you already, so I don't want to duplicate a bunch of
9 stuff.

10 And I've been doing this for 40 years, myself,
11 and when they came out and said, hey, we got a new
12 process for this and we all kind of looked at it and
13 hum, okay.

14 But as we have looked at the process more
15 carefully, it's a very, very simple process. It's easy
16 for the HERS raters to accomplish while they're on the
17 jobsite. You know, no more looking up and trying to
18 figure out what the subcooling or super heat properties
19 are supposed to be like. And it's a matter of looking
20 at a single charge, and there's two items to look on it,
21 here's your line and it's supposed to be there and it's
22 either temperature or it's pressure, and whichever one
23 it hits first it's done, and it's over with.

24 So, I think if you guys will take a closer look
25 at that, I'm sure you probably have, and some of you

1 know exactly what I'm talking about. I think it's a
2 good thing and a good road to travel down so, hopefully,
3 you'll adopt that as some language so we'll have a new
4 and more efficient way of looking at things actually
5 come to pass, and make it easier for our guys to do
6 their job all the way around.

7 MR. SHIRAKH: So, John, do you have a comment on
8 that?

9 MR. PROCTOR: Yeah, my only comment -- yeah, my
10 only comment is that, yeah, I looked at it. I think
11 we're really happy with it. My only comment is they
12 actually need something to happen right now because they
13 want to sell these things in California and I don't
14 think they want to wait until 2014.

15 MR. WATERS: Yeah, thank you, John, and that's a
16 good point. We are rolling down the road with the new
17 process and we'll be using this process for all of our
18 equipment.

19 We started with this new particular model, which
20 is a -- it's our low-end line of the model, so it's the
21 13 seer type situation, which everybody's talking about
22 and everybody wants to make sure we get at least 13 seer
23 in. We're moving to the 14, which I'm sure probably
24 California's moving to eventually, anyway. So, that
25 will be something that will take place here shortly as

1 well, and I'd love to actually be able to sell these
2 things in the State of California without having to
3 really jump through a lot of hoops.

4 MR. SHIRAKH: Well, thank you.

5 MR. WATERS: Thank you.

6 MR. SHIRAKH: Of course, another thing we're
7 really interested in, in working with manufacturers, is
8 to come up with some procedures for low temperature
9 refrigerant charge, you know, for cold months.

10 MR. WATERS: Yeah, you know, and I'm with you
11 guys on that a hundred percent. I'm not sure where
12 Trane, quite frankly, totally stands on that. I know
13 that there was a little bit of a controversy there at
14 one point but I'll tell you, I'm pushing that. I come
15 from the refrigeration side myself, as well, so I
16 understand how that works.

17 MR. SHIRAKH: Okay. All right.

18 MR. WATERS: Thank you very much.

19 MR. SHIRAKH: Thank you for your comments.

20 Any other questions or comments? Okay, there's
21 an online comment. So, I think we've unmuted online, if
22 you have any comments, please introduce yourself and go
23 ahead and make it.

24 You're having problems, we can't hear you.
25 Raise your hand or send a chat message. There doesn't

1 appear to be a comment. I can't read that. No,
2 there's -- so, somebody's trying to speak, we can't hear
3 you. What you may want to do is send us a chat message
4 with your question and we'll read it.

5 It's Jamie Bacchus and George, I think, who are
6 the ones trying to make comments. Please type in your
7 message in the chat box and, you know, we'll -- you
8 know, we'll try to respond to it. For some reason we
9 can't hear you.

10 What we're going to do is get on with our next
11 presentation and, again, you know, the commenters,
12 please send us your message and after Jon McHugh's
13 presentation, we'll go back to your comments.

14 Jon, are you ready?

15 Oh, I'm sorry. I'm sorry, Jon, it's not you,
16 it's Bruce Wilcox, the REACH standard.

17 MS. BROOK: Okay, I'm going to make the first
18 part of Bruce's presentation and he's going to follow.

19 So, this is Martha Brook and just to -- just to
20 remind people what we're doing here for REACH Code, this
21 will -- what we develop here and get adopted by the
22 Commission will be placed into Title 24, part 11, in the
23 voluntary appendices of the Green Building Standard.

24 The mandatory Part 11 Energy chapter will
25 basically just reference Part 6 because the Mandatory

1 Green Building Standard is the same as our energy
2 standard for -- you know, for -- that's the
3 requirements.

4 But they do have a voluntary section of the
5 Green Building Standard in Part 11 and that's where
6 these REACH Standards will be placed in the Building
7 Code.

8 So, for residential we're proposing a very --
9 actually, the first two bullets are the same as what's
10 in the voluntary appendices now for REACH Codes. For
11 energy efficiency it's 15 percent beyond the base
12 standard for tier one and 30 percent beyond the base
13 standard for tier two, and this is -- can only be
14 implemented through our performance standard that will
15 calculate the budget and calculate that you've met 15
16 percent better than that budget.

17 We're also introducing a few prerequisites, so
18 these will be requirements. If you adopt tier one or
19 tier two, these will be requirements.

20 And as I mentioned before, we want to encourage
21 a whole house design, you know, a whole house energy
22 rating. We're calling it a design rating because we
23 want to clarify that we don't expect all the
24 requirements of the HERS whole house rating program
25 that's used for existing buildings to be necessary for

1 this. We want this to be really focused on the newly
2 constructed buildings or, you know, major additions and
3 alterations.

4 So, for example, the HERS whole house rating
5 program requirements recommendations to be developed for
6 improvements and we would not expect that to be a
7 requirement of this design rating.

8 So, we still have to figure out what those
9 specific requirements will be and we will be able to do
10 that in our ACM reference manual, we'll be able to
11 specify the design rating.

12 And also, the other thing that we'll have to do
13 is coordinate with the Home Energy Rating System
14 regulations that specify the whole house rating system
15 and make sure that there's no conflict or confusion
16 between these two ratings.

17 So, HERS whole house rating or HERS design
18 rating will be required. We also want to set the
19 quality insulation inspection as a prerequisite. We
20 think this is, you know, basically just encouraging, you
21 know, good builder practice and should be a requirement
22 in all buildings that are trying to achieve advanced
23 levels of energy efficiency.

24 And then similar to what Patrick explained in
25 the builder appliance option, we would have a

1 requirement for high-efficacy lighting. It's the same
2 requirements, hard-wired lighting and occupancy controls
3 in all functional areas, plus Energy Star light kits in
4 all ceiling fans.

5 There has been a lot of discussion about whether
6 or not plug load control should be a prerequisite in the
7 REACH Standard and so I'm mentioning that here so that
8 we can maybe discuss it.

9 We're not -- staff isn't convinced it should be
10 a prerequisite and, you know, it's really hard to say.
11 Because in our -- sort of as we were thinking about what
12 should be a prerequisite, we were basically trying to
13 set the stage for what will be requirements in our base
14 code in our next code cycle. That's sort of like, you
15 know, a short list of things that we really want every
16 building to do.

17 And we're not sure that plug load controls is
18 far enough along in the market to have an understanding
19 of market -- of, you know, consumer acceptance, how are
20 people using plug load controls. We've never had them
21 in our space standard before, even as a compliance
22 option, so it would be a pretty big step to actually
23 require it in a voluntary efficiency standard.

24 Only because, as many of you know, over 40 local
25 jurisdictions are adopting these as mandatory in their

1 local jurisdictions, so that would -- we would basically
2 be requiring all of these buildings to have a plug load
3 control device without really the experience to know how
4 much energy savings we're achieving with these controls,
5 and what the consumer experience is with the technology.

6 But I'm happy to welcome comments to talk about
7 that.

8 And then the other thing that we're adding as
9 a -- it's not a prerequisite, it will be part of the
10 performance standard implementation, we're going to
11 include an energy budget cap for electricity consumption
12 equivalent to, you know, in 10,000 kilowatt hours per
13 year.

14 And the intent of this is to -- and I'm -- you
15 know, we're not the first ones to acknowledge that --
16 acknowledge that an energy-per-square-foot metric that
17 we use in our energy budget process makes it easier for
18 large houses to comply than small houses, and at some
19 point it seems inappropriate to just continue that trend
20 line and not put a cap on whole house energy
21 consumption.

22 Especially when, at this level of electricity
23 consumption, the customers in these homes will be, at
24 least in California, the majority of California will be
25 paying high prices for electricity. And, you know,

1 that -- so it's very, very cost-effective for them to
2 bring that consumption level down. And if that can be
3 done in a regulated building standard, then that's what
4 we want to do.

5 And this is similar to what -- there's a similar
6 budget cap in the existing building HERS program, at
7 2,500 square feet. We're not convinced that a square
8 footage metric is the right one for this budget cap
9 because it really is about overall consumption and not
10 just how big your house is.

11 But there are other whole house type of rating
12 metrics that are starting to be used across the nation
13 and, again, it just adds credence to this idea that we
14 are, in the end, trying to conserve resources. And if
15 we can -- if it's appropriate to do that and cost-
16 effective to do that for large consumer -- you know,
17 large amounts of electricity being consumed in these
18 houses, then we want to address that and this is our
19 attempt to do this -- to do that.

20 For nonresidential we've -- we're looking at a
21 tier one level. Again, this would be implemented
22 through our performance compliance software. A tier one
23 level at ten percent beyond Title 24, Part 6, and a tier
24 two level at 20 percent beyond Title 24, Part 6.

25 We're welcome to hear comments about these

1 levels of efficiency.

2 The reason that we're not going with 15 percent
3 and 30 percent for nonresidential is that our 2013 --
4 our proposed update, as we've presented last week, we're
5 expecting to get 15 to 20 percent improvement in our
6 base code from 2008, and we've heard comments that 15
7 percent beyond that might be a really difficult bar to
8 meet for the first step of a voluntary efficiency
9 standard.

10 The only prerequisites that we're going to be
11 proposing for nonresidential are process load specific.
12 For example there's -- and I didn't have time to -- or
13 room, it looks like on this slide, to include these.

14 Honestly, I just didn't have time to put them on
15 there this morning. There is a supermarket
16 refrigeration REACH requirement for secondary systems
17 and there probably are other process load REACH measures
18 that were proposed, you know, through the workshops
19 we've had, starting in April, that we will gather
20 together and add to the list of requirements for the
21 nonresidential REACH standards.

22 And that's all we have on -- oh, no, sorry. So
23 then the other part of this presentation is -- and the
24 reason that Bruce is listed on the agenda is that we've
25 done some work -- in order to land at that 15 percent

1 for tier one in residential, we asked Bruce's team to do
2 some analysis to see can we actually meet a 15 percent
3 better than our 2013 proposed standard in all climate
4 zones.

5 And so Bruce is going to talk about options
6 for -- that we think are valid and we will be
7 encouraging to meet this level of performance.

8 MR. YASNY: Also, Martha, just to note to you
9 and everyone online that the new WebEx version
10 apparently is part of our problem. We are not seeing
11 chat and we're not able to unmute, so we're going to
12 work on that over lunchtime and see if we can fix that.

13 MR. WILCOX: Okay. So, as Martha said, I'm
14 going to discuss some example measures that could be
15 used for compliance at the REACH levels. And the basic
16 agenda here is to show that they're reachable. I
17 couldn't resist.

18 The caveat here is that this isn't, in no way
19 comprehensive. We haven't tried to include everything
20 and, in particular, we haven't included the things that
21 were discussed earlier in terms of residential plug load
22 controls or high-efficiency appliances, or photovoltaic
23 systems, all of which may be part of this scenario.

24 And I haven't done any work on the
25 nonresidential measures so that's something that will be

1 determined later.

2 So, what I'm going to show here is a series of
3 measures and because we have some kind of -- you know,
4 it's not just WebEx, there's a Power Point thing going
5 on that every time I make up a slide it looks -- those
6 headers look fine, they're all one line on my Power
7 Point, on my computer, and then when we bring them here
8 they all turn out to be two lines and half of them are
9 hidden. So, we have to do something about this in the
10 future here.

11 So, the basic presentation here and I'm going to
12 go through this pretty quickly because it's really
13 intended to give a concept, rather than details.

14 But the basic presentation is there's 16 bars
15 here, one for each of the 16 climate zones, and then a
16 bar to the right which is just for reference. It's
17 weighted by the housing starts per climate zone that
18 we've been using for all of our weighted results in the
19 development of the measures for the standards.

20 And then the Metric on the left here is the
21 savings compared to the staff-proposed base prescriptive
22 standard.

23 And so for upgrading the ceiling insulation from
24 R-30 to R38 in the climate zones -- so this is a general
25 upgrade of the ceiling insulation measure.

1 So, in the zones where it's currently R-30, it
2 would become R-38. Where it was R-38, it would become
3 R-49, so we just simply upgraded one level.

4 And in climate zone one that saves about two
5 percent of the base standard TDV budget, and that's the
6 terms here. This is savings in terms of the base
7 standard TDV budget, which is what's proposed to be the
8 criteria for meeting the REACH Standard.

9 Martha said 15 percent savings and this is
10 consistent with the percent savings I'm showing here.

11 And in order to build excitement, I've sorted
12 these measures in order of average impacts, starting
13 with the smallest ones going up and there are a dozen
14 measures to look at, just to give us a view.

15 So, this -- you know, this is the smallest one
16 in my group, it's a couple percent statewide. This is
17 a -- if you reduce the duct leakage from the current
18 eight percent assumption for the minimum prescriptive
19 standard, if you cut that in half by doing a better job
20 of duct leakage and use the low-leakage air handler, and
21 measured four percent duct leakages, you know, that's
22 also about a two percent effect. It's bigger in some
23 zones and smaller in others.

24 And in general most of the measures that we're
25 talking about here the impact is -- varies by climate

1 zone and that's for two reasons. One is that the loads,
2 the usage of these ducts in this particular case varies
3 by climate zone. And so in climate zone 15 it has an
4 enormous and very long cooling season, so the duct
5 leakage in climate zone 15 is a bigger issue than duct
6 leakage in climate zone 7, which is San Diego, and 15 is
7 Palm Springs.

8 Climate zone 7 is San Diego and the cooling
9 season there is very mild and short so the leakage has a
10 smaller impact.

11 The second reason these things vary is that the
12 base budget for the prescriptive standards that you're
13 starting with varies by climate zone.

14 So, climate zone 15 has the largest total TDV
15 budget and it's something on the order of about five
16 times bigger than the climate zone 7 TDV budget. So,
17 we're getting three percent savings by this duct leakage
18 measure and in climate zone 15 it's actually, probably,
19 15 or 20 times as much energy savings as we're getting
20 in climate zone 7.

21 But since the -- since our context here is 15
22 percent savings of TDV compared to the base standard,
23 then it depends on what zone you're in how much energy
24 that really is saving. Okay.

25 All right, so duct leakage a couple percent

1 item.

2 All right, so here's a -- a better air
3 conditioner duct and fan system. This is moving toward
4 much more what we would think about as an air
5 conditioning system optimized for California climates
6 compared to the minimum standard air conditioner that
7 we're specifying.

8 So, this would say if you reach four -- if you
9 met the criteria of having 450 CFM per ton of air
10 conditioning airflow and used .45 watts per CFM to do
11 that, rather than 350 CFM per ton and .58 watts, which
12 is the base standard criteria, that this would be the
13 relative savings and it's -- as you can see -- oops, let
14 me move back, page down, page up. Okay.

15 So, again, climate zone 15 with the big cooling
16 load has got the biggest impact where it reaches about
17 three and a half percent or so on a statewide basis,
18 where about two percent in the zones where the airflow
19 stuff is -- or where the AC is least important, we get
20 very little savings. Again, it's a big variation across
21 zones and by climate.

22 So, we looked at increasing the thermal mass in
23 the house. And, actually, what we modeled was doubling
24 the sheetrock on the walls. I know there are some
25 people who don't think this is a really sensible thing

1 to do but it's -- there are other ways to increase the
2 mass as well. And so increased mass actually,
3 interestingly enough, as you see, it has the biggest
4 relative impact in the mild climate zones, which are all
5 the climate zones 2 through 8 are on the California
6 coast and that's where the impact is the biggest because
7 that's the zones where you get typically big swings in
8 temperature, and increased thermal mass helps in both
9 heating and cooling, et cetera. And that's we're about
10 three percent relative savings.

11 We've looked at glazing orientation quite a bit
12 in terms of things that could be done to save energy.
13 And this is proposing a -- using a reduced west-facing
14 glass area and having six percent of the glazing facing
15 north, east and south and only two percent of the
16 glazing facing west. And that has a slightly larger
17 impact, as high as five percent in climate zone 7 and
18 about three percent or a little higher statewide.

19 If you get into this glass orientation stuff and
20 it -- the question always comes out where do you stop?
21 If you're going to tell people how to orient the glass,
22 why don't you tell them how to really orient the glass.

23 So, this is sort of a passive solar version
24 where you say, okay, we'll have two percent west, but
25 then we'll make the south-facing glass ten percent of

1 the floor area, and put the other eight -- the remaining
2 glass equally on the north and east sides. And, you
3 know, that has a passive solar orientation stuff works,
4 especially in the heating dominated climates, climate
5 zones 1 and 5, and the cooler climates. But it's
6 still -- it's a significant potential way to approach
7 this REACH Standard I think in all the climate zones.

8 So, here's one that's -- tankless water heaters.
9 The tankless water heater has an AFUE of .82, saves
10 substantial energy in all the climate zones, and
11 particularly in the mild zones where the heating and
12 cooling is small. So, we get more than ten percent
13 savings in climate zones 5, 6, and 7 out of just
14 switching to a tankless water heater.

15 And this is the case where the savings from the
16 tankless water heater varies a little bit from climate
17 zone to climate zone because of the water temperature
18 assumptions in the standard.

19 But you can, conceptually anyway, the -- I can't
20 figure, I just wiggle this thing and it moves it. How
21 do you go back?

22 Yeah, so this is one where the energy savings is
23 roughly the same in every climate zone and you can see
24 the relative size of the base prescriptive standard
25 consumption makes the tankless water heater a big deal

1 in climate zone 7, where you can almost get REACH just
2 out of the water heater, REACH 1, and much smaller in
3 the inland climate zones where there are big cooling
4 loads.

5 So, there are at least two or three versions of
6 ducts and condition space in my presentation here. This
7 is just warming you up for Jon McHugh's presentation,
8 which follows.

9 This is ducts and conditioned space in the case
10 where you have the furnace in the attic. The attic is
11 covered up by the flag there, sorry.

12 And so this is the version, this is the
13 requirement for the ACM rule that covers the case. You
14 have your air conditioning coil, and your supply plenum
15 and your furnace in the attic, and the ducts are all --
16 you know, immediately dive down into conditioned space.

17 And the rules in the ATM manual say in that case
18 you -- if you verify that the ducts are all located in
19 the conditioned space, but you still have to then assume
20 that the return leaks are in the attic, and you do have
21 to do duct sealing and you have to account for that.

22 But, you know, if you do that you save
23 significant energy between -- in most of the cooling
24 climates between five and ten percent, seven percent on
25 a statewide weighted basis.

1 And it's a big deal in climate zone 16 where
2 it's cold and -- both cold and hot, and so forth.

3 So, we've talked quite a bit about conditioned
4 attics and having a compliance option for conditioned
5 attics, and I think we've worked out, at least for the
6 moment, a pretty straight forward ACM approach for
7 modeling conditioned attic.

8 And there are -- you know, if you assume that
9 the conditioned attic house has the same leakage,
10 overall envelope leakage as the house with the normal
11 attic, which is what the assumption is here. You know,
12 we're sealing the attic up enough so that the overall
13 system ends up with the same ACH 50.

14 Then we can save a lot of energy in many
15 climates here and that could be a significant measure.

16 One of the reasons that these savings aren't
17 bigger is that our base case prescriptive standard has a
18 whole house fan in climate zones 10 through 15. And
19 there's no way to do a conditioned attic with a whole
20 house fan of the traditional kind because the whole
21 house fan blows air into the ventilated attic and that's
22 how it works.

23 So we give up in this measure, the way it's
24 analyzed here, we give up the whole house fan so that
25 reduces the energy savings in these cooling climates 10

1 through 15. It's not an issue in the zones where we're
2 not proposing to require whole house fans, which is all
3 the others, 1 through 9 and 16.

4 So that, you know, on a statewide basis is about
5 seven percent.

6 Night breeze is an alternative ventilation,
7 cooling and ventilation system and so this measure is
8 you use a night breeze system instead of a whole house
9 system, and that can offer big energy benefits in the
10 zones where it really works well. Particularly, right
11 here in Sacramento, about 20 percent on TDV.

12 And, you know, it depends entirely on the
13 climate whether a night breeze or whole house system, a
14 whole house fan system really saves energy. And it
15 doesn't work very well in the very hot climates because
16 it doesn't cool off at night.

17 And it doesn't do anything for you in climate
18 zones 1 and 5 where we don't have any cooling load to
19 speak of, but it works pretty good in the Inland and the
20 Central Valley climates.

21 Okay, so here's another big hit here. This is
22 using an evaporative condenser air conditioning system
23 instead of a normal air conditioning system.

24 There's a compliance option that was developed
25 by FREUS and put in the standards prior to 2008, and

1 it's in the 2008 standards, and it allows compliance
2 using performance for systems using evaporative
3 condensers.

4 An evaporative condenser is essentially a -- you
5 replace the normal outdoor unit on your air conditioning
6 system with one that uses a water system to cool and
7 condense the refrigerant. And it's evaporative only on
8 the outdoors. There's no evaporative cooling of the
9 house, it's just simply making the air conditioner more
10 efficient.

11 And there are -- there's a system on the
12 market --

13 MR. SHIRAKH: Like the FREUS system?

14 MR. WILCOX: Well, like FREUS. Beutler is
15 marketing, what's it called, an Aqua Chill system and
16 it's been tested in a couple of utility programs.
17 Southern California Edison has done a bunch of testing
18 on those systems and SMUD has had a pretty extensive
19 program using the Aqua Chill system in a number of
20 houses, and they are both reporting that these things
21 save a lot of energy, seem to be reliable, seem to work
22 well, and et cetera.

23 So, we think this is a real option for the REACH
24 standards in -- at least in the hot cooling climates.

25 So, here's the other conditioned space duct

1 system. This is -- if you have an AC system that's all
2 in conditioned space, so that you don't have your
3 furnace in the attic, you somehow get the furnace inside
4 the conditioned space and you do the duct leakage to
5 outdoors measurement to show that you have essentially
6 no duct leakage to outdoors, which this is a procedure
7 that's defined in 2008 standards to get this credit,
8 then you can basically -- or you have no duct system,
9 you have an AC system that -- you know, a mini-split air
10 conditioning system or something where you don't have
11 ducts in unconditioned spaces, then that's a substantial
12 credit in all the climate zones, particularly in the hot
13 inland zones.

14 And so we're getting close to ten percent out of
15 that one measure. And this is related, also, to Jon
16 McHugh's presentation coming up.

17 So, the question is how do we look in terms of
18 meeting that 15 percent REACH code threshold; do we have
19 enough measures to do it? And so, you know, kind of
20 just to look at relatively how we're doing in each
21 climate zone, I added up the percentage savings from the
22 measures that are actually -- that don't duplicate each
23 other, we didn't double count here on this version.

24 I've been known to double count previously,
25 including the one that I posted yesterday, but this one

1 we fixed.

2 And so we're getting -- except for climate zones
3 1 and 5 we're getting -- you know, all of these climate
4 zones are at least twice as many measures as you think
5 you would need to reach that 15 percent.

6 And so even given that they're going to interact
7 with each other and the total savings will be less than
8 this simple additive thing, you know, things look pretty
9 reasonable.

10 You have to keep in mind that the -- when you
11 put a number of these measures together it's going to
12 probably result in less savings than you get measure by
13 measure. And that's because if you're going to do ducts
14 in conditioned space and you're going to do an
15 evaporative condenser, evaporative condenser efficiency
16 is much better so you don't save as much on the ducts in
17 conditioned space. And so the loads are smaller, so the
18 evaporative condenser doesn't have as much work to do,
19 so you won't save as much with that. So, the whole
20 package will have less savings than this simple approach
21 here.

22 But as a screen, I think this is relatively
23 optimistic in terms of the 15 percent level.

24 MS. BROOK: Can you tell me, Bruce, what you
25 mean when you said you didn't double count?

1 MR. WILCOX: I didn't count ducts in conditioned
2 space twice.

3 MS. BROOK: Oh, oh, oh, oh, oh. Okay. But
4 there wasn't --

5 MR. WILCOX: On good days I can figure out how
6 to do that, how to not count that --

7 MS. BROOK: Okay, but there weren't any other
8 conflicts as far as --

9 MR. WILCOX: No.

10 MS. BROOK: Okay.

11 MR. SHIRAKH: But this -- the interactive
12 effects aren't -- haven't been taken into account?

13 MR. WILCOX: Yeah, these are not --

14 MR. SHIRAKH: So, it's going to actually be very
15 significant, I imagine.

16 So, again, that would be September 12th instead
17 of the 10th for the comment.

18 MR. WILCOX: Okay, so that's the presentation,
19 I'll be happy to answer questions.

20 MR. RAMER: Thank you; Bob Ramer, with
21 California Building Industry Association.

22 A couple points, going back to Martha's comments
23 on plug load. We certainly are very supportive of
24 seeing various plug load initiatives being brought into
25 the standards.

1 The problem here is making it a prerequisite, as
2 you well know, there's very little familiarity
3 throughout industry with this right now. But this is
4 definitely an area that we've got to get a handle on and
5 get a handle on it quickly.

6 So, to the extent that compliance options, be it
7 with the standards, themselves, or with the REACH 1 and
8 REACH 2, it would be very useful.

9 I just don't think when -- you know, part of the
10 problem here is you're producing what jurisdictions can
11 adopt relatively easy and one of the odd things that
12 we've seen over the past couple of years, with the
13 advent of Cal Green, is that jurisdictions will adopt
14 Cal Green minimum and then go, boom, right to a 15
15 percent set of energy codes increase, without really
16 looking at what that means.

17 MS. BROOK: Uh-hum, uh-hum.

18 MR. RAMER: And so I suspect that if you just
19 simply put this in there as a prerequisite, it's quite
20 possible that you could have adoption in jurisdictions
21 where this doesn't get much, if any, discussion at all.
22 It could kind of float through and then they find out,
23 gosh, we have a problem, we can't get our hands on this
24 stuff, we don't know how to deal with it.

25 And so there needs to be some learning curve

1 here but we don't want to, you know, pooh-pooh the idea,
2 it's good, and so it takes the --

3 MS. BROOK: Yeah, and that's the challenge that
4 we have because it's the type of technology where it
5 does seem to the Commission staff that it needs to be
6 mandatory. The problem with it being a compliance
7 option is we have no way to value the savings.

8 MR. RAMER: Right, I understand.

9 MS. BROOK: So, yeah.

10 MR. RAMER: And, you know, some of the appliance
11 efforts as opposed to necessarily plug load strategies,
12 may be easier -- you know, maybe two percent for this,
13 four percent for that and six, you know, on.

14 MS. BROOK: Uh-hum, uh-hum.

15 MR. RAMER: Anyway, kind of moving on, I'd like
16 to for a moment go back to November of 2010, when we had
17 sort of the kickoff workshop.

18 MS. BROOK: Uh-hum.

19 MR. RAMER: And at that point in time the Energy
20 Commission was discussing the potential for a REACH 1
21 and REACH 2, but that is substantially different from
22 what we're talking about right now.

23 MS. BROOK: Uh-hum.

24 MR. RAMER: At that time we were looking at
25 having, perhaps, three different ways of calculating

1 cost effectiveness, and that for REACH 1 --

2 MS. BROOK: Uh-hum.

3 MR. RAMER: -- we'd be looking at economics
4 based on equal sharing of costs, reduced carbon with
5 future generations.

6 MS. BROOK: Uh-hum.

7 MR. RAMER: And then REACH 2 would have been the
8 zero net energy reg building.

9 MS. BROOK: Uh-hum.

10 MR. RAMER: Clearly, the Energy Commission has
11 chosen to go with the 15 and 30 for residential.

12 To us, you know, we were very -- although we're
13 certainly dealing with a very stringent set of standards
14 and adding onto that of course creates design and cost
15 issues.

16 There is a lot of sense in going with 15 and 30
17 because as you indicate, as you go to 2017 and 2020
18 there needs to be familiarity of where those next stair
19 steps are going to be, and application of the REACHs
20 could help that.

21 MS. BROOK: Uh-hum.

22 MR. RAMER: And what was being discussed back in
23 November was going to kind of work counter to that. It
24 was actually, in our view, it was going to scare people
25 away from using it.

1 MS. BROOK: Well, let me -- just to clarify what
2 we presented in November, it wasn't a different stair
3 step approach, it was just a different valuation of the
4 societal costs of energy.

5 And we are still going to help local
6 jurisdictions, if they want to use either of those REACH
7 TDV metrics for them to justify their own adoption of
8 stringent codes, that's sort of really the reason that
9 we developed those, in part was so that anybody adopting
10 a stringent energy efficiency standard locally could
11 have a basis for making the determination that it was
12 cost effect.

13 And, you know, hearing that that's why they're
14 doing it is because they're trying to have a local --
15 you know, have local action that really helps do climate
16 change in a way.

17 MR. RAMER: Uh-hum.

18 MS. BROOK: And so having a societal cost of
19 energy that really has a focus on climate change was
20 certainly an intent of that.

21 But we also think it's very important that we've
22 set voluntary standards that -- that have the ability to
23 be judged consistently with our base standard, and
24 that's why we're using the base TVD. So, in a way it's
25 -- it puts a harder challenge in front of us. So, in

1 other words, either of the REACH TDV would make these
2 things more cost effective. And we're not even, really,
3 doing cost effectiveness right now.

4 MR. RAMER: I understand.

5 MS. BROOK: So, I don't think we ever intended
6 to not do the stair step, but it was just a different
7 way we were going to propose to look at cost
8 effectiveness.

9 MR. RAMER: I appreciate that. The last sort of
10 comment, the nonresidential versus residential;
11 residential 2013 is looking at a higher level of
12 increase in base minimum code. We're also looking at 15
13 and 30 as opposed to 10 and 20.

14 I'm not understanding why the difference for
15 non-res versus res in both the mandatory standards and
16 the REACH, why -- you know, we're all heading towards
17 zero net energy --

18 MS. BROOK: That's right.

19 MR. RAMER: -- and I understand they've got a
20 much longer date to get out there but, at the same time,
21 depending on the commercial facility a 15 percent versus
22 25 percent increase in, you know, initial standards is
23 significant. Why can't you share the pain?

24 MS. BROOK: So, I don't think -- I think we are
25 trying to have equity and we need to -- we need to

1 figure out what that means. I mean it's a percent of a
2 much different number. And we do have different zero
3 net energy goals and residential is ten years sooner.
4 And it's sort of the -- you know, the 15 and 30 for the
5 two tiers allows us to set our next mandatory standard
6 somewhere between there and still be on the path to zero
7 the way that we think we need to be.

8 And for nonresidential we have six, rather than
9 three code cycles and we potentially could do a 60
10 percent improvement over six code cycles with a ten
11 percent difference.

12 And then -- and then again to -- it's sort of
13 consistent with where we're landing on our update, we're
14 getting between the 15 and 20 percent with the
15 nonresidential standards and our tier sort of split that
16 different between tier one and tier two.

17 But we do need to get more feedback from Savings
18 by Design and other advance, nonresidential efficiency
19 programs. So, let us know if that's not aggressive
20 enough, then we need to know that.

21 MR. RAMER: I'm just jealous.

22 MR. SHIRAKH: And related to non-res and of
23 the -- you know, the date is 2030 and I really think we
24 cannot seriously talk about zero net energy about non-
25 res without considering terminally driven chillers,

1 moving away from electric chillers, solar cooling and
2 things like that. And we've had some discussions but
3 because of the workload here we've been postponing it.

4 But I think after things wind down here we need
5 to kind of go back and revisit those and try to create
6 the conditions in the market for those technologies to
7 commence in --

8 MR. RAMER: I agree, midrise and high rise are
9 going to be huge mountains to cross on that.

10 MR. SHIRAKH: Right.

11 MR. RAMER: Lastly, we've kind of gone around on
12 this numerous times, to getting back to plug load and
13 other things. If we're going to get the cost of that PV
14 system down, not only in square footage but in cost, we
15 have to look at the unregulated electricity use of that
16 house.

17 And we'll be very supportive of efforts that can
18 kind of move us in a reasonable fashion to transition to
19 that. So, to the extent we can do pilot programs with
20 the Commission and any host of other things, we'll be up
21 for that.

22 MS. BROOK: Okay, great. Thanks.

23 MR. SHIRAKH: Bob, while you're here, related to
24 dryers, Mike Keesee's point, what about the compliance
25 option for if the builder provides a gas hookup and 110

1 volt, no 200.

2 MR. RAMER: Uh-hum.

3 MR. SHIRAKH: And --

4 MR. RAMER: Right now I would like to chat with
5 Mike, but I think the most common dryer that's going in
6 is gas. And so I -- and I don't really foresee and AB
7 32 problem with that, if we're talking about
8 residential, and that's one of the relatively few uses
9 of gas in the house.

10 So, that certainly would be a viable option.
11 For one thing consumers seem to like it and it would
12 definitely help with his peak load issue so, yeah, we're
13 up for it. Okay, thank you.

14 MR. SHIRAKH: Okay, thank you.

15 Mike Gabel?

16 MR. GABEL: I'm Mike Gabel, just to address one
17 of Bob's questions. I mean we've done a lot of analysis
18 at looking at reducing, you know, energy use below
19 baseline for the 2008 standards, and when you get into
20 commercial buildings, as a lot of people here know, it's
21 a completely different beast.

22 And you have these very large ventilation loads
23 and lighting loads that you can't get down below certain
24 levels given the needs of commercial buildings, so it's
25 just like in a different universe, but I appreciate your

1 point.

2 Question on the REACH Code. The tier one, just
3 to refresh my memory, I think you said something about
4 possibly not allowing the solar PV and high-efficiency
5 lighting appliance options to be part of that or is
6 that -- did I misunderstand that?

7 The understanding was you can use the potential
8 other compliance options and actually have a building
9 that thermally is below the Title 24, but you get to a
10 REACH Code with solar PV and some other things?

11 MS. BROOK: Well, those are things we need to
12 talk about.

13 MR. GABEL: Okay.

14 MS. BROOK: So, certainly, we don't want to --
15 just because somebody put in PV or builder appliances to
16 meet X percent of the base budget doesn't mean we want
17 to give them credit for the other part of those -- the
18 energy use of those equipments for a REACH Code.

19 So, we need to figure -- we need to figure that
20 out.

21 MR. GABEL: Okay, so staff hasn't really decide
22 positively how to approach that, yet?

23 MS. BROOK: Right. So, you know, likely we
24 would have those same options available to meet the
25 REACH Code, it's just we can't be double counting that

1 credit.

2 MR. GABEL: Right. Okay, thanks.

3 MR. SHIRAKH: John?

4 MR. ARENTZ: John Arentz, AEC. I just had one
5 general comment for the Commission staff, not so much on
6 the residential and Bruce's presentation.

7 This is just an idea I had, so I'd like to see
8 what people's thoughts are on it. But one possible
9 prerequisite for non-res REACH could be certification of
10 energy modelers because, as we know there's a lot of
11 variation within the industry. And as we move towards
12 multiple programs being able to be certified as
13 compliance software, the problem's only going to get
14 stickier.

15 So, you know, in the more extreme case you can
16 have an energy modeler with maybe -- is inexperienced,
17 with all good intentions, modeling some kind of a tricky
18 system and ends up getting -- showing that it meets
19 REACH when, in fact, maybe the building might not even
20 comply with the standards.

21 MS. BROOK: Uh-hum. And so I know the ASHRAE
22 Building Energy Modeler Certification, is there other --
23 are there others?

24 MR. ARENTZ: That's the main one that I know of.
25 The last time I looked there's not a great number of

1 people that have the BEMP certification, but I think
2 that's in part due to the fact that it's not really
3 required anywhere.

4 MS. BROOK: Uh-hum.

5 MR. ARENTZ: So, if it were required by say for
6 energy ratings or for REACH, then it could become more
7 common.

8 MS. BROOK: Okay, thank you John.

9 MR. SHIRAKH: Pat?

10 MR. EILERT: Thanks. So, Bruce what are your
11 cost effectiveness assumptions for all of these
12 measures?

13 MR. WILCOX: Say again?

14 MR. EILERT: What are your cost effectiveness
15 assumptions for all of these measures? Are you assuming
16 that they're cost effective by climate zone?

17 MR. WILCOX: I haven't done any cost
18 effectiveness calculations, yet. These are not argued
19 to be cost effective.

20 MS. BROOK: So, these are suggestions for
21 meeting a voluntary level of energy efficiency, so we
22 didn't do the same level of rigor to justify it and also
23 didn't do an integrated analysis for those measures.

24 MR. GABEL: Mike Gabel, just to address the
25 question about certification of energy modelers.

1 MS. BROOK: Uh-huh.

2 MR. GABEL: So, the California Association of
3 Building Energy Consultants, CABEC, is working on, with
4 the Commission's blessing and the blessing of the IOUs,
5 with the IOUs' support, a revisiting of the entire
6 process of getting -- this is a voluntary certification
7 program for people doing analysis. And it will be both
8 residential and nonresidential.

9 And, of course, it won't be required, but it's a
10 process by which we hope to show that there's going to
11 be greater robust training and testing of people, which
12 might result down the road of some other requirement, or
13 prerequisite but we'll --

14 MS. BROOK: Okay.

15 MR. GABEL: -- we'll discuss that with you as --

16 MS. BROOK: Okay and are you considering
17 something like a national certification to be equivalent
18 or somehow get easier access into the CABEC
19 certification?

20 MR. GABEL: Well, we're sort of looking at the
21 ASHRAE thing.

22 MS. BROOK: Okay.

23 MR. GABEL: We're staying in touch with people
24 who are familiar with it and sort of tracking it.

25 MS. BROOK: Okay.

1 MR. GABEL: And our understanding of it is it's
2 still in the early -- the ASHRAE thing is still in the
3 early stages as well.

4 MS. BROOK: Uh-hum.

5 MR. GABEL: And we'll be having more to say
6 about that so --

7 MS. BROOK: Okay. Okay.

8 MR. HODGSON: Mike Hodgson, ConSol, representing
9 CBIA. I want to visit the locally adopted section,
10 which was actually a previous presentation, but it was
11 mentioned also here.

12 MS. BROOK: Uh-hum.

13 MR. HODGSON: We're talking about trying to be
14 similar and rigorous in our approach on either cost
15 effectiveness or energy design and not double counting.

16 The impression I have or at least I think the
17 market has of when you adopt a local code, and pass it
18 as a local ordinance, all it has to do is arrive on
19 paper to the Energy Commission and it gets approved.
20 And the requirements and the rigor of which what is cost
21 effective and what's not cost effective is moot, it's
22 not even reviewed.

23 So, it would be interesting and I think
24 appreciated if you did, in Section 10-106, talk and
25 expand that language of locally adopted codes that

1 whatever local jurisdiction is reviewing those codes to
2 go above code that use the same analytical and cost-
3 effective techniques that are required by the Energy
4 Commission. And you could give them a draft, a sample,
5 you know, like what is cost effective and how do you
6 analyze the energy impact?

7 Because in reviewing these codes of local
8 jurisdictions, they're all over the place.

9 MS. BROOK: Uh-hum.

10 MR. HODGSON: I mean they could be from
11 someone's PG&E bill and, you know, they said I did this
12 and it works in two years, and so I would like to make
13 it a standard.

14 As far as I can see, the Commission would accept
15 that and the Building Standards Commission does the same
16 thing because it's basically a repository for codes,
17 it's not an approval process.

18 So, I think that would be very helpful to have a
19 common ground so that we actually could understand
20 whether these codes are cost effective or save energy.

21 On a different issue, Martha, you were talking
22 about rating metrics and this is an issue we brought to
23 the attention of the Energy Efficiency staff for about
24 the last year. And that is, is that the market is
25 driven in production home building by national players.

1 MS. BROOK: Uh-hum.

2 MR. HODGSON: And they are using a different
3 scale than what California uses, which is the resident
4 scale.

5 And it would really be useful, because the
6 market is now rating their product, new homes have
7 ratings on them. And I use that term because that's
8 what they're doing is they're rating them. And in
9 California we're supposed to be using the HERS scale,
10 which no one does.

11 And so RESNET has a different scale, different
12 algorithms, different math to figure out what the
13 scale -- what the numbers should be and it would really
14 be useful if we could get a conversation between the
15 Energy Commission and the product home builders, who are
16 using the scale, and RESNET, and try to come to some
17 common agreement, which I'm not sure if that's possible.

18 But the discussion hasn't occurred and we've
19 tried to encourage it for over a year now.

20 So, if we're going to have rating metrics, and
21 we like market-driven rating metrics, then the market
22 currently is using a scale that California doesn't
23 recognize, or the California Energy Commission doesn't
24 recognize and that's the RESNET scale.

25 So, if there's anything that we can do, CBIA can

1 do to help that conversation, we know who the players
2 who are using the scales, we can invite them to a
3 meeting here at the Commission and try to talk about it,
4 but I think when it gets down to the actual math
5 someone's going to need to dissect what the differences
6 are and what it's impacts are for the State of
7 California.

8 MS. BROOK: Yeah, and it's going to be -- I
9 agree, it's not trivial, it's going to be hard for the
10 Commission to move away from using the same basis that
11 it uses to derive the recommendations for standards
12 updates for the rating method. And RESNET is a much
13 different, like you said, set of algorithms and math to
14 determine that.

15 And it will be hard for us to see the value in
16 doing that when, basically, we think that we're putting
17 more attention to that, those algorithms, and they're
18 more detailed and they --

19 MR. HODGSON: Well, I agree, I think the
20 Commission has a better process. I'm not objecting to
21 that at all.

22 MS. BROOK: Right.

23 MR. HODGSON: I'm just saying that you're out
24 of -- the market is not responding to that process
25 because we don't use that scale.

1 MS. BROOK: Right, right.

2 MR. HODGSON: There are national players --

3 MS. BROOK: I wonder if there's a way that we
4 could figure out what the crosswalk is between the two,
5 so that --

6 MR. HODGSON: That's a possibility or maybe you
7 influence RESNET to play by your rules.

8 MS. BROOK: Yeah, good luck with that, right, I
9 mean --

10 MR. HODGSON: Well, you have to have a
11 conversation.

12 MS. BROOK: Yeah, yeah.

13 MR. HODGSON: And right now we don't have a
14 conversation.

15 MS. BROOK: Right, right.

16 MR. HODGSON: And I'm encouraging that
17 conversation to start.

18 MS. BROOK: Okay. Okay.

19 MR. HODGSON: And we can bring the players who
20 actually are impacted by the --

21 MS. BROOK: Right.

22 MR. HODGSON: -- building scale.

23 MS. BROOK: Right, yeah.

24 MR. HODGSON: But the perception right now,
25 we're talking about rating metrics, the residential new

1 construction market totally ignores the California
2 Energy Commission's rating metrics.

3 MS. BROOK: Okay. Well, because we haven't ever
4 asked them to do it, right.

5 MR. HODGSON: Well, theoretically, I think
6 there's a law --

7 MS. BROOK: We've never asked them to do it.
8 HERS has always been focused on existing buildings to
9 date.

10 MR. HODGSON: Isn't there a State law that if
11 you do a rating in the State of California, you have to
12 use the California Energy Commission's rating technique,
13 scale? That's my understanding of the law.

14 MS. BROOK: But what I'm saying is that this is
15 the first time that a whole building -- if we implement
16 a HERS requirement, a rating requirement, it will be the
17 first time that it gets applied to newly constructed
18 buildings.

19 MR. HODGSON: My understanding is the HERS 2
20 rating scale that we discussed and adopted three years
21 ago, from a zero to 250 covers new construction.

22 MS. BROOK: But it was never -- there was never
23 a program in place that implemented it.

24 MR. HODGSON: Well, I don't think there's a
25 program, but I do think there's a law.

1 MS. BROOK: Which is why we have to -- we can't
2 do this -- we can't do this design rating without
3 figuring out how to go into that law and make
4 modifications.

5 MR. HODGSON: And all I'm doing is encouraging
6 that conversation to occur sooner than later.

7 MS. BROOK: Okay, good.

8 MR. HODGSON: Because we're trying to rate
9 homes, we're trying to get to zero, what does zero mean,
10 and California's being kind of left out of that
11 conversation.

12 MS. BROOK: Uh-hum.

13 MR. GABEL: Mike Gabel, just to address Mike
14 Hodgson's question about locally adopted standards, I
15 agree there's a whole lot of chaos out there and all
16 sorts of calculations turned in on napkins by local
17 governments about cost effectiveness.

18 Not a lot, but there's some. And I think that
19 Warren Alquist, unfortunately, says what the rules are
20 with respect to the Commission and their approval
21 process. And so unless you change Warren Alquist,
22 you're kind of stuck with the current status quo, in my
23 opinion.

24 MR. SHIRAKH: Okay. Jon?

25 MR. MC HUGH: Jon McHugh, McHugh Energy. Going

1 back to Martha's presentation earlier. A couple of
2 things, I thought I should bring forward. One is
3 that -- my understanding is that Cal Green still doesn't
4 cover, what is it, high rise residential. I can't
5 remember if they cover hotel/motel, but I know at least
6 high rise residential is not covered. And so that would
7 be a significant area to expand the coverage of Cal
8 Green and, of course, the REACH standards, too. So,
9 that's good news.

10 The next one is the -- you know, prerequisites
11 are essentially a place to go beyond the base standard
12 for things that aren't in the ACM. And so, you know,
13 you've brought up a lot of issues around, you know,
14 supermarket refrigeration, which is not as part of the
15 ACM.

16 But also another place is essentially lighting
17 that is in unconditioned and outdoor spaces, those are
18 also not in the ACM.

19 And I'm a member of the ASHRAE Standard 189.1,
20 which is the standard for high performance buildings,
21 and we use a similar kind of format for going beyond the
22 ASHRAE 90.1 nonresidential energy code and for the 189
23 standard we have higher standards for buildings. And in
24 particular, for outdoor lighting, we have higher
25 requirements, or more stringent requirements, or lower

1 lighting power allowances for outdoor lighting.

2 And I've been talking with the CASE author, who
3 did the work on the base standard lighting LPA and he
4 thinks that there's some opportunity, you know, for more
5 stringent LPAs for those REACH standards, and I'd like
6 to make sure that's, you know, thought about.

7 MS. BROOK: Okay, great, thank you.

8 MR. MC HUGH: Thank you.

9 MR. SHIRAKH: Any other questions on the REACH
10 Standards? Mike?

11 MR. MC GARAGHAN: Mike McGaraghan, Energy
12 Solutions. First, I just wanted to touch on the plug
13 load controls issue and thanks to the Commission for
14 bringing that up today, even though it's still sort of
15 in flux.

16 But what I'm hearing from the Commission is that
17 you're reluctant to move forward on that type of a
18 measure without data demonstrating how practical or
19 how -- you know, what the savings trends are.

20 And what I'm hearing from the building industry
21 is that they're very interested but lacking motivation
22 to really push it out there. And I think what they
23 could use and what they're saying that they need is more
24 indication from the Commission that the Commission is
25 moving in that direction towards plug load control

1 codes. So, it's sort of a chicken or the egg problem.

2 MS. BROOK: Uh-hum.

3 MR. MC GARAGHAN: Obviously, there's other
4 opportunities and other methods that we can take to try
5 to get the technology out there, whether voluntary
6 programs, or Energy Star, but to the extent that we can
7 move this forward now and that we don't want to miss an
8 opportunity I just -- I want to keep this discussion
9 going.

10 And, certainly, I'll follow up with Mike and
11 Bob. Mike mentioned that a couple tract builders are
12 starting to look into plug load controls. I don't know
13 if they've already started installing them or if it's an
14 idea coming down the pipeline but, you know, if we can
15 collect some of that data in the near term, maybe we
16 still have a chance to look at that and see if the
17 savings are there and if they're reliable.

18 Other options would be to look at things like
19 set-back thermostats and see if we can draw some
20 comparisons to the way residential consumers are
21 responding to that sort of a voluntary savings
22 opportunity in their home, or to compare with
23 nonresidential applications of plug load controls, which
24 are already installed, and make some comparisons there
25 to how well the controls are working and the savings

1 that are being achieved.

2 So, I think that's all I wanted to say, just
3 that I'm glad that it's, you know, in the discussion
4 here, and let's try to push it forward.

5 MS. BROOK: And one thing that -- one thing that
6 we could do, again to try to raise awareness of the
7 technology, is to include it as a compliance option, but
8 significantly de-rate any kind of savings estimates from
9 it. Just so that, again, it gets into our compliance
10 manual, people understand that it's an option that we'll
11 be considering more and more in the future, but
12 currently, you know, maybe it gets a tenth of its
13 expected energy savings or something, I don't know.

14 We have to be careful because a tenth of plug
15 load could still, you know, trade away some pretty
16 important efficiency features. So, that's -- I agree
17 that we should keep talking about it.

18 MR. SHIRAKH: Well, even for a degraded
19 compliance option how would you -- where would you
20 start? We don't have any data to show what kind of
21 savings we can expect from this, unless we get something
22 from the builders or --

23 MS. BROOK: Well, we have non-res that's --

24 MR. MC GARAGHAN: Yeah, just some of the ideas
25 that I was just mentioning, we could look at non-res

1 savings and just the Residential CASE report, too, takes
2 an approach to establishing a savings methodology just
3 by outlining applicances.

4 MR. SHIRAKH: And non-res would be what, like
5 offices? I mean that's so different from residential,
6 where you've got kids, and teenagers and --

7 MR. MC GARAGHAN: Sure. Sure. So, the approach
8 in the Residential CASE Report outlines -- you know, it
9 looks at all the typical appliances and electronics that
10 are in homes and their rate of distribution in homes,
11 their standby wattage, their off-mode wattage, their
12 duty cycles.

13 So, you know, it sounds like the HERS Whole
14 House program also has a table of assumptions about
15 appliance frequency and duty cycles that we could
16 compare to.

17 MS. BROOK: Uh-hum.

18 MR. MC GARAGHAN: And so that's the way we've
19 built a savings analysis so far and I think we've taken
20 a pretty conservative approach to it. We're not
21 assuming any savings from lights getting left on all
22 night or electric heaters that are on all night, all the
23 savings that we've shown are here and there, a watt or
24 two, or three watts from electronics, mostly, that are
25 left on, you know, either in standby or off.

1 And that analysis came up with savings numbers
2 that showed that the controls would be cost effective
3 using REACH TDV so, you know, that's the approach we've
4 taken so far and we can compare other numbers and other
5 vehicles to --

6 MS. BROOK: Okay.

7 MR. SHIRAKH: Thank you, Mike.

8 Any other questions?

9 MR. FRANCISCO: I'm Jim Francisco with Sierra
10 Consulting, and we've spoke before on condition attic
11 spaces and such. All I want to do is deliver a letter
12 from a developer, he wanted to get information in front
13 of you with facts on unconditioned -- or on conditioned
14 attics and closed attics.

15 MS. BROOK: Great.

16 MR. FRANCISCO: I've delivered it.

17 MS. BROOK: Thank you.

18 MR. SHIRAKH: It's been delivered, thank you.

19 Any other questions, comments? I guess folks
20 online can't comment.

21 Sorry about this. Please, if you have comments,
22 e-mail me. My e-mail address is on the slide, and we'll
23 try to respond to your comments via e-mail.

24 Apologize. When WebEx works it's great, when it
25 doesn't it's horrible.

1 So, if there's no more questions or comments
2 we're going to -- I guess there was an agreement to
3 basically wrap this up before lunch.

4 So, Jon McHugh is going to talk about
5 conditioned ducts and conditioned space. And you can
6 either take my spot or sit over there.

7 MR. MC HUGH: Good afternoon, this is Jon McHugh
8 and I'm here on behalf of the California Statewide Codes
9 and Standards Program, and talking about a prescriptive
10 proposal for ducts and conditioned spaces.

11 And this builds on a number of activities done
12 in a number of different areas. One is back in 2000 was
13 a PIER research program on looking at bringing ducts in
14 conditioned spaces. And the reason for this is -- you
15 know, should be kind of readily apparent.

16 You know, we've spent over the last 20 years
17 increasing levels of effort of trying to address the
18 inherent problem of essentially having 50 degree air in
19 the hottest portion of the house.

20 So, you've got a duct full of 50 to 55 degree
21 air, it's separated from 140 degree air in the attic by,
22 you know, R-6, R-8 duct insulation and, at the same
23 time, has issues associated with leakage.

24 And so a number of different groups have looked
25 at bringing ducts into conditioned spaces, whether it's

1 for Energy Star, or the various Beyond Code programs,
2 the efforts toward zero net energy buildings.

3 You know what, this seems to be a fairly common
4 measure across all of those various activities where
5 we're not trying to sort of trim around the edges but
6 actually do something substantial in terms of how
7 conditioned air is brought into a space.

8 And so this picture here shows a variety of
9 different ways of bringing ducts into conditioned
10 spaces. The conventional one, on the upper left, is the
11 conventional method of just having the ducts in the hot
12 space, but we can also create chases in the space and
13 bring the -- or in the building and bring the ducts
14 below the insulation level, or we can make cathedral
15 ceilings, increasing the volume of the space.

16 The other nice aspect to that is now our thermal
17 boundary, our vapor boundary and our pressure boundary
18 are all in the same location.

19 Or we can use a scissor truss, which is
20 essentially like an attic, has all the same features in
21 terms of it being ventilated, et cetera, except it's got
22 a different shape, and so we can hide the ducts,
23 essentially, in the conditioned space.

24 And, you know, in contrast to where we're going
25 right now, where I mean insulating the roof duct has a

1 substantial impact on the energy consumption of
2 buildings. You know, in general you're taking something
3 where the ducts, instead of being in 140-degree space,
4 in Sacramento summer it's now going to be essentially
5 around that ambient air temperature, around 110 degrees.
6 But we've still got 55-degree ducts in 110-degree space.

7 And, you know, if you think in terms of resource
8 efficiency, we're essentially taking two layers of
9 insulation to do what we really should be doing with one
10 layer of insulation. So, you know, this is actually
11 quite similar to a measure that I brought to the
12 Commission staff back in 2005, around insulating drop
13 ceilings where we have -- we have a layer of insulation
14 and then we have air that's essentially bypassing the
15 insulation.

16 Well, we're purposely bypassing the insulation.
17 But, of course, this insulation on the roof deck has a
18 lot of impact, it is knocking down the temperature and
19 is addressing the issue of absorbed solar radiation on
20 the roof.

21 So, you know, moving forward looking at, you
22 know, there's a variety of different methods that we can
23 use. We can essentially make a little sort of mini-
24 attic where we have a vented cathedral ceiling. We have
25 a ventilated space that's acting similar to the

1 ventilated space in the attic and we've just shrunk that
2 down and now we've moved all the ducts and all the
3 conditioned space right underneath the roof.

4 There's also thoughts about using unvented
5 cathedral ceilings, where we use air impermeable
6 insulation. Basically, use foam, fill up that cavity.
7 The same kind of idea, we -- there's a -- again, we have
8 the benefit of the air barrier, the thermal barrier and
9 the moisture barrier all in the same location, keeping
10 the ducts in the relatively cool, unconditioned -- or
11 conditioned space.

12 And now we've got that R value of, you know, R-
13 38 or R-30 between the outdoors and the cold air in our
14 air conditioning ducts.

15 So, this is the sort of scissor truss, and this
16 is one way of doing this. So, you have a truss, you --
17 and it just has a different shape to it. It has
18 insulation just like a ceiling, or just like an attic,
19 so it's keeping the -- it's still got a ventilated
20 attic, just like a standard attic, it just has a
21 different shape to the floor of the attic.

22 And then it allows you to put ducts inside the
23 conditioned space and yet still have the standard look
24 of a, you know, flat ceilings that people are used to.

25 Some people may choose to have the different

1 shape but if, you know, just to keep it similar to what
2 people are used to, you can just tie the ducts with some
3 drywall.

4 And the costs are actually not -- are not very
5 substantial. You know, I guess I rate -- at this point
6 I should make note that much of this work was done by
7 John Arentz, of Architectural Energy Corp, and he's
8 under contract to the CASE team.

9 And in talking with the truss manufacturers he
10 found that, you know, the cost is around 18 cents a
11 square foot for the modified truss. And then that --
12 that the cost for the prototype that we've been using
13 for, you know, evaluating the efficiency standards,
14 we've been using this 2,700 square foot prototype house.
15 For that, the truss cost is \$260 and then there's
16 additional drywall and taping so that we're maintaining
17 this pressure boundary, and it's fireproof and airtight.

18 And overall there's slightly more additional
19 insulation cost because now we actually have more
20 surface area.

21 So, this has a fairly small incremental cost of
22 \$160.

23 And then depending on how you install the
24 insulation, you might need some netting that would add
25 some additional cost. In addition, there's some costs

1 that when we looked at the benefit cost of this
2 particular measure we said, well, let's -- we have some
3 additional savings, but we'll just consider them gravy,
4 essentially.

5 And one is that you can save -- you know, for
6 these prototypes save around \$200 plus for duct
7 insulation using the values that were used for the
8 package A development.

9 There's -- as we'll see, there's HVAC downsizing
10 opportunities somewhere between, you know, a fraction of
11 a ton and all the way up to a ton in some of the climate
12 zones.

13 Depending on who you talk with, this could
14 actually simplify envelope sealing especially if you're
15 using a cathedral ceiling. All this costing has been
16 done for the scissor truss just because it is so
17 comparable to the base case or typical construction
18 practices so that in terms of folks saying, you know,
19 we're not used to building buildings in this different
20 way, you know, we looked at one of the actually more
21 costly, but more comparable methods of building houses.

22 And this is probably a little bit small to read
23 but, you know, so we estimated somewhere around \$1,400
24 and this comes in line with the builders' estimates in
25 the peer study. And the documentation is here and

1 we'll, of course, post it on the website, or ask the CEC
2 to post that.

3 In addition, ConSol has done some work on this
4 very subject and in there they describe a -- in one of
5 their articles about bringing ducts into conditioned
6 spaces, the added cost for a production builder was only
7 \$500 to bring ducts inside a conditioned space. This is
8 a slightly different situation where they're putting
9 ducts in the floor truss and building a sealed and
10 insulated mechanical room.

11 And this is noted here, this is Ryan Kerr's
12 paper, back in 2008, in home energy.

13 So, we made use of the new simulation model and
14 these comparisons are relative to the 2008 standards.
15 We had a -- and I'll show a table in just a second which
16 has sort of, you know, all the details.

17 But, you know, present value to energy cost
18 savings between 60 and almost \$4 per square foot, which
19 is similar to, you know, Bruce's findings, described
20 earlier, somewhere between 9 and 15 percent of the
21 overall energy consumption of the regulated energy
22 components.

23 And I looked at the -- I compared this to the
24 package A, I decomposed the package A measures and this
25 had between two to five times more energy savings than

1 placing R-13 underneath the roof deck. So, you know,
2 slightly more cost, but substantially more energy
3 savings.

4 When I looked at this, you know we had a benefit
5 cost ratio. There was only one climate zone where the
6 benefit cost was less than one. And, you know, most of
7 the climate zones the benefit cost ratio was over two
8 and as high as six in climate zone, I believe that was
9 15.

10 Now, this is, you know, using current costs. My
11 expectation is that the market is very good at, you
12 know, squeezing out costs. But nonetheless this was
13 cost effective in all zones, except climate zone 5. And
14 there's potentially some, I believe, synergies with the
15 envelope sealing requirements, especially related to the
16 requirements for compliance that Bruce has described
17 earlier.

18 Reduced material expenditure and also I think
19 prepares the market -- if, indeed, what we're trying to
20 do is prepare the market for zero net energy buildings,
21 it's my expectation that we won't see buildings with
22 ducts in unconditioned spaces in the future.

23 If you look at what people have been doing for
24 the zero net energy building pilot projects, in general
25 they're not putting ducts in those conditioned spaces.

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1 You know, some people say, well, you know, there
2 might not be any ducts at all in the future in spaces.

3 But if we believe that our concerns about indoor
4 air quality is going to require mechanical ventilation,
5 especially in the very hot and very cold climate zones,
6 we're likely going to need to temper the air and that
7 implies that, you know, air systems might be around for
8 a while outside of the mild climate zones.

9 So, here's some of the numbers and, of course,
10 there's too much details there to really go through.
11 But the main thing is, I would say is, you know, if you
12 assume a total cost, you know, described here of around
13 \$1,700 per a 2,700 square foot house, this is a two-
14 story house, and I believe it was around 1,500 square
15 feet of roof area, the benefit cost ratio is -- like I
16 said is between essentially just below one in climate
17 zone 5 to, basically, 6 in climate zone 15.

18 Again, additional sort of gravy that I mentioned
19 earlier, this describes the reduction in tonnage using
20 the equipment sizing roles that are in the standards and
21 using the assumption of \$300 per ton per equipment.

22 So, you know, there are some feasibility issues,
23 I'm sure some folks will be talking about this later on
24 about, you know, this is a new way of designing
25 buildings. You know, but to some extent, you know,

1 cathedral ceilings have been around for decades. But in
2 terms of a broad implementation that's only two and a
3 half years out, in terms of putting heating in
4 conditioned space, you know, we have a limited
5 subsection of appliances that you can put in the -- you
6 know, you need to either seal the combustion furnace, a
7 heat pump, or a hot water coil and the air handler. You
8 know, those are different implementations of different
9 types of keeping the combustion out of the conditioned
10 space.

11 And so there is an issue in terms of preemption
12 in that the minimally compliant furnace is typically,
13 you know, an atmosphere -- you know, it's an atmosphere
14 type furnace.

15 And so the other, you know, sort of preemption
16 compatible method is to use the sealed mechanical room,
17 as described in the ConSol article.

18 And we would need some code clarifications on
19 what is the latest thinking on what is allowable for
20 cathedral ceilings. You know, there's different
21 philosophies about it. I would think that vented it is
22 compatible with all the codes, but I would imagine that
23 some folks might push for unvented cathedral ceilings,
24 with potential energy and cost savings.

25 So, as a proposal, what I'm suggesting here is

1 that we actually make that bold step towards zero net
2 energy buildings and look at something that actually is
3 fairly simple and relatively constant across climate
4 zones, because this method is actually cost effective
5 across a broad range of climates.

6 So, looking at basically ducts inside a
7 conditioned space whether -- you know, however you
8 wanted to implement that.

9 The envelopes tested and sealed to three air
10 changes at 50 Pascals. This is in keeping with the
11 Federal minimum residential efficiency standard against
12 which California is going to be compared against over
13 the next couple of years.

14 And in terms of when you talk with folks who
15 actually do envelope sealing, they say that three
16 percent -- or that three air changes is something that
17 they regularly accomplish or exceed.

18 Also, and I'll talk about this in the other
19 presentation, about the package A, R-21. 24 inch on
20 center walls are cost effective or sort of within the
21 margin of error of cost effectiveness. You know, I
22 think the life cycle, you know, had a negative -- either
23 there was two climate zones where the life cycle cost
24 was -- or life cycle cost savings was negative \$50. So,
25 you know, in terms of consistency and ease of

1 enforcement having a, you know, single standard for wall
2 construction and U-factor seems to make a lot of sense.

3 I think, you know, there's been a great job done
4 on the glazing description and I think that's fairly
5 straight forward.

6 And then, of course, we're kind of stuck with
7 the federal minimum efficiencies but, in turn, there
8 could be credit for folks actually taking actually
9 simpler and, potentially, less costly methods where
10 they're using sealed combustion or other methods like
11 combined water and space heating, et cetera.

12 So, I believe that is my presentation.

13 MR. SHIRAKH: Thank you, Jon. Any questions or
14 comments on Jon's presentation?

15 The question is was the presentation --

16 MR. MC HUGH: Oh, was this posted? Oh, okay.
17 So, no, I will send the revised version, yeah.

18 MR. SHIRAKH: So --

19 MR. MC HUGH: Actually, Mike, do you have any
20 comments about what you've seen in terms of ducts in
21 unconditioned spaces in -- see any buildings in your
22 program?

23 MR. KEESEE: Well, we have limited experience
24 with it. We're going through an exercise with the
25 builder right now, that ConSol's familiar with, that we

1 can't publicly disclose. It's not easy given current
2 construction practices. However, Habitat for Humanity
3 here, locally, has got one. It's got the scissors
4 approach. I think they're going to have some issues
5 with getting insulation in those trusses, but they're
6 doing it.

7 And that's the challenge I give to my production
8 friends is that if Habitat can do it, maybe others can.

9 So, but it's absolutely essentially if you're
10 going to get to zero energy, no ifs, ands or buts about
11 it.

12 So, that's the way it's going to be. Maybe
13 there's a whole way of looking at HVAC that we've never
14 thought of, which is get away from air and go to water-
15 based systems. I would love to try and do that on the
16 radiant cooling side, I just haven't been able to put
17 that together, yet.

18 MR. SHIRAKH: Thank you, Mike. Any other
19 questions or comments on duct in conditioned space?

20 Mike, you're cool with this proposal?

21 Okay, I guess there's no online. And, again, I
22 apologize, send your e-mails to me and we'll try to
23 respond.

24 MR. MC HUGH: So, I've got another--

25 MS. BROOK: We wanted to open it up for general

1 comments, now, on any topic before we close.

2 MR. SHIRAKH: Wait, he has another presentation.

3 MS. BROOK: Okay, so this is -- I thought we
4 agreed that you were going to present whatever you're
5 going to present next as part of our general comments
6 because we didn't have an agenda item for you, which is
7 fine.

8 MR. MC HUGH: Is it okay if I present --

9 MS. BROOK: Yeah.

10 MR. SHIRAKH: Okay, Jon's got another
11 presentation on the packages, so go ahead, Jon.

12 MR. MC HUGH: Thanks. So, this is a some
13 thoughts about another path for selecting measures for
14 package A.

15 And you guys can correct me if I've got this
16 wrong, my understanding of the process was that you
17 looked at, you know, a variety of cost-effective
18 measures but then at the end of the day there was
19 essentially a cap placed on just how much pain the
20 building industry could accept, you know, what is the
21 first cost.

22 And I thought -- what I thought what I heard
23 underlying that was a concern about affordability of new
24 construction.

25 And our understanding of affordability is maybe

1 a little bit more nuance than just the issue of what is
2 the first cost. And this kind of takes this approach
3 that, you know, if the sum of the mortgage costs and
4 energy costs is less expensive with higher levels of
5 efficiency is that building that costs less on a monthly
6 basis, is that indeed less cost effective, even though
7 it's first cost was higher?

8 And should we be looking at other metrics? You
9 know, because first off there's this cost effectiveness
10 metric and, clearly, we're not going all the way to the
11 bleeding edge in terms of cost effectiveness and there's
12 sort of this idea to kind of step back a little bit.

13 And the question is, well, how far do you go?
14 We can say what is the minimum threshold for saying
15 something's cost effective, but is there any sort of
16 maximum that, no, we're not going to do more than
17 something this particular code cycle and -- and go
18 ahead, Pat.

19 MR. SAXTON: Yeah, so, Jon, I think you're
20 substituted cost effective for affordability here from
21 time to time.

22 MR. MC HUGH: Okay, thanks. So, the issue is,
23 is there another way of looking at this, you know, the
24 issues of cost effectiveness and affordability to try to
25 come up with another metric that may help guide what we

1 should be looking at?

2 And, you know, as mentioned here, the -- you
3 know, if we look at our hottest climates, because those
4 buildings use so much energy and they have such high
5 energy costs, it's not surprising that to get to
6 comparable percentages of savings that you might be
7 spending more to, you know, save quite a bit of life
8 cycle cost.

9 So, you know, there are a variety of different
10 packages that were initially run, and this is at the
11 other meeting where we described sort of the maximum
12 efficiency package, one that looked at minimum life
13 cycle cost as you looked at all the measures combined.

14 And then sort of a package three which looked at
15 some political feasibility issues, and then looked at a
16 cap, you know, placed on first cost.

17 And so I took a look at this same data and
18 looked at one measure at a time which, you know, to some
19 it's like -- I looked at all the measures at that
20 maximum efficiency level and then varied one measure at
21 a time and this would give me a conservative estimate of
22 the value, of the savings, so it was actually making
23 them less efficient from that maximum efficiency level.
24 One at a time and then leaving all the other measures at
25 their highest efficiency.

1 And then what I did was I looked at this and
2 identified which ones had a benefit cost ratio over one
3 when you looked at them individually, not as a -- you
4 know, not sharing savings across measures and looked at
5 that over the period of analysis that's required for
6 residential measures, which is the 30 years, and kept
7 track of these various parameters.

8 So, the other way to look at this analysis is to
9 do a cash flow analysis and using the customer's
10 viewpoint, and taking our nominal three percent or, I'm
11 sorry, our real three percent discount rate and
12 decomposing that into a nominal five percent interest
13 rate and a nominal energy escalation rate of two
14 percent, kind of work your way back to that three
15 percent real discount rate.

16 So, I looked at the same 30-year period of
17 analysis that you look at for a typical residential
18 mortgage, looked at a ten percent down payment, again
19 fairly typical of mortgages or at least maybe prior to a
20 year ago.

21 And also then -- also evaluated these various
22 cash flow metrics. So, how much am I spending each
23 month? Is my savings from my -- from these various
24 energy features, are they saving me more money than the
25 incremental cost of the mortgage payment that I have for

1 those features?

2 And then, also, how long does it take to
3 actually pay back my down payment for those features.

4 And then, if I essentially borrowed money for my
5 down payment how long would it take to pay back from the
6 savings associated with my utility bills and the
7 difference between my utility bills and my mortgage
8 payments to maybe pay off this additional loan for my
9 down payment?

10 So, I looked at all three of those metrics and
11 then I looked at various measures. And so this was one
12 of the measures which was evaluated, which was wall
13 insulation of a particular climate zone and it had a BC
14 ratio of 1.6.

15 You know, so I had an incremental cost of \$400,
16 ten percent down payment was \$45, and then that resulted
17 in an annual loan payment of \$36. And, also, on the
18 first year I'm saving \$37.

19 Now, if you look over at the utility savings,
20 this utility savings escalates two percent per year, but
21 my payment, just like a regular mortgage, is fixed. So,
22 I have my \$45 up front that I paid for the ten percent
23 of the measure and then -- and then over -- you know,
24 and then each year I'm paying my \$26 mortgage payment
25 for the -- for the additional cost of the measure.

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1 And by the first year my net cost that I'm
2 paying is -- I've had this first cost, but by the first
3 year I'm saving money on my combined utility bill and my
4 mortgage payment, so I'm positive in terms of my cash
5 flow on an annual basis.

6 And then by the fourth year I've essentially
7 paid off my down payment, whether you look at it in
8 terms of a -- in terms of nominal dollars, or even if I
9 borrowed money I would have paid off that loan for that
10 down payment within four years.

11 So, what this shows is that this looks fairly
12 attractive for the consumer in terms of affordability
13 for measures that have this BC ratio of greater than
14 1.6.

15 Now, here's one where this is a measure that's
16 kind of marginal, it has a BC ratio of 1.08, so it's
17 just barely squeaking by in terms of its cost
18 effectiveness. And there the -- it takes four years
19 before I even see a nominal positive cash flow on an
20 annual basis and it takes, you know, 16 years before I
21 see I've paid off that down payment. And if I borrowed
22 money for that down payment, it would have taken me 21
23 years before I saw a discounted positive cash flow,
24 cumulative cash flow.

25 So, when you do that you realize that all of

1 these things are essentially -- all of the other
2 variables are essentially fixed except the benefit cost
3 ratio. And from that what you can do is then
4 parametrically vary the benefit cost ratio and then you
5 can start seeing, you know, what happens in terms of --
6 you know, if I have a benefit cost ratio of 1.1, it
7 takes a long time until I head up the years to positive
8 cash flow.

9 Whereas, you know, once I'm at essentially, you
10 know, 1.3 I've got a positive cash flow in the first
11 year and, you know, if I use a BC ratio of 1.5 you can
12 see that I end up paying off my down payment within six
13 years total.

14 So, with that in mind then you start you say,
15 okay, let's pick a metric. You know, whatever you feel
16 is the appropriate metric in terms of identifying what
17 is the appropriate time line to pay back my down payment
18 and then take a look at the results.

19 And so that's exactly what I've done. The
20 shaded areas identify what's the cost of -- you know,
21 kind of Warren Alquist cost effective in terms of BC
22 ratio greater than one.

23 But let's say, you know, for instance if you
24 used a BC ratio of 1.5 or 1.3 you'd start saying, okay,
25 in climate zones 11 and 13 I really should be moving to

1 R-8 duct insulation, if I'm looking at duct insulation.

2 By the way, what I'm doing is I'm comparing the
3 staff-recommended proposal to the maximum savings
4 package. And then in cases where the space -- the cells
5 are shaded it indicates, hey, I could actually go to a
6 more stringent requirement and be cost effective for
7 each of these measures.

8 And then even amongst those shaded ones I could
9 then choose, also, I look at the far right column and I
10 can choose my benefit cost ratio and say if I use a
11 benefit cost ratio as a criteria potentially I can
12 actually bring other -- you know, trim this down a
13 little bit more.

14 So, for instance, in climate zone 9 I might say,
15 well, you know, this is a benefit cost ratio of 1.05,
16 it's kind of squeaking by. And if I use some criterion
17 like, for instance, 1.3, I'd say, well, in this case the
18 climate zone 9 I wouldn't increase -- or decrease the
19 infiltration rate.

20 But for climate zone 10, and 11, and 12, and 13,
21 et cetera, I could increase the stringency of the
22 standard, still provide, you know, whatever I've decided
23 as the appropriate metric of affordability and then that
24 actually helps provide a kind of a systematic way for
25 evaluating these measures.

1 A similar kind of thing for QII, you know,
2 certain climate zones it makes sense to -- especially
3 the hot climate zones.

4 You look at roof deck insulation, what this
5 indicates is that higher R values could be used for roof
6 deck insulation than what's in the proposal.

7 You know, including some, like if you look at
8 climate zone 9 and 10, BC ratio of 20, that's -- you
9 know, that's paying back in that first year, you know,
10 not -- you know, everything is getting paid back very
11 fast in that kind of situation.

12 And then if you look at wall -- this is wall
13 insulation and there's a bunch of things where it says
14 divide by zero. Now, this is the fairly small changes
15 of, you know, saying, well, we're going to use the 24
16 inch on centers as the basis, so there's essentially no
17 cost. And, in fact, some people could argue that
18 there's actually a reduced cost in using the larger on-
19 center spacing.

20 But it also indicates that, you know, some of
21 the areas where we've kind of -- we've stuck to four-
22 inch studs and R-15 walls, you can look at, for
23 instance, climate zones essentially 2 through 5, you
24 know, these are all BC ratios over one and a half.
25 Again, relatively fast payback.

1 So, it gives you a fairly consistent method to
2 look at these various -- a systematic way of evaluating
3 the measures.

4 And so I'm coming down to the conclusions which
5 is that first cost is not a good measure of
6 affordability. We have some other ways of evaluating
7 affordability, like looking at cash flow. And recommend
8 that we at least look at a minimum, you know, criteria
9 of one year to positive annual cash flow.

10 And as an example, a BC ratio of greater than
11 1.3 gives you that one year annual positive cash flow.
12 It shows the eight year payback of the down payment and
13 then, you know, 22 years of further savings for the
14 homeowner.

15 And if you did that, then you would --
16 potentially, you know, what I've -- you know, if I just
17 consistently applied that rule, then you could increase
18 the stringency as described in those bullets.

19 And now this is -- and that this is extremely
20 conservative. You know, the definition of cost
21 effective is, you know, taken in its entirety.

22 So, ideally, you would actually look at your
23 packages, use the BC ratio metric. You know, I've done
24 it just on individual measures.

25 But, you know, ideally, you would take your

1 packages and say here are these packages and they're
2 hitting a particular BC ratio.

3 And then this just shows if you use BC ratios
4 greater than one, so this is the sort of the Warren
5 Alquist BC ratios.

6 But, you know, if you use 1.3 what you can see
7 is a benefit cost ratio of 1.3, it really doesn't change
8 the outcome that much. There's a bunch of energy that's
9 still left on the table that is cost effective and also
10 provides an appropriate cash flow for the consumer.

11 So, thank you.

12 MR. SHIRAKH: Thank you, Jon. Any comments on
13 Jon's presentation on cost effectiveness methodology?

14 Pardon me? John?

15 MR. ARENTZ: John Arentz, ADC. Yeah, just one
16 comment, Jon, thanks for this analysis, it's a different
17 way of looking at it.

18 But, you know, one thing also to consider when
19 we're looking at the integrated analysis is that the
20 benefit cost ratio is just one metric.

21 You know, when we look at doing interactive
22 effects and loading order another way is to take the
23 measure that has the most energy savings first, so make
24 sure we capture that so that we don't lose that in the
25 end game. But thank you.

1 MR. SHIRAKH: Mike?

2 MR. HODGSON: Yeah, a quick comment. Mike
3 Hodgson, ConSol, representing CBIA.

4 You know, I think it's a good analysis and it's
5 an interesting analysis, but one of the issues that
6 comes up besides energy is on air infiltration. We have
7 an issue about indoor air quality. You know, we've made
8 a fairly large case as we're very concerned about
9 reducing air infiltration rate. It may be a great
10 energy idea but there's other interactions in here.

11 So, I mean this is, I think, a pretty straight
12 forward way of looking at it, which I think is useful.
13 But I think when you start picking packages you've got
14 to -- like a previous speaker said, you've got to start
15 looking at other issues, also, in addition to that.

16 MR. MC HUGH: And I'd just like to point out
17 that, you know, when we do the case studies and, of
18 course, all these evaluations, that cost effectiveness
19 in addition to feasibility. And so you're absolutely
20 right in terms of air quality, that's an issue.

21 But, you know, presumably that's why we have
22 mechanical ventilation in these spaces.

23 MR. HODGSON: Presumably, you're correct.

24 MR. MC HUGH: Yeah.

25 MR. HODGSON: Yeah.

1 MR. SHIRAKH: So, again, I would just add to
2 what Mike said. I mean there's cost effectiveness is
3 the first criteria, then there's nothing in the Warren
4 Alquist Act that says that if it's cost effective it
5 shall be adopted. I mean that's just the first.

6 On the question of, you know, we had, actually,
7 in our package the recommendation for ACH-50, but we
8 actually got comments from our sister agency, Air
9 Resources Board, who were adamantly opposed to that.

10 So, other things come into play rather than just
11 BC ratio and, you know, we're obligated to consider all
12 comments, not just cost effectiveness.

13 Pat?

14 MR. SAXTON: So, I guess one of the questions
15 is, you know, where do we go from here because the whole
16 point of this was just to take a poke at this issue of
17 what we call affordability, there's more than one way to
18 look at this.

19 So, questions of the staff that, you know, does
20 it make sense to sort of take a look at alternatives to
21 the staff proposal for package A at this point?

22 MS. BROOK: Yeah, I guess what we could do is
23 look at Jon's presentation and see if we missed
24 anything, if there's something that's blatantly
25 affordable, and it's cost effective, and it doesn't have

1 any of the other issues that Mazi was alluding to, then
2 we can certainly do that. But I don't think --

3 MR. SHIRAKH: I mean, we must --

4 MS. BROOK: -- any of the issues that we were
5 grappling with, that got us to arrive at package A-3
6 have changed and we still have all those issues. So, I
7 don't know, maybe it would help if we summarized those
8 so you would understand where we're -- if we're not
9 being as aggressive as you think we ought to be, you
10 understand why we're not. I don't know, we can
11 certainly do that if you think it would be helpful.

12 MR. EILERT: Well, I don't think we've really
13 addressed the issues sufficiently. I mean when we're
14 looking at sorts of measures for which -- for which in
15 the first year, you know -- you know, the energy savings
16 exceeds the cost of the mortgage, for example.

17 Now, we ought to have a really good reason not
18 to include that in the standards and so far I haven't
19 heard them on some of these measures.

20 MS. BROOK: Okay.

21 MR. EILERT: One of the issues that's been
22 brought up by industry is the need for education and
23 training and, at a minimum I think it -- you know, we've
24 started a conversation statewide about how we can sort
25 of take a look at some of these big changes and develop

1 an educational program around that.

2 You know, I've spoken to the manager of our
3 energy centers and so we will develop a plan over the
4 next few months to do that, so there will be support in
5 that area going forward.

6 MS. BROOK: Okay.

7 MR. EILERT: But again, I just don't feel -- I
8 just feel like we're leaving a lot on the table and I
9 just haven't heard, you know, very good reasons for not
10 doing some of these things and maybe it is clarification
11 in part. Thanks.

12 MR. SHIRAKH: One of the things I need to
13 mention is that the package A-3 has not -- given that we
14 can't actually adopt everything that's in it, there's
15 still a lot of comments related to the specific measures
16 that's in A-3 that we need to -- I mean, it's not like
17 that A-3 is the baseline and it's given, we can move
18 forward from there, you know. We still have to do a lot
19 of work to -- for instance, the roof deck insulation has
20 a -- you know, this is something that I've been
21 advocating myself all along. It still has a whole host
22 of issues related to it, to moisture, to fire, to
23 building practice and, you know, which education would
24 probably address some of that.

25 So, you know, we're not even sure that we're

1 going to have A-3 as a slam dunk at this point.

2 MR. EILERT: So, you know, we don't want to
3 ignore these issues, but where those issues don't occur,
4 you know, we think there's this -- this is another good
5 way to look at affordability and I'll just leave it at
6 that.

7 MR. SHIRAKH: Thank you, Pat.

8 Mike?

9 MR. GABEL: A quick procedural question. So, in
10 October, from the original schedule, that you're going
11 to have sort of a preliminary draft express terms
12 summary of the standards.

13 MS. BROOK: Uh-hum, uh-hum.

14 MR. GABEL: Are you going to have kind of a
15 summary of the staff's final determination on the
16 package A measures before then or is it -- are we going
17 to kind of wait until then to see where the staff comes
18 out on some of those?

19 MS. BROOK: Yeah, I mean I think our -- our idea
20 is to keep you informed all the way along.

21 MR. GABEL: Okay.

22 MS. BROOK: So, maybe we could talk about how to
23 do that. I mean, I -- I mean we don't want to have any
24 more workshops because we have to start writing code
25 language.

1 MR. GABEL: Yes.

2 MS. BROOK: So, I don't know, what do you think,
3 Mazi, is there a way that we can say before the end of
4 September what we are going forward with, with the
5 package?

6 MR. SHIRAKH: We can post it on the website.

7 MS. BROOK: Okay, so I guess as soon as we think
8 that we've resolved all the issues and we're firm on
9 going forward, we could -- we can post a summary of the
10 residential package.

11 MR. SHIRAKH: For the 2008 standards we actually
12 had a one-day workshop where we presented actual code
13 language. It is still, you know --

14 MS. BROOK: Well, actually, it might be more
15 than one day, but that's what was intended by the
16 schedule that says -- it was like in light blue, and it
17 said something in the first week of October. The idea
18 is that we would present all the code language changes
19 in one or two workshops, with our Efficiency Committee
20 attending, so they can hear any remaining issues that
21 all parties have on what staff's proposing.

22 So, that's what that first October 7th -- it's
23 not that date, but we're targeting that week.

24 MR. SHIRAKH: So, that's definitely something we
25 can do, which is sort of analogous to what we did in

