

STAFF WORKSHOP
BEFORE THE
CALIFORNIA ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION

In the Matter of:)
)
Preparation of the Draft Phase II) Docket No.
Home Energy Rating System) 08-HERS-1
Program Regulations)
_____)

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

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Bill Pennington

Bruce Maeda

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Charles Eley

Dan Suyeyasu

Architectural Energy Corporation

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P R O C E E D I N G S

10:02 a.m.

MS. LAM: Good morning, again. Welcome to the California Home Energy Rating System program, or the HERS workshop for phase II of the regulations development. I know many of you have traveled great distance to be here, so we appreciate your interest and participation.

My name is Helen Lam; I am the Project Manager for the HERS Phase II contract. And I like to introduce some of the key people here. We have Bill Pennington. He is the Office Manager for the Buildings and Appliances Standards. And Bruce Maeda, my colleague, as well as Rashid Mir. They are the Technical Advisors to the HERS project.

And we have from Architectural Energy Corporation, our prime contractor, Charles Eley, who will be the presenter today. And his assistant, Dan Suyeyasu. We also will have in attendance the Advisors to Chairman Pfannenstiel and Commissioner Art Rosenfeld. Because of other obligations they can't be here, so they will be represented by their Advisors.

If you look at your agenda -- we have

1 copies out there, if you'd like to grab one -- at
2 the end of each major topic presentation we will
3 have time set aside for public comment. If you'd
4 like to come up to speak at the podium, just
5 remember each time to state your name and
6 organization so that this will benefit the court
7 reporter. And if you have a business card, it
8 would be helpful to hand it to him so that he will
9 have your exact spelling, the correct spelling of
10 your name.

11 And at this time I'm going to turn the
12 meeting over to Bill Pennington, and he's going to
13 give some brief background information regarding
14 the Commission's effort leading up to the
15 development of the phase II regulations for HERS.

16 MR. PENNINGTON: So, thank you all very
17 much for coming. I'm sure a lot of you feel like
18 this has taken forever for us to get to this
19 stage. The Commission has had the responsibility
20 to develop a HERS program, and develop the
21 approaches for overseeing that program for years.
22 And we never really found the ability to get to
23 it.

24 There were not resources allocated with
25 the original legislation, and that just is a

1 killer. I don't know if anybody can relate to
2 that, but you know, if there's no resources at the
3 beginning it's just, you know, it's an attempt to
4 take it out of your hide kind of direction, and
5 it's very difficult.

6 We developed some considerable momentum
7 to developing the HERS program in 1998 and 1999.
8 And actually developed the original framework for
9 the program at that point. The program got a
10 little bit hijacked at that point by the
11 electricity crisis that occurred in 2000 and the
12 need to dramatically increase the frequency and
13 scope of building standards and appliance
14 standards. And the Commission turned its
15 attention to that area at that time.

16 We really found value in having a
17 structure of HERS raters, and so we applied that
18 authority we had to creating the capacity of HERS
19 raters to deliver fuel verification for building
20 standards. And I think that, you know, with maybe
21 some mixed reviews, has been quite successful in
22 many respects. And it's been a way to kind of
23 ease into what we're about to, by getting the
24 structure of that put in place.

25 So now we're here to go on to what we're

1 calling phase II of the HERS work, and develop
2 processes that would apply to doing whole house
3 home energy ratings and energy audits relative to
4 existing homes, newly constructed homes and
5 existing homes, and developing that system. And
6 so that's what we're proposing at this point.

7 We're really kind of at an early stage
8 here. The HERS program is a tool; it's kind of
9 not how would you use this tool, in perhaps a
10 variety of ways, but it's trying to get the tool
11 created. And how do you conduct these HERS
12 ratings and how do you oversee them, and how do
13 you get them to deliver consistency.

14 So that's where we're at at the moment.
15 We're really not here to talk about the many ways
16 that you might apply this tool. But we're trying
17 to get your feedback on what we put together in
18 terms of the initial proposal that we have here
19 for the tool.

20 And to a certain extent today's work is
21 a technical product. We're laying out how
22 software would be used, and how the structure
23 would operate and so forth, quite technical. And
24 so we're interested in your feedback related to
25 getting the technical merits of this put together

1 well. And so that's really what we're about here
2 today.

3 We are intending to go through, as the
4 agenda shows, on a topic-by-topic basis. And
5 there's quite a bit of content that we want to
6 present to you on each topic. We'd like you to
7 hold your comments until we finish that content.
8 And then we would like your feedback on that
9 content.

10 It would be preferable to have you focus
11 on the portion of the agenda that we're at, at any
12 point in time, rather than make, you know, a
13 global statement or a global presentation or
14 whatever. So, I know that might be difficult for
15 you, and challenging for you to organize your
16 remarks based on the sections that are on the
17 agenda, but that's what we would like you to do if
18 you can.

19 So, thank you very much for being here.

20 MR. SUYEYASU: Are you going to start
21 off, Charles?

22 MR. ELEY: Just to introduce things.

23 Okay, my name is Charles Eley with
24 Architectural Energy Corporation, and we're the
25 contractor to the Energy Commission on this

1 project. We have two subcontractors, Martin Dodd
2 with EnergySoft, and Tom Conlon with GeoPraxis.

3 We're breaking the agenda, today, into
4 two pieces. The morning is a little bit more
5 policy and regulatory oriented. And the afternoon
6 is going to be much more technical. So that's
7 kind of the breakdown.

8 So we're going to try to deal with more
9 of the regulatory policy issues this morning. Dan
10 Suyeyasu will be making the presentations on scope
11 and application and the entities that are
12 recognized. I'll be covering the HERS reports.

13 So, with that, I'll turn it over to Dan
14 to begin the presentation on the scope and
15 application issues.

16 MR. SUYEYASU: It's a little bit awkward
17 with my back to everybody, but I'll try to face
18 some of you.

19 This is the sort of fundamental point of
20 the new regulations is to set up a standardized
21 process by which somebody can get a rating or a
22 California home energy audit for their home. You
23 cannot save energy in a house if you don't --
24 well, you can, but it's not very easy if you don't
25 actually know how much energy it's using to begin

1 with, and where that energy is going.

2 As with cars or appliances that have
3 mile-per-gallon ratings, or energy guide labels.
4 When you're buying a house, you also need to know
5 if you're going to compare it to some other house
6 and its energy use, you need to have a
7 standardized format that can be used from one
8 house to another.

9 And this regulation says that if you're
10 going to use a California whole-house home energy
11 rating on a house, it needs to be produced in
12 compliance with these regulations. This is the
13 only way to produce that rating, the one and only
14 way.

15 Just a quick note at the beginning here
16 is that one thing we talked about a lot as we're
17 developing these rating principles is that you
18 need to rate the home and not the occupants. A
19 lot of people think about a home; the amount of
20 energy it uses is dependent on the structure of
21 the house and the components of the house. But
22 it's also based on who's living there and how
23 they're using it.

24 The ratings that we're producing look at
25 the house and the structure of the house, alone.

1 They don't look at the actual usage pattern of any
2 one individual. They sort of assume a
3 standardized individual using sort of standardized
4 behavioral patterns. So the rating is totally
5 independent of who is living there.

6 We also do, in our regulations, when
7 people are making recommendations, give the rater
8 or the auditor the potential to produce
9 recommendations that are based on behavioral
10 pattern of the particular homeowner or occupant of
11 the house. So they can look at your occupancy
12 schedule, if you're gone on the weekends, if
13 you're out in the summer, you know, if you have
14 six people in a three-bedroom house, something
15 that's abnormal, they can adjust to your specific
16 behavioral patterns if they need to.

17 So there is a standardized rating and
18 recommendation report that we'll be producing.
19 And then there's one customized to particular
20 users, as well.

21 What we're doing now is phase II of the
22 HERS program, and Bill discuss this already.
23 Phase I was what was developed originally to sort
24 of establish the relationship between providers
25 and raters in the state, and how the CEC would

1 approve providers. And it mostly focused on, in
2 the implementation phase on the ground and doing
3 fuel verification and diagnostic testing with the
4 Title 24 energy efficiency standards.

5 Now we're moving to phase II, and we're
6 expanding the scope of this program to get to one
7 of the primary original which is so that
8 homeowners can have a standardized rating scale
9 that they can use to look at homes. Homes they're
10 going to buy, homes they're living in already.
11 They want to know just how efficient is this home.
12 To some degree it's a black-box to a lot of
13 homeowners.

14 The purpose of this program, and this is
15 directly from the authorizing legislation, is to
16 insure consistent, accurate and uniform ratings
17 based on a single statewide rating scale; insure
18 reasonable estimates of potential utility bill
19 savings and reliable recommendations on cost
20 effective measures to improve energy efficiency;
21 and then provide training and certification
22 procedures for the raters and the quality
23 assurance procedures to quote accurate ratings and
24 protect consumers.

25 So, in large measure the regulations

1 we're putting together today are consumer
2 protection regulations. There's plenty of ways
3 people in the field could do ratings, and do
4 audits on their own. But we need to make sure
5 that the customers, consumers out there in the
6 field can trust them and know that what they're
7 getting has imprimatur of officialness behind it.

8 Some of the background documents. These
9 are just sort of -- my notes, I'm sorry -- phase
10 II fulfills the goals of Public Resources Code
11 section 25942; the first three there we just went
12 over. Also proposes a technique for determining
13 energy efficiency measure cost effectiveness.

14 This is essentially how we determine
15 whether or not a specific measure that's going to
16 be in a recommendation is cost effective or not,
17 and what sort of time period's cost effective.
18 That's one of the most difficult parts of doing
19 the analysis on how you make recommendations for a
20 home.

21 And also proposes a technique to develop
22 recommendations for energy efficiency
23 improvements, including cross-checking against
24 utility bills. That'll be discussed more in the
25 technical part of this presentation.

1 Some of our background documents that we
2 used developing this program -- this is sort of
3 the foundation upon which it was built -- was the
4 CEC report that was developed pursuant to AB-549;
5 its options for energy efficiency in existing
6 buildings. It basically lays out all the ways
7 that the existing building stock in the State of
8 California can be improved in a cost effective way
9 to make it far more efficient than it is right
10 now.

11 The phase I regulations of the HERS
12 program. We've already discussed the Title 24
13 energy efficiency standards, which have probably
14 one of the best models in the world possibly for
15 assessing energy use in a home. And we are using
16 that model from the Title 24 as the basis to
17 develop the model for this HERS program.

18 And RESNET's 2006 mortgage industry
19 national home energy rating system standard.
20 RESNET is a national organization that oversees
21 ratings across the country to some degree, and CEC
22 is sort of, to some degree, partnering with them,
23 but also more fulfilling their role in California.

24 But their standards for how you organize
25 providers and raters has been very influential in

1 developing this program.

2 The key purpose of this project is that
3 while the Energy Commission has been developing
4 some excellent standards for making new homes more
5 efficient, new homes are built at the rate of 120-
6 to 150,000 a year. But there are 12 million
7 existing homes already out there.

8 So if we are going to reduce our energy
9 consumption in the residential sector, we really
10 need to target the existing homes, because that's
11 where the large mass of the structures are. And
12 most of those, you know, many of those homes were
13 built before 1978 when there were no efficiency
14 standards.

15 Many of those homes will have no
16 insulation in the walls or the attics. Even many
17 homes built after 1978 are not up to current
18 standards for energy efficiency, because the
19 standards have been moving quite a bit since that
20 time.

21 And these energy efficiency improvements
22 that get recommended out of the ratings or audits,
23 they're not just good for the environment, but
24 they're good for the consumer. Most of them --
25 because they all are, by definition, cost

1 effective, so they'll save consumers money as well
2 as energy.

3 The topic report is the background
4 document that we've been researching, looking into
5 various aspects of home energy ratings. And that
6 report basically sets forth the framework or the
7 basis for our recommendations in the HERS
8 regulations and in the HERS technical manual.

9 The content of the HERS topic report,
10 which is available on the website, is the
11 appropriate structure of a rating scale, just
12 exactly how you put a score on a home that's
13 getting the rating. The modeling assumptions used
14 to estimate home energy use; that's essentially
15 how do you properly evaluate the energy use of the
16 home.

17 The means by which reliable
18 recommendations of energy efficiency improvements
19 could be made. How do you turn the analysis of
20 energy use in the home into recommendations. You
21 have to marry that energy use to cost
22 effectiveness analysis.

23 The appropriate role for providers,
24 raters, auditors and other entities delivering the
25 ratings. How do the providers regulate the

1 raters. How do the raters relate to the auditors.
2 How are consumers protected from conflict of
3 interests.

4 Those are the questions that we've been
5 trying to tackle. And the potential HERS provider
6 and rater accreditation and quality assurance
7 procedures. So how does the CEC approve the
8 providers and how do the providers approve the
9 raters.

10 And with that, if we have any public
11 comment on the opening remarks?

12 MS. LAM: I received three blue cards
13 and so these individuals indicated they wanted to
14 make public comments. And I don't know for which
15 items. John, and then Jeff Chapman --

16 MR. SPEAKER: Just if an issue comes up
17 throughout the day, I'll raise my hand --

18 MS. LAM: Okay, and then there's another
19 one, (inaudible).

20 So at this point we are open for public
21 comments regarding the items that we just
22 presented. So if you'd like to speak, come up to
23 the podium and, again, state your name and
24 organization. And if you have a card for the
25 court reporter, go ahead and --

1 MR. EASH: I don't. I'm John Eash, John
2 Eash Architect Energy Consultant. And I just had
3 one real quick question on what was presented.

4 Is there a expectation of an adoption
5 date at this point in time? Will there be
6 additional workshops, for instance? And what type
7 of plan does the Commission have for proceeding
8 with this?

9 I hadn't found that on the internet and
10 maybe I just missed it. That's all.

11 MR. PENNINGTON: So, if we deal with the
12 next steps at the beginning instead of the end
13 we're not going to have anything to say at the
14 end.

15 (Laughter.)

16 MR. SPEAKER: That could be good.

17 (Laughter.)

18 MR. PENNINGTON: That's true.

19 (Parties speaking simultaneously.)

20 MR. ELEY: The bottomline is that there
21 will be a rulemaking that will follow this; that
22 rulemaking will incorporate some other workshops.

23 MR. EASH: This will not start 45 days
24 from today?

25 MR. ELEY: No.

1 MR. EASH: That's all I --

2 MR. ELEY: This is not the rulemaking.

3 MR. EASH: Thank you.

4 MR. PENNINGTON: Sorry to be facetious,
5 but that was a good quick answer. We're intending
6 to have adoption of these regulations by the end
7 of this calendar year. And if anyone has kind of
8 watched rulemaking processes in the past at the
9 Commission, you can see that's moving along pretty
10 quick.

11 Probably a workshop in August; probably
12 a rulemaking starting in the fall.

13 Michael.

14 MR. BACHAND: If I might --

15 THE REPORTER: Can you come up to the
16 mike, please.

17 MR. BACHAND: I'm sorry. Mike Bachand,
18 CalCERTS, Inc., provider.

19 I just wanted to know, you said adoption
20 by the end of the year, then do we have a lag in
21 implementation time like we typically do with the
22 2008 standards?

23 MR. PENNINGTON: You know, we haven't
24 really tried to mull that through yet. There
25 definitely, it's logical to have some transition.

1 It's not clear on how much.

2 MR. BACHAND: Maybe when everybody can
3 get ready?

4 MR. PENNINGTON: Right. So we'll need
5 to think about that.

6 MR. BACHAND: Thank you.

7 MR. ELEY: If we could move on then to
8 the next slides. This section of the presentation
9 we're going to talk about the HERS reports, and of
10 the content, the layout of these reports.

11 This is kind of looking ahead and this
12 is what the homeowner would see when his home is
13 rated. And the information is a little sketchy,
14 but we're trying to be as specific as we can.

15 The next slide, please. There really
16 are -- there's probably four documents that would
17 be produced as a part of the rating process. The
18 first one is the rater certificate, or the rating
19 certificate. And this would be something that
20 would give the rating of the home. It would be
21 perhaps suitable for framing. It could be like
22 the EPA mileage rating thing.

23 The second part of the HERS reports
24 would be a list of recommended improvements. And
25 this would always come out. We would always have

1 a set of recommendations on how to improve the
2 rating score, or how to reduce operating costs for
3 the consumer. We envision this being on a
4 separate document from the certificate.

5 The third piece of information would be
6 an analysis of the projected and historic energy
7 consumption of the home. Now, this third part
8 won't always be possible, because there will be
9 some instances where utility bill data simply
10 won't be available. A new home, for instance; or
11 perhaps a home that was recently purchased, and
12 the previous owners aren't willing to share that
13 data for whatever reason.

14 There could be some cases where the data
15 won't be available, so that third one is really
16 kind of an optional report.

17 And the fourth, the fourth rating report
18 would be a rather technical document, probably
19 multiple pages. It would be similar to the CF1R
20 report that's used in compliance documentation.
21 And this would just basically be a detailed
22 summary of all the data and information that was
23 collected during the field inspections; and all of
24 the data that went into the model that produced
25 the rating report and the recommendations.

1 Everything down to window area and window U factor
2 and, you know, all of those details.

3 So that's not something that would be
4 displayed, probably, but it would be there.

5 Next slide, please. So we did kind of a
6 sample rating certificate so that you could see
7 the kinds of information that we envision.

8 Next slide, please. In a prominent
9 location we envision a display of the HERS index,
10 kind of on a thermometer-like bar. At the right
11 side of the bar where it's shaded green would be a
12 zero energy home. So a score of zero would be a
13 net zero energy home.

14 I guess if you had a really large PV
15 system you could be negative. But, the scale at
16 this point doesn't go negative. It just goes to
17 zero.

18 The 100 mark on this scale is a home
19 that's in minimum compliance with California
20 energy efficiency standards. This is where we
21 would expect newly constructed homes to land.

22 Homes that are more efficient than the
23 minimum energy standards would have a score below
24 100, maybe 80, maybe 90, something like that,
25 depending on how efficient they are.

1 The majority of existing homes would
2 have a score larger than 100 because they were
3 built before insulation levels were as stringent;
4 equipments probably not as efficient, and so
5 forth.

6 So that's a key part of the rating
7 scale. We envision it being displayed graphically
8 perhaps similar to what's shown here. This
9 graphic actually is from USDOE's program. And so
10 they -- and it's similar also with the RESNET HERS
11 index.

12 Next slide, please. The rating scale
13 will include all of the traditional energy uses
14 that have been considered in the Title 24
15 compliance process, heating, cooling and water
16 heating. But it will also include consideration
17 of lighting and appliances energy, and exterior
18 lighting, or at least that portion of exterior
19 lighting that's attached to the building. You
20 know, if there's a lighted tennis court that won't
21 be a part of the rating. But if it's -- the porch
22 light would, the light in the garage would, and so
23 forth.

24 The things that would not be included as
25 a part of the rating would be pools, spas, lighted

1 sports courts, well pumps, things that are clearly
2 outside of the building boundaries, the envelope
3 of the building.

4 So we'll be covering these things a
5 little bit more as we move through the day.

6 Next slide, please. For homes that have
7 photovoltaics or wind or any other kind of
8 renewable energy system, there would be two marks
9 on the scale. One for the home without the
10 renewable energy contributions, and another lower
11 score for the home with the renewable energy
12 contributions.

13 The reason we want to do this is so that
14 the efficiency of the home without the renewables
15 can be displayed and can be a factor in the
16 homeowner's decision to make improvements or to
17 buy the home, or whatever.

18 The Energy Commission's policy is to
19 achieve net zero for newly constructed homes by
20 2020. So, this will help us move there. Also
21 it's still the most cost effective things to
22 reduce the score are, for the most part, not going
23 to be the photovoltaic systems. It's going to be
24 more mundane things like attic insulation and
25 tuning the furnace and the air conditioner and

1 sealing the ducts and things of that nature.

2 So we don't want to -- we want the
3 program to emphasize these things that are more
4 cost effective. And it's always been the
5 Commission's policy to invest first in energy
6 efficiency; to achieve a home that's as efficient
7 as possible. And then once that's done, then
8 start adding the photovoltaics. So, the way we're
9 dealing with PVs and the rating program is
10 consistent, we believe, with that.

11 Next slide, please. There'd be a
12 portion of the energy label that would have site
13 information like the floor area of the home, the
14 number of bedrooms, the house type whether it's
15 townhouse, single family, apartment, and the
16 foundation type which would be basement, crawl
17 space, slab. Just basic information.

18 Next slide. Right below that we would
19 envision a very high level summary of the energy
20 efficiency features. This is not a detailed
21 report; it would just indicate the insulation
22 levels, the types of windows that the home has,
23 the type of heating system and the efficiency of
24 the equipment, the type of cooling system and the
25 efficiency of the equipment; same for the

1 ventilation system, water heating. And if there
2 were renewable energy systems, those would be
3 listed here, of course, as well.

4 Next slide. Another portion of the
5 rating certificate would include the estimated
6 energy impact of the home. Now, the rating scale
7 is just a number between zero and say 150 or 200.
8 But this section of the report would spell out the
9 electricity consumption broken down by end uses,
10 gas consumption again broken down by end uses,
11 operating costs, renewable energy production. And
12 it would also have an estimate of greenhouse gas
13 emissions, which are a legal requirement of the
14 ratings that we're looking at.

15 The next slide. Now, these estimates of
16 energy impact would use the standard occupancy
17 patterns for a home. In other words, they would
18 not take into account extended summer vacations or
19 a dozen teenage kids in the house or anything like
20 that that would obviously affect energy
21 consumption. It would be kind of based on typical
22 operating patterns.

23 It would not consider the historic
24 energy use of the home. And it would not be
25 adjusted to occupant patterns, as I mentioned. So

1 in summary, it would -- this follows the
2 philosophy of rating the home, not the occupants.
3 So, this part of the rating would be sort of
4 standardized for typical operating conditions,
5 typical thermostat settings, typical tv watching,
6 you know, all of those things.

7 The next slide, please. There would be
8 another place on the rating certificate that would
9 identify the HERS provider. It would also
10 identify the rater. It would have the date of the
11 rating and some sort of registration number for
12 the rating that could be tracked back through the
13 provider.

14 And this portion of the rating
15 certificate would also be a place where the HERS
16 provider could put their identification or logo.
17 If the rating were co-sponsored, say, by the local
18 utility company or some other co-sponsor, that
19 logo could be included here, as well.

20 So this is a little branding box on the
21 rating certificate, but it also has some key
22 information. For instance, the name of the rater,
23 the date of the rater, and registration number
24 that can be used to recover more information about
25 the rating, if need be.

1 Next slide. There are lots of other
2 programs besides the California Home Energy Rating
3 Program, you know. There's BuildItGreen,
4 LEEDforHomes, California GreenBuilder,
5 ComfortWise. And often a home that's rated may
6 also qualify for these programs.

7 So there's a place on the rating
8 certificate where this can be identified, as well.
9 So, for instance, this part of the rating might
10 say, well, this home also qualifies as an
11 EnergyStar home. Or this home also qualifies as a
12 GreenPoint rated home, whatever. So, this is just
13 a place where additional information could be
14 shared.

15 Now, many of these other programs are
16 broader in scope than the California Home Energy
17 Rating Program. They deal with water use,
18 transportation, solid waste, construction, waste
19 diversion, environmental quality and many other
20 impacts.

21 So if they do qualify for those programs
22 the only part that really overlaps with the
23 California Home Energy Rating Program would be the
24 energy conservation, and perhaps greenhouse gas
25 emissions portion of the rating.

1 And the Energy Commission intends to try
2 and coordinate with these other green rating
3 programs so that if you get your home rated, you
4 might automatically qualify for some of the
5 credits under their rating program. So that's
6 something we're going to have to pursue once this
7 rating system is established.

8 Next slide. And the last part of this,
9 of the rating certificate that I'm going to
10 explain is the section that could be called
11 caveats. Sort of, you know, when you look at the
12 EPA mileage ratings, your mileage may vary, this
13 rating was calculated based on, you know, the EPA
14 test track or whatever.

15 And there will be these kinds of
16 qualifiers there on this rating certificate. And
17 we haven't provided the exact language for these
18 qualifiers yet, but this will be -- this is where
19 it would go.

20 Next slide. The second rating report
21 that I'm going to talk about is an analysis of
22 energy consumption. And this would be -- we
23 anticipate this being a graphic representation of
24 energy consumption in the home, consisting
25 probably of three different graphs.

1 One graph would compare operating costs
2 in dollars. A second graph would compare
3 electricity use in kilowatt hours per year. And
4 the third graph would compare natural gas or
5 propane use in probably therms per year.

6 All three reports would show the
7 simulated energy use that was the basis of the
8 rating certificate, but it would also compare this
9 to the raw energy use for the home, and it would
10 also compare it to normalized energy use for the
11 home.

12 By normalized energy use what we mean is
13 that we would take the utility bills which might
14 be for an especially cold February or an
15 especially hot July and those data would be
16 normalized for the typical weather periods
17 represented on the Energy Commission's weather
18 files, the ones that were used for the rating.
19 This would give us a more comparable rating.

20 Next slide, please. Or comparison,
21 excuse me. So, the energy cost graph might look
22 like this where the blue bars represent the
23 simulated energy bills. The red bars represent
24 the normalized energy bills. And the yellow bars
25 might represent the raw energy bills.

1 There will be a lot more fluctuation in
2 the raw utility bills. The normalized bills will
3 be rather smooth.

4 Next slide, please. The electricity use
5 graph might look something like this. The bar
6 charts, the stacked bar charts show the components
7 of electricity use generated from the simulation
8 results. So we would be able to see how much of
9 that is cooling, lighting, major appliances or
10 other electricity.

11 And then the lines, the blue line --
12 next slide, please. The blue line would show the
13 normalized energy bills. So if that line were
14 higher than the bars, that would indicate that the
15 home is maybe thermostat settings are lower than
16 what was assumed, or what-have-you. If it's lower
17 than that line, it might mean that the home is not
18 used on weekends, or that there's long vacations
19 or what-have-you.

20 Next slide. Then the yellow line would
21 show the actual utility bills for a 12-month
22 period. Now, don't pay too much attention to the
23 spikiness of this bar. I just sort of made these
24 data up to illustrate the point here. I don't
25 expect it will be quite that spiky; hopefully it

1 won't be.

2 Next slide. There'd be a similar graph
3 showing gas consumption. Again, the bars would
4 break down the components of gas consumption
5 between heating, water heating and major
6 appliances. The major appliances in this case
7 would probably be just the gas dryer, the range
8 and the oven.

9 And we would -- you will see -- in this
10 case you would see a lot of seasonal variation for
11 space heating. Hopefully it would be very low in
12 the summer, and it would be greatest in the colder
13 months.

14 And the other components would likely be
15 more constant throughout the year. And you would
16 see similar patterns with electricity use, as
17 well.

18 Next slide. Now, the third report, HERS
19 report, I'll talk about here are the
20 recommendations report. This is kind of a key
21 part. And what we're recommending in the
22 technical manual, the HERS technical manual, is
23 that HERS systems have the capability of
24 generating recommendations using both the standard
25 approach and the custom approach.

1 The HERS systems would have to
2 accommodate both the standard and the custom
3 approach. However, the custom approach in any
4 given rating would be optional. You wouldn't, you
5 know, the rater doesn't have to do the custom
6 approach. But you always have to do the standard
7 approach.

8 The standard approach would use the
9 same, every rater would use the same costs; every
10 rater would use the same economic assumptions; and
11 every rater should produce the same
12 recommendations every time. So it'll be kind of a
13 standardized approach.

14 The custom approach, on the other hand,
15 would allow the rater to put in the homeowner's
16 bid to replace windows; you could put in your own
17 costs. You could put in other data that's unique
18 to the homeowner. And so the custom report would
19 be perhaps more meaningful to the homeowner, but
20 the standard approach would -- what we expect to
21 come out of the standard approach would be the,
22 sort of the no-brainer kinds of recommendations.
23 The things that, you know, if the home were on the
24 market not being occupied and someone were buying
25 it, these would be recommendations that you would

1 want to try and implement right away.

2 Next slide. So the recommendations
3 report would include a list of cost effective
4 recommendations. it would be a rank-ordered list,
5 so the recommendation at the top of the list would
6 be the one that's most cost effective and the one
7 that you should do first.

8 The one at the bottom of the list would
9 be the one that's still cost effective, but not as
10 cost effective as the one at the top of the list.
11 So if the homeowner wanted to not do everything,
12 they would try to lop off the ones at the bottom
13 first, and leave the ones at the top.

14 For each recommendation there would be
15 an estimated reduction in the energy bill
16 associated with that. And they would be
17 cumulative, so that the first one on the list
18 would have, say that'll save \$500 a year. And
19 then the next one on the list would be a second
20 one in combination with the first one, see. So
21 that would be say \$600 a year. The increment
22 would be the difference between the two.

23 And this way we'll be able to handle the
24 interactions between measures. The report
25 wouldn't be very useful if we saw each one in

1 isolation. That wouldn't make any sense.

2 And the recommendations report would
3 also indicate the expected reduction or
4 improvement in the HERS index associated with each
5 energy efficiency improvement.

6 So that's the content of the HERS
7 report. Let's move on to the next slide, please.

8 The optional approach, as I mentioned,
9 would allow the rater to customize inputs to fit
10 the particular behavior patterns of an occupant.
11 And this is pretty wide open. The raters -- we'll
12 talk about this much more in the afternoon and get
13 into the details of how this can be done.

14 But as an example, a custom set of
15 recommendations could take into account bids that
16 a homeowner has to make certain improvements. So
17 the homeowner could define the improvements they
18 want to make, and the report would then show the
19 cost effectiveness, the rank order and the
20 improvement in the HERS index associated with
21 those recommendations that the homeowner
22 identified.

23 The homeowner -- another approach that
24 could be taken with the custom approach is the
25 fixed budget approach. The homeowner can say

1 well, I've got \$10,000 to spend; give me the
2 package of measures that will save the most energy
3 for \$10,000. And it would produce a rank-ordered
4 list of measurements that would be within the
5 homeowner's budget.

6 Another possible approach is to say,
7 well, you know, I really want to have a score of
8 80. So, give me a list of measures that will get
9 me to an 80 at the least cost.

10 So the custom approach is pretty wide
11 open, and it can be wide open because we have the
12 standard approach sitting next to it, that's
13 mandatory for every rating.

14 Next slide, and I think we're ready for
15 public comments on this part of the agenda.

16 You have to come up here, John. You
17 can't speak from back there.

18 MR. EASH: This is my last comment, I
19 promise. I'm going to be leaving anyway at noon.

20 John Eash again. I think you've done a
21 marvelous job; I want to compliment you on what
22 you've done on this report. I think the whole
23 project is an excellent project.

24 I do have one concern. If I
25 misunderstood you, let me know. But it seemed to

1 me that you talked about a zero on one of the
2 scales that you're talking about being the best
3 score, zero energy use.

4 I understand the standards and how they
5 work, try to get to zero and so forth and so on.
6 But I don't go to a one-star movie rating; I go to
7 a five-star movie rating.

8 I got, one time I took a test and I had
9 a separate answer sheet. And it was a multiple
10 choice test, and I got off by one and I got a 14.
11 I got a 14 on the thing, and I didn't like that.
12 I would have preferred a 95.

13 And so I think that in the long run it
14 would be great if we could work it somehow to 100
15 percent green. That's what we're after, 100
16 percent green, echoed in negative numbers for bad
17 things. America likes more, not less.

18 That's my comment.

19 (Laughter.)

20 (Applause.)

21 MR. SCOTT: Yes, hi; I'm Robert Scott
22 with CHEERS, Executive Director. I had a couple
23 questions about the rating scale in terms of the
24 reference. Is that fixed 2008 Title 24, because
25 there's that question about stable over time, or

1 able to change?

2 MR. ELEY: The HERS technical manual
3 identifies 2008 standards as the reference. And
4 we're silent at the moment about whether it will
5 stay there always or not.

6 I think it's one of the things we would
7 like to get your input. I mean we could fix, we
8 leave it in 2008, or we could move it as the
9 standards change. There's pros and cons both
10 sides of that.

11 MR. SCOTT: Okay, because that's like
12 the next part which is what would be the longevity
13 of any rating that was there; how long would it be
14 good for; a couple other questions.

15 Also, we talked about the rating being
16 based on TDV energy. I know that there's certain
17 complications related to how that affects actual
18 site-based energy use. And since we're
19 essentially trying to use that for a rating score,
20 does -- I understand the TDV for rating score, but
21 the estimates for recommendations and the actual
22 energy consumption, is there something related to
23 a site-based energy consumption for that point?

24 MR. ELEY: Well, again this gets -- for
25 the recommendations, the recommendations that

1 surfaced from the standard approach would use TDV
2 energy savings and the net present value per unit
3 of TDV energy savings as the basis for coming up
4 with the recommendations.

5 But with the custom approach, the rater
6 would put in the utility bill that the homeowner
7 sees. And it would have the actual costs that the
8 homeowner sees.

9 So, again, it's the two; the standard
10 approach versus the custom approach.

11 MR. SCOTT: Okay. And then the last
12 part is about the calculations used in the
13 standard recommendations piece, the interest rate,
14 how would that be maintained for the standard in
15 terms of what is the discount rate be maintained?

16 MR. ELEY: Well, that's a good question.
17 We may want to defer that until this afternoon
18 when we get into the recommendations because -- if
19 you don't mind, Robert?

20 MR. SCOTT: Well, no, that's okay.

21 MR. ELEY: If you're still going to be
22 around. Because we'll be going into that in a lot
23 more detail at that time.

24 MR. SCOTT: Thank you.

25 MR. ELEY: Thanks. Come on up.

1 MS. LAM: Yeah, if you have questions
2 you need to come up to the podium to speak,
3 please.

4 MR. GOLDEN: My name's Matt Golden; I'm
5 with Sustainable Spaces; we're a home performance
6 contractor out of San Francisco.

7 And I wanted to clarify, to understand,
8 our business is around testing homes. We actually
9 do ratings, these sorts of things. But we're also
10 very focused on the actual execution of doing the
11 retrofit measures.

12 So very sensitive -- we understand the
13 need for verification and kind of, you know, in
14 terms of programmatical, but we're also very
15 sensitive to make sure that from a execution
16 standpoint that we can have -- make sure that our
17 service continuity. And we're very concerned
18 about having, I guess, third-party raters on the
19 front-end of our business in terms of slowing down
20 the actual implementation. We're just curious how
21 we're addressing that.

22 MR. ELEY: We're going to address the
23 role of building performance contractors which I
24 think Sustainable Space would qualify as. That's
25 later on the agenda. So maybe, Matt, hopefully

1 we'll address your comments at that time.

2 MR. NESBITT: George Nesbitt,
3 Environmental Design/Build, and also a Board
4 Member of CalHERS.

5 A couple things. In the seven years
6 I've been a new home and existing home rater I've
7 never had anyone ask me for a rating. What they
8 want is an audit. They want to know where their
9 energy dollars are going. Or they want to know
10 why they're uncomfortable or, you know, various
11 other problems.

12 So, nowhere do I see any definition
13 between a audit and a rating. The audits aren't
14 really audits and the ratings aren't audits,
15 either.

16 Ratings have value when it comes to
17 energy efficient mortgages and other programs.
18 They have less value, I think, to most of our
19 customers' needs.

20 The report could use more information, a
21 summary of the building shell, of wall areas, roof
22 areas, window areas, kind of upfront. And a few
23 other things rather than just the efficiency of
24 say the furnace, the efficiency of the whole
25 system. So, you know, that 90 percent furnace is

1 really only 50 percent when you account for the
2 duct leakage and other losses.

3 And I'm also a little worried that we
4 keep creating our own systems in California and
5 how this really relates to the rest of the
6 country. And compare it to the national scale.
7 If we're so better a house that would be an 80 to
8 the rest of the country should be what, a 60 here.
9 We'd look better. And I don't see anyone else
10 adopting our methodology as of yet.

11 And actually the scale you currently
12 have should be reversed. Zero should be on the
13 left, 100 should be on the right. And you're
14 right, Americans want more. So, although we want
15 to go to zero energy, actually we want to go to
16 positive energy. So we want to flip the other
17 side eventually.

18 Thank you.

19 MR. CONLON: Good morning. Tom Conlon
20 here with Energy Checkup, a service of Geopraxis.
21 And I want to underscore John Eash's comments
22 earlier that I'm really quite impressed with the
23 product of this report so far. I think it's come
24 a long way in the last couple of months now, in
25 particular.

1 And I'm especially impressed at the
2 separation of the standard from the custom
3 approach. I think that will actually help us
4 resolve two very important challenges here.

5 One is it will give the building
6 performance contractors and the other custom
7 service providers an opportunity to really
8 demonstrate the extra value of their services, and
9 to be able to price for that.

10 And at the same time I think it will
11 address the concerns of the real estate industry
12 that does not want to see too much burden passed
13 on to the home buyer and seller at the time of
14 sale.

15 And so I think that innovation here --
16 we may have to tweak it a little bit, but I think
17 it's a very good thing. So I'm very pleased with
18 that.

19 Particular to some of the things that
20 have been presented so far, the HERS report
21 deliverable, I would caution the Commission to not
22 over specify the format of that. I'd encourage us
23 to allow the providers and the software providers
24 to encourage creativity and meet the element, the
25 needs of disclosure and get the elements in front

1 of consumers. But let us present that in a way
2 that is going to be most palatable to the
3 particular consumers we might be trying to serve.

4 A lot of the research we've done
5 indicates that the consumer does not want too much
6 information. They're only going to read what they
7 can actually consume. And we have to be conscious
8 of that when we're trying to get our message
9 across.

10 In terms of the certificate, itself, the
11 terms -- there are two terms that I want to draw
12 attention to. Features and energy impact. In an
13 existing home context the features -- might be
14 easier to explain if the graphic were up on the
15 screen for the actual certificate.

16 But, there was a reference to the
17 insulation levels. And that's very know-able in a
18 new construction rating context, but it can be
19 very difficult to produce that with any kind of
20 reliability or accuracy in -- yeah, that previous
21 one is the one there I'm talking about -- to the
22 right the yellow area.

23 MR. ELEY: Keep going back till you get
24 one without the box. There you go.

25 MR. CONLON: Thank you. The ceiling

1 insulation, wall insulation obviously in an
2 existing home inspection those are going to be
3 noninvasive visual observations. So we might have
4 to find some way of making sure we don't make it
5 appear that the inspector knows that when perhaps
6 they're making their best judgment.

7 And then with respect to the energy
8 impact, you know, the term we use is estimate.
9 And we're very careful to be sure that we don't
10 ever over-promise the accuracy of the product of a
11 simulation.

12 And just one last comment before I sit
13 down and thank you for your tolerance here, it's a
14 more fundamental comment, has to do with the unit
15 of analysis and the choice, at this point, to
16 exclude ancillary loads like pumps. And what I
17 think I read was portable lighting, perhaps, in
18 the house might be excluded from the --

19 MR. ELEY: No. Portable lighting is in.

20 MR. CONLON: Okay. So, --

21 MR. ELEY: Everything inside the walls.

22 MR. CONLON: So the analysis is really
23 the box of the house, itself. And, in fact, a lot
24 of existing home consumers are looking for an
25 explanation for why their bill is so high. And

1 this is going to be particularly an issue for the
2 more custom providers who are trying to
3 troubleshoot, perhaps, maybe even a larger
4 property that has multiple out buildings.

5 And so the need to allow that kind of
6 analysis or make that portion part of the
7 ancillary analysis, custom analysis, some kind of
8 solution for that needs to be addressed, as well.
9 And I think we're on our way to that.

10 So I just wanted to make those points
11 and appreciate, again, the opportunity to do so.

12 MS. ASAN: Tenaya Asan from
13 BuildItGreen. I also want to commend you for all
14 the work that you've done on this. It's obviously
15 an immense amount of work and I think you've done
16 a great job so far.

17 I also want to commend you for including
18 the possibility of incorporating some of the green
19 programs out there. You certainly assist the
20 homeowner in their goals, as well as the state in
21 their goals.

22 And speaking about the state goals, I'm
23 hoping that you folks are coordinating with the
24 Climate Action Team and ARB in their production of
25 their AB-32 plan.

1 One consideration is I don't see
2 anything here on the initial report as a report
3 for improvements. So, if there is an improvement
4 on the house, greenhouse gas reduction in
5 particular, I think it would be helpful for the
6 state level. So I'd encourage you to do as much
7 coordination as you can.

8 The green building subcommittee for ARB
9 and Climate Action Team are meeting. They are
10 targeting existing homes particularly. And I'm
11 sure that they would love to have this type of
12 tool, and to know that this type of tool is being
13 incorporated.

14 MR. PENNINGTON: Thank you very much.

15 MS. THOMPSON: Hi, Debbie Thompson with
16 Capitol Energy Consultants. I was wondering if
17 you were going to do water usage at all. Water's
18 a main issue in California, as elsewhere. And it
19 would be something simple to put in there.

20 Also well pumps; that uses quite a bit
21 of energy. So I'm kind of curious why that's not
22 going to be part.

23 MS. SPEAKER: That's where the green
24 building program --

25 MR. ELEY: We've turned it over to these

1 guys at that point. Just focus on energy. And so
2 we're trying to do -- and I believe that's the
3 statute, as well.

4 MR. PENNINGTON: So we are intending to
5 address auxiliary energy, you know. We're taking
6 a little bit of a baby step here to get this
7 program in place with a look at how do we improve,
8 and trying to build in flexibility for the
9 improvement. And so we definitely -- the
10 auxiliary energy part of it kind of fits into the
11 anticipate how we want to improve.

12 So we can explain that a little bit
13 more this afternoon.

14 MS. THOMPSON: Okay.

15 MR. PENNINGTON: Your comment on water
16 is a good comment, and the Commission needs to be
17 more involved in the interaction between energy
18 and water. And so that's a well deserved comment.
19 We're probably not going to get that into this
20 first version of the program.

21 MS. THOMPSON: But if you think about
22 it --

23 MR. PENNINGTON: Yes.

24 MS. THOMPSON: -- there's so many things
25 a home can do to save water, and people just don't

1 realize it.

2 The other thing I was a little concerned
3 about, if you put in a higher efficiency furnace,
4 say, versus an 80 percent; and you put in a 95
5 percent, does the index go way up?

6 MR. ELEY: Well, the index would come
7 down.

8 MS. THOMPSON: I mean -- well --
9 (Laughter.)

10 MS. THOMPSON: -- come down, excuse me.
11 It would -- because I was concerned when somebody
12 wants to buy the cheapest thing possible because
13 they have \$10,000 to spend, are we going to be
14 able to show them the rating?

15 MR. ELEY: Yeah, if furnace replacement
16 were one of the measures in the recommendations
17 list, you would actually see how much energy, what
18 the reduction in energy use would be for the
19 addition of that measure.

20 MS. THOMPSON: Okay, thank you.

21 MR. DeSNOO: Neal DeSnoo with the City
22 of Berkeley. There's a lot of great applications
23 for this. One of which, I thought, would be
24 wonderful is we could collect the data on these
25 and do some analysis so we can find out what

1 measures we should be targeting.

2 This may take a little time to acquire,
3 but we don't really know what's going on in our
4 community in terms of the housing stock. Some of
5 this data, if it were available on a database
6 sorted by zip code or something, it would be
7 really valuable.

8 MS. LONDON: I'm Jody London; I'm
9 working with the County of Los Angeles. I'm a
10 consultant to them. And I want to amplify some of
11 the comments that have come in already.

12 In terms of the rating system I'm sure
13 you're aware that in the European Union they're
14 using an A-through-G system. And you might think
15 about that, because that's another -- I'm sure
16 you've looked at all these, but just throw that
17 one out there.

18 And then also the comments from the
19 person from BuildItGreen. I think that's really
20 important because the Climate Action Team is also
21 developing regulations for local governments and
22 how they're going to comply.

23 And I think that the local governments
24 are probably going to be really interested in
25 being able to capture the home energy savings for

1 their own compliance with AB-32. And the
2 utilities are also going to be trying to get those
3 savings credited to their programs.

4 So we need to really think about who's
5 going to get the credit when these programs come
6 down for the climate piece of it.

7 MR. JOHNSON: Hi, Scott Johnson,
8 Institute of Heating and Air Conditioning
9 industries. I don't know where to put this out so
10 I'm just going to throw this out here.

11 About the toggle, the custom toggle in
12 between the standard and the custom. We need this
13 tool. I mean we really need this tool to get
14 launched out as quick as possible.

15 But if we could possibly leave the
16 custom open as much as possible, as far as
17 architecture and the software, itself. I like the
18 idea, too, of allowing the providers the latitude
19 to go in and build a better product one way or
20 another.

21 And, you know, being in so many
22 different disciplines, you know, a home
23 performance contractors, the raters, and you know,
24 training up different industries, there's so many
25 different diagnostic tools on the horizon right

1 now that we're really going to be able to diagnose
2 exactly what's going on, you know; calculate R
3 values, you know, with infrared cameras that are
4 coming out.

5 I just think we really need to pay
6 attention as much as possible and leave that open-
7 ended. Especially like, you know, let's just
8 take, everybody know Rick Chitlett's (phonetic)
9 house, 3520 square foot house with a two-ton air
10 conditioner on it, and it works just fine. And it
11 really calculated out at 1.5 tons.

12 So, you know, having these parameters go
13 ahead and build a custom shell, and exactly what's
14 going on with that HVAC system, what's going on
15 with all of it.

16 Because I'm concerned, too, about these
17 performance contractors actually going out and
18 producing erratically improved product that's way
19 beyond the standards.

20 I mean if we're going in and we're
21 starting to set defaults on HVAC systems or shells
22 or that sort of thing, and then all of a sudden
23 that's going to rate the same as another house
24 that's absolutely performing astronomically.

25 So, anyway, maybe this is an incorrect

1 time to throw that out there, but I think
2 architecture of the tool is critical, but leaving
3 it open-ended. Thanks.

4 MS. LaPIERRE: Good morning; Alice
5 LaPierre with the City of Berkeley, also. Thank
6 you again for all your work on this; it looks
7 tremendous.

8 One of the considerations I hope you
9 will think about is some of the defaults. For
10 instance, I noticed in going through the document
11 that this certificate is in. There's no
12 provision, for instance, if a home has no
13 dishwasher. Not every home has a dishwasher.
14 That would be a load that -- I wouldn't want to
15 see a home penalized for not having an appliance
16 or not having air conditioning or not having
17 something where they're assigned a load. So if
18 there's a way to keep that in the customer part
19 in, that would be great. Thank you.

20 MR. CISNEROS: Bruce Cisneros with SMUD.
21 And I wanted to comment about a couple things
22 regarding the scale. I like a lot of the aspects
23 of the scale where zero is zero energy. It's
24 aligned with the long-term goal for the state. It
25 shows that a lower score means less energy.

1 That's aligned. It has numerous other advantages.

2 I, too, am also concerned with how
3 intuitive that will be for people to grasp because
4 of what they're used to seeing. A bigger score
5 means better.

6 And so I know that the resident system
7 flipped this in 2006. And I'm wondering is there
8 market research that they used to show that this
9 would be easy for people to grasp, and there would
10 be a minimum of having to reorient their gauges to
11 understand what a low score meant versus a high
12 score. Or has any market research been done as
13 part of this project so far, you intend to do
14 some, to insure that there will be a minimum of
15 confusion if we go to this kind of a score.

16 I assume the CHEERS system is still
17 using high is better. And so we also have a
18 conflict there, having to readapt. But really
19 what we want is something that in the long term,
20 you know, five, ten years from now, we are
21 comfortable that we went with the right score that
22 has the best recognition and understanding by
23 people.

24 They have to get it quickly, too. You
25 can't sit there and have to explain it to them.

1 So, that's my first quick question. Is there
2 market research that you've been working on to
3 know this is going to work?

4 MR. ELEY: I think one of the reasons we
5 shifted to this scale is to be consistent with the
6 national resident standard. And, you know, we
7 felt that it would be confusing if the HERS index
8 meant something different in California than the
9 rest of the country.

10 I don't know of any market research yet
11 that RESNET's done, Bruce. I do know that the
12 people within their company who market the REMRATE
13 program, they're telling us that consumers and
14 raters are getting it, though. That they are
15 understanding this reversal of the scales. And it
16 is working.

17 One of the things that RESNET and
18 REMRATE do, though, is they -- you can translate
19 this scale to stars, for instance. You could have
20 stars in addition to the scale. And to get five
21 stars you'd have to have a 50 or something, you
22 know. And one star you're at 120, I don't know.
23 I don't remember exactly where the thresholds
24 were.

25 But there probably are some things that

1 we could look at that would comply with the more-
2 is-better mentality of the U.S. consumer. And
3 also stick with the consistency, maintain the
4 consistency with the resident national standards.
5 So we'll look at that.

6 MR. CISNEROS: Maybe for the next report
7 or workshop you can gather some additional
8 information, hopefully more than anecdotal, from
9 their experience with RESNET and how that is
10 working to give us a better sense of comfort here
11 in California if we go this way.

12 The other question I had has to do with
13 the limits of the scale. I understand that the
14 scale goes to 250. I know you grabbed a graphic
15 from the website, but it only goes to 150.

16 However, there is a problem. If you
17 actually made the scale zero to 250, it's going to
18 squeeze zero to 100 down very small. And the
19 difference between a 90, a 95 or 100 will look
20 insignificant.

21 So I wonder if you've conceptualized how
22 you deal with that, you know, balancing of do you
23 want to show the whole scale and where the worst
24 houses are. I'm sure there'll be houses well
25 beyond 250, too. If you look at houses well above

1 your cap of 2500 square feet, you know, 5000
2 square foot house that's very inefficient is
3 probably going to be like a 400.

4 So you may need to accommodate that
5 situation, too. And I would recommend that you
6 keep it small, maybe zero to 150, which will
7 probably accommodate 75 percent of the homes out
8 there. And if anyone is off that scale, we need
9 to know, I'm off the scale, wow, that's bad.
10 Maybe you have a place for the number over there,
11 you know, put it numerically; show them off the
12 scale, and don't worry about making your paper
13 wider. Just, you know, that alone is message
14 enough.

15 (Laughter.)

16 MR. CISNEROS: So just a suggestion
17 there.

18 MR. ELEY: I think we also heard Mike
19 mention that we shouldn't be too specific about
20 the actual format of this. And I think that's
21 their intent, not to try and kind of lay it out,
22 but also leave some flexibility for the HERS
23 providers to employ their own graphic designs.
24 Might be a little better.

25 MR. BACHAND: Mike Bachand, CalCERTS. I

1 wanted to -- we don't know if this is the right
2 place, but everybody's talking about it -- I
3 wanted to throw my two cents in on the standard
4 versus custom.

5 We're looking at continuity over a long
6 time period very possibly on these ratings, so if
7 I heard you right the standard would be a
8 mandatory component of and included with a custom
9 so that there can be a standard bar measuring.

10 The custom one allows a lot of
11 flexibility, --

12 MR. ELEY: The custom is optional. The
13 standard is required.

14 MR. BACHAND: Right, so I'm suggesting
15 that a standard should be run -- when you do a
16 custom that a standard should be run so that the
17 Energy Commission and other people can get
18 standardized data that's not congested by
19 whatever, you know, homeowner usage or whatever
20 the homeowner picked. They might not have picked
21 the most energy efficient thing to do. They might
22 have picked something that they want, which is new
23 windows instead of better insulation, but they
24 like, they want, you know, whatever.

25 So, I'm just saying that maybe that

1 standardized component should remain a measuring
2 stick, even though the custom process is
3 developed.

4 MS. WRIGHT: Lois Wright with SMUD.
5 I've been working with a lot of the local
6 governments and encouraging green buildings, as a
7 whole.

8 The pattern tends to be that local
9 governments are looking at the entire
10 sustainability development agenda, of which this
11 is one part, is energy. And I recognize that
12 RESNET is a national standard in energy, but LEED
13 also is being used nationwide. And that's a point
14 system where higher is better.

15 And so I think you really have a dilemma
16 going here, because a lot of the total green
17 building systems and rating systems are looking at
18 point systems where higher is better.

19 So, to have them side by side, and have
20 your energy rating, you know, wanting to be down
21 and your green building or whatever other LEED
22 rating high, I think is going to be difficult for
23 the consumer to understand.

24 MS. MCCOLLOM: I'm Elizabeth McCollom
25 with Heschong Mahone Group. I just wanted to add

1 to that earlier comment and question, the
2 inclusion of appliances in the calculation for
3 standard. Maybe that could be included in the
4 custom, but, you know, people are going to use
5 this for the sale of homes, you know, to market
6 their home. And a lot of times they take the
7 appliances with them, and it's no longer a piece
8 of that whole building analysis.

9 Additionally, new construction. For
10 comparing this to a new construction 2008 standard
11 building, appliances aren't included in that
12 calculation. So if we're going to use that as the
13 standard maybe we should use the same inclusion of
14 measures, as well.

15 MR. PENNINGTON: We're going to get into
16 more detail about that later; hopefully it will be
17 more clear.

18 MR. ELEY: Most of the appliance use
19 actually is the same for the reference building
20 and the rated house, so there's no credit for it.

21 MS. MCCOLLOM: Okay.

22 MR. ELEY: We'll get to that this
23 afternoon.

24 MR. MAEDA: Excuse me. I wanted to add
25 one thing about rating scales. Bruce Maeda,

1 Energy Commission Staff.

2 Previously, a long time ago when we had
3 similar hearings on this item, we were looking at
4 a different rating scale, and there were other
5 issues that came up when you did the rating scale
6 in the opposite direction.

7 And I want to point out there's problems
8 no matter which way you use the rating scale.
9 There are special problems in terms of at the low
10 end of the scale, you either had to compress the
11 scale a great deal to accommodate very energy-
12 consuming houses, or you had to change the slope
13 of the scale, or something along that line.

14 So, there are issues no matter which way
15 you go on this.

16 MS. LAM: Thank you, Bruce. I think at
17 this time we're going to move on to the next
18 presentation on entities.

19 MR. SUYEYASU: I'm going to be
20 discussing the various entities that are doing the
21 rating process, the auditing. We are going to get
22 into building performance contractors as the next
23 discussion, but they may be touched on just
24 tangentially here.

25 If you have any -- this kind of gets a

1 little complicated through this process, so if you
2 have any just clarification questions that you
3 want to ask as we're going on, please, I guess,
4 come up and ask those to the microphone. But hold
5 your sort of general questions until the end, if
6 possible.

7 Producing a rating for a home we have
8 broken down into something approximately a seven-
9 step process here. First off, when the rater
10 decides to rate a home, they need to do a site
11 inspection where they look at the existing
12 conditions of the building. For new homes this
13 can be done in part looking at the plans for the
14 building.

15 Second, the rater will do an energy
16 analysis of the building where they took the
17 inputs from their site inspection, put them into
18 the model and run the model and see what the model
19 predicts for energy use.

20 Third, they will identify a potential
21 energy efficiency improvements on the home. This
22 will be an automatic part of the model that is
23 developed for this so that the program will run
24 through the energy uses; compare it for various
25 pieces of equipment; compare a database on the

1 cost for fixing those components of the home. And
2 make recommendations for improvements.

3 That runs into, i guess, point number
4 four, which is evaluating the cost effectiveness
5 of each improvement.

6 Number five is once you have those cost
7 effectiveness of each improvement, you will then
8 make a tiered list of recommendations to the
9 homeowner. This is the most cost effective thing
10 you can do -- the second most cost effective thing
11 you can do. And it will produce a list. You
12 know, if it's an extremely efficient home, it
13 might have one or two things on it. If it's a
14 really inefficient home, the list of cost
15 effective measures could be 15 or 20 things long
16 that could be done.

17 Number six is that you then designate a
18 rating for the home based on the energy use of the
19 home and comparing it to the reference home, home
20 built to the 2008 standard.

21 And finally, the rating process produces
22 the label that Charles just shared with you, which
23 is then given to the consumer, along with a report
24 with the recommendations and energy analysis.

25 There are a couple of different types of

1 energy rating activities. We think of ratings in
2 general, but it can be broken down into a few
3 different components.

4 The field verification in Title 24
5 compliance. The type of ratings that are already
6 going on right now under the CEC's auspices, and
7 therefore insuring compliance with Title 24. And
8 that is largely unchanged under these regulations,
9 although there are a few variations.

10 Whole house home energy ratings, and
11 that's mostly what we are speaking of today, where
12 you go into a home and you produce the standard
13 recommendations, possibly custom recommendations,
14 and give a score for the home.

15 Home energy audits that assess the
16 energy efficiency of a house and offer recommended
17 improvements. We see a home energy audit as
18 essentially being the first five steps of that
19 seven-step process, just before you actually
20 develop the rating.

21 And there are some companies in the
22 state who are in the business of doing audits.
23 And for various reasons they may not want to
24 produce a rating for a house. The homeowner may
25 not want a rating, and that process just gets cut

1 off at number five. But they are still regulated
2 under these regulations as home energy auditors.

3 And, finally, building performance
4 contracting, which will be mostly discussed in the
5 next section after we have public comment.

6 This whole process is overseen by
7 organizations known as HERS providers. There's
8 only three HERS providers in the state, CHEERS,
9 CalCERTS and CBPCA. The CEC relies on these HERS
10 providers to train, regulate, test, provide
11 quality assurance for the raters who are out in
12 the field doing the work.

13 The HERS providers, because they are
14 providing a slightly regulatory role on behalf of
15 the Energy Commission, need to maintain an arm's
16 length relationship with the raters who are in the
17 field. So they cannot employ the raters. The
18 raters cannot be business partners with the
19 providers. That's slightly distinct in how it
20 operates in some other states.

21 Under our regulations, as they exist
22 now, each provider needs to establish specific
23 quality assurance personnel who are overseeing the
24 process that the raters are doing, making sure
25 everything is complying as it should with the

1 regulations. That's probably one of the most
2 important roles of the provider.

3 Next slide. Providers, under these new
4 standards, will be able to issue five different
5 types of certifications for raters or associated
6 with raters.

7 The first one is the California whole
8 house home energy rater, as just discussed. The
9 second one is the California home energy auditor.
10 You actually will need to get a certification to
11 be an auditor before you can be approved by a
12 provider to be a rater, because those are
13 essentially the same function. There's not much
14 difference in terms of the training that will be
15 required to be a rater or to be an auditor.

16 You will also be able to get a
17 certification to be a California home energy
18 inspector. That will be discussed a little bit
19 more later, but this is similarly targeted at the
20 home inspectors who are already doing inspections
21 of homes at time of home sale. So that they can
22 help raters do ratings in large quantity. And
23 they will do the site inspection, data-collection
24 process, and use a rater to help produce the
25 rating score.

1 Home energy analyst, which we'll discuss
2 a little bit more later. And California field
3 verification and diagnostic testing raters. Those
4 are the Title 24 compliance specialists.

5 The primary rating certification type is
6 a California whole-house home-energy rater. They
7 are sort of the backbone of this process to some
8 degree. And those raters will be trained for both
9 the data-collection process and to do the analysis
10 in the model to produce the recommendations and
11 the rating.

12 The raters will be certified and have
13 the authority to oversee inspectors, the home
14 energy inspectors and the home energy analysts, as
15 necessary, so that they can, to some degree,
16 expand their scope of services to reach a broader
17 audience using some of the home inspectors who are
18 already out there in the field.

19 They would be overseeing home energy
20 analysts. We'll discuss home energy analysts a
21 little bit later, but we see home energy analysts
22 as somebody who's certified to do ratings for a
23 home based on plans, alone. They do not need to
24 know how to do the site inspections, but they know
25 how to run the model, they know how to read

1 blueprints. Very similar to people who are doing
2 Title 24 compliance documentation already.

3 But they would be overseen by a rater,
4 because the rater would need to assist them with
5 an onsite inspections that are required to do that
6 rating.

7 And finally, the whole-house home-energy
8 raters, they are not certified for five field
9 verification ratings. You need a separate
10 certification to do that. There's a lot of
11 overlap in the training between the two, so it
12 probably won't be that hard to get folks
13 certification. But as a certification matter, you
14 need a separate certification to do field
15 verification.

16 Okay, next slide. The California home
17 energy auditors is as discussed, essentially
18 baseline for getting a certification as a rater.
19 They first need to be trained in the auditing
20 process, which takes you through the first five
21 steps of producing a rating.

22 Those first five steps are, by far, the
23 most complicated steps of doing a rating. So this
24 is baseline certification that you need to get the
25 rater certification.

1 The certification entails training and a
2 few key points. Gathering data at the site
3 required for producing either a California whole-
4 house home-energy rating, or a California home
5 energy audit. Evaluation of all the energy-
6 consuming features of the home. Estimating the
7 energy consumption of the home based on the model.
8 And completing both the standard and custom
9 recommendation reports.

10 So, anybody who is trained as a rater or
11 as an auditor will have the ability to do both the
12 custom and the standard approach.

13 Then once you have the auditor
14 certification you need to work with the provider
15 to get that separate rater certification.

16 California home energy inspectors. As
17 discussed, this is something Tom Conlon's program
18 does a little bit already. It's using energy home
19 inspectors who are already out evaluating the
20 structural and other issues of the home at time of
21 home sale to do some of the data inputs for
22 producing ratings.

23 And, you know, part of this program is
24 trying to get as much market saturation as
25 possible. Pretty much everybody, when they buy a

1 house, are going to hire a home inspector. If we
2 can make it easy, a good way to use those home
3 inspectors to help produce home energy ratings,
4 we're going to reach a much broader audience. And
5 that is what this certification is targeted at.

6 The home energy inspector may collect
7 data for the home, on the condition of the home
8 and the energy-related features. But then they
9 need to partner with a whole-house home-energy
10 rater who will do the analysis.

11 They will not be qualified to do what
12 are known as field verification and diagnostic
13 testing procedures. Those are outlined for Title
14 24 compliance certification. Those are slightly
15 more complicated building analysis procedures.

16 And we want to keep the training process
17 for these home inspectors relatively simple. So
18 we are not going to certify them in those types of
19 inspections. They will be able to measure the
20 floor area of the building, the size of the
21 windows, the type of insulation that's present.
22 But they won't be able to get into a few of the
23 more complicated diagnostic testing procedures.

24 If you want to go to that level of
25 rating you would need to bring in a whole-house

1 home-energy rater. And obviously they won't be
2 certified to do the actual analysis on the
3 computer of the modeling.

4 On the flip side of them, sort of the
5 mirror image, are the California home-energy
6 analysts who can just do the modeling component,
7 but cannot do the site inspection of a home. They
8 will model the energy usage of the home; they'll
9 produce the rating report and the rating
10 certificate.

11 They'll develop recommendations, based
12 both on the standard approach and, if desired, the
13 custom recommendations. That will be a little
14 less likely since we see them mostly working on
15 new construction and there's not as much room for
16 a custom analysis in that context, but it's
17 possible.

18 When they produce a recommendation and
19 the rating report, they will need to partner with
20 a California whole-house home-energy rater who
21 will need to actually go to the site and do a
22 walk-through of the building once it's constructed
23 just to make sure it complies with the
24 documentation that the rating was based on.

25 MS. LONDON: Could I ask a clarifying

1 question?

2 MR. SUYEYASU: Yeah.

3 MS. LONDON: Jody London. Are there
4 different levels of education associated with
5 these different jobs or something? Is there a
6 reason why there are so many of these
7 classifications?

8 MR. SUYEYASU: There are different -- if
9 you look in the regulations it sets forth about a
10 dozen different points that the different
11 certifications need to be trained on.

12 We are trying to make it easy for some
13 people to do -- because obviously it's a
14 significant amount of training to be trained on
15 the whole process. But you can break it down into
16 some components. There are certain people who
17 might just want to get quick training on a small
18 subcomponent so they can do it without having to
19 go through the entire certification process.

20 The home energy inspectors are a key
21 target here, and that's why we are -- we're
22 thinking maybe, I don't know yet if I can speak to
23 that, but maybe two days of training to get them
24 up to speed to be able to produce the data for the
25 rating.

1 Whereas if you want to become a full
2 rater, it's a much more significant process. And
3 we don't want to make that a market barrier to
4 having home inspectors help us out here.

5 MR. PENNINGTON: So maybe another
6 comment.

7 MR. SUYEYASU: Yeah.

8 MR. PENNINGTON: To a large extent these
9 various people that are identified in this system
10 already exist in the marketplace and provide
11 services already. And have developed a specialty
12 in providing their portion of this whole picture.

13 And we wanted to be inclusive in a
14 program that we set up for California and provide
15 a place for the various roles that are already
16 being found useful in the marketplace and build
17 that into a system. But have the whole system
18 make sense and hang together and have proper
19 oversight and lead to the completion of, you know,
20 a full energy audit or rating. That's the idea.

21 So, this was a question of clarification
22 within --

23 MS. ASAN: I've got a clarification --

24 MR. PENNINGTON: Okay.

25 MR. SUYEYASU: Okay.

1 MR. PENNINGTON: Come up.

2 MS. ASAN: I'm not clear the difference
3 between the rater and the auditor. It sounds like
4 you're saying the rater cannot do the diagnostic
5 and testing. So that sounds like the inspector.
6 It's not clear to me those two roles, if you could
7 clarify that.

8 MR. SUYEYASU: I guess what I should
9 clarify here is we refer to field verification and
10 diagnostic testing procedures in two different
11 contexts.

12 One is for certifying compliance with
13 Title 24 energy features in your house. There are
14 also certain -- those same features such as duct
15 leakage, that's required for that process. That
16 is also something that a rater will do when
17 they're inspecting a home to produce a rating.

18 And we -- maybe it's shorthand, maybe we
19 should look -- think of it differently -- but we
20 also call those field verification diagnostic
21 testing procedures. So, a whole house energy
22 rater will do that in a house to produce a very
23 advanced rating.

24 If you use a home energy inspector to do
25 the data collection they wouldn't do that type of

1 analysis. And the model would just use
2 assumptions.

3 MS. ASAN: Okay, then who's the auditor?

4 MR. SUYEYASU: Okay, so who's the
5 auditor in the process?

6 MS. ASAN: (inaudible).

7 MR. SUYEYASU: Okay, a rater and
8 auditor. There is very little difference. A
9 rater is certified as an auditor, but I think
10 we're leaving it open to the potential that there
11 are people in California who see themselves as
12 auditors. For whatever reason, they don't have an
13 interested in becoming a rater, so they're just
14 going to get the auditor certification without
15 going the small extra step to get the rater
16 certification. Do you have more explanation of
17 that?

18 MR. PENNINGTON: Well, as we said
19 earlier, we see this as part of the same
20 continuum. And we see the auditor activity doing
21 most of the same work that a rater would do, but
22 for some reason there's not a desire to have a
23 designation of a rating.

24 Our statute requires us to address
25 getting, you know, reasonable utility bill

1 estimates, reasonable recommendations for
2 improvements which are sort of the mainstay of the
3 auditor, as well as a rater.

4 So, it's possible this is a transitional
5 difference, that once we actually get the program
6 in place it will be natural for someone who's
7 doing an energy audit to also learn the final two
8 steps, which are fairly straightforward in
9 designating a rating.

10 But at the outset we don't want to be
11 confused that there's a whole big part of the
12 rating process that somehow is a different thing
13 and not part of this system. So we're trying to
14 be inclusive here related to the energy audit at
15 this point.

16 MR. SUEYASU: Mike, do you --

17 MR. BACHAND: Just a point of
18 clarification.

19 MR. SUEYASU: Okay.

20 MR. BACHAND: Mike Bachand, CalCERTS.
21 You said right at the very last sentence that you
22 said when a home energy analyst does a rating from
23 a set of plans, that someone would do a walk-
24 through after the home's constructed.

25 MR. SUEYASU: Yes.

1 MR. BACHAND: That made me wonder if I'm
2 in the right workshop. Are we talking about
3 existing homes? I didn't understand that.

4 And I could have drawings on a house
5 that exists, certainly, --

6 MR. ELEY: They would be new homes --

7 MR. SUYEYASU: It was in the context of
8 new homes.

9 MR. BACHAND: So, --

10 MR. PENNINGTON: We'll be doing ratings
11 for newly constructed homes, right?

12 MR. BACHAND: Yes.

13 MR. PENNINGTON: As well as existing
14 homes.

15 MR. BACHAND: Okay.

16 MR. PENNINGTON: So we need the whole
17 system. I'm not sure what your question is.

18 MR. BACHAND: Okay, so I didn't
19 understand that a new home construction could fall
20 under this kind of a rating, --

21 MR. ELEY: Yeah.

22 MR. BACHAND: -- so, okay. Thanks.

23 MR. MAEDA: Bruce Maeda, Energy
24 Commission Staff. I wanted to add on something.
25 We're also possibly envisioning that an auditor

1 may, in the future, be concentrating on behavioral
2 and psychological aspects in the energy
3 consumption, be starting to rate the occupants
4 more heavily. And have additional training in
5 that area. But we haven't outlined that yet.

6 MR. CHAPMAN: Jeff Chapman with
7 California Living and Energy. Bill, a rater has
8 to be an auditor first, am I accurate? A whole
9 house rater has to be trained as an auditor?

10 MR. PENNINGTON: Yes.

11 MR. CHAPMAN: But an auditor doesn't
12 have to be a rater, right?

13 MR. PENNINGTON: Right.

14 MR. CHAPMAN: Okay, that clarifies it.
15 We've been talking about existing homes, and per
16 your comments and all your comments, what is the
17 focus of this in new construction beyond the Title
18 24, beyond the existing HERS rating for new
19 construction Title 24, how will this program work
20 precisely in new construction where there hasn't
21 been electricity use, there hasn't been natural
22 gas use, owners get the key, they walk in the
23 door. What's the thought behind that?

24 MR. ELEY: Well, Jeff, the home can be
25 rated. You get the rating certificate. You

1 obviously can't do a utility bill analysis,
2 though.

3 MR. CHAPMAN: Sure.

4 MR. ELEY: That's why when we got --
5 when we were talking about the utility bill
6 analysis we said, well, you can only do that if
7 the utility bill data is available. And it
8 wouldn't be in the case of a new home.

9 And also presumably, if a new home is
10 built in compliance with the California energy
11 efficiency standards, we would expect that the
12 list of recommendations following the standard
13 approach would be pretty close to zero.

14 (Laughter.)

15 MR. CHAPMAN: I'll pass on that.

16 (Parties speaking simultaneously.)

17 MR. CHAPMAN: Okay. Well, thank you.

18 (Laughter.)

19 MR. SUYEYASU: Let me just get through
20 this one last slide, and I think we'll just open
21 it up to public comment, because there's just one
22 more to go.

23 The last slide was just discussing the
24 traditional California field verification and
25 diagnosing testing raters. And that remains

1 largely unchanged from where it was before.

2 And just to be clear that those field
3 verification and diagnosing testing raters will
4 have no role in terms of data collection or
5 modeling in relation to doing the rating, mostly
6 discussing about today, in terms of providing a
7 score and recommendations for energy improvements
8 in a house. So it's a very distinct aspect of
9 this program.

10 And with that, Matt, did you have a
11 question? Clarification or otherwise.

12 MR. GOLDEN: So I guess where my
13 question was coming from has to do -- this is Matt
14 Golden -- has to do, I guess, more from a
15 marketing standpoint, and from -- not that these
16 designations don't maybe need to exist within the
17 program, but how do we expect homeowners to
18 understand what they're getting.

19 We look at one of our biggest, like
20 industry business risks actually is people having
21 dilution of message and not really understanding
22 the differentiation between home energy rater or
23 green point rater and building performance
24 contractor. We all just kind of get lumped into a
25 big pool. So I'd just be curious how we want to

1 address that.

2 So I don't know if there's any answers,
3 but at least maybe I'll make a statement. I think
4 we should address that.

5 MR. ELEY: Well, this is just one quick
6 question, Matt. We're not trying to set up
7 marketing guidelines here. The distinctions that
8 we're setting up are more regulatory --

9 MR. GOLDEN: Right.

10 MR. ELEY: -- distinctions. And I
11 suspect that, you know, when this program is being
12 promoted in the market that the messages may
13 change a little bit. But hopefully that can be
14 done within the context of the regulatory
15 framework that we've established, or are trying to
16 establish.

17 MR. GOLDEN: I just think it's worth,
18 you know, because we all want adoption, just
19 making sure that like when we look at it, and this
20 is from our business perspective, there's a lot of
21 people that are this kind of auditor, this kind of
22 rater, this one being called a diagnostician.

23 And it's very hard for people to
24 understand what they're getting and differentiate.
25 So, I don't know, I think there needs to be some

1 thought paid to that, because we get a flood of
2 people on the market. Homeowners don't know where
3 to turn and they don't know the difference, so
4 they don't know what they want, or who the right
5 person is. Do they want a rater specialist to
6 build a performance contract, or how do they
7 determine who they want to talk to.

8 We can't really assume the market's
9 going to -- we're going to necessarily sort it
10 out.

11 MR. MIR: Just to address that comment,
12 Rashid Mir with the Energy Commission. When the
13 homeowner, they're going to need to get a HERS
14 index, so they're not going to be hiring the
15 energy inspector, themselves, or an energy
16 analyst. Those groups cannot market themselves
17 by, you know, they're partnering with a whole-
18 house energy rater.

19 But how do you actually get that index?
20 There's different ways of doing it. One person
21 can do it by themselves, or there could be two or
22 three people partnering together and doing that.

23 So, those distinctions are there, but
24 those are probably not what's going to be marketed
25 to the customer.

1 MR. NESBITT: George Nesbitt, speaking
2 from a standpoint of CalHERS. We're a new
3 membership organization in California to represent
4 those regulated under these proposed regulations
5 with the exception of the providers. Since, by
6 the regulation, we are separate from them.

7 I'm a licensed general contractor, a
8 building performance contractor, but then became a
9 HERS rater for both new construction and then
10 existing homes; a CHEERS energy analyst; and then
11 a CBPCA building performance contractor. And now
12 I have my CABEC CPE and went through CHEERS' new
13 existing home class again.

14 As well as I need to get a NAT
15 (phonetic) and BPI. And god knows what -- oh,
16 yes, I'm sorry, I forgot the green point rater.
17 Not to mention we'll be having green point rater
18 for existing home. And the list goes on and on
19 and on.

20 There are too many things here, and some
21 of the distinctions are very unclear. I mean I've
22 read through it. Actually home energy auditor has
23 not been defined anywhere in the documentation
24 that I have found yet. And I'm also very worried
25 about the customer being able to differentiate.

1 And, of course, so we have six
2 designations here, including the building
3 performance contractor. But, of course, even
4 under the field verification and diagnostic
5 testing rater, we have, you know, we have a core
6 and then at least four additional things on that.

7 There's really only three things we're
8 talking about here that you can do to the house.
9 The most basic is the checklist inspection. Okay.
10 Then I would say the next level up is actually the
11 HERS rating, the scoring of a house. And then, to
12 me, the top level is the energy audit.

13 And the difference between a rating and
14 an audit is a rating is theoretical, Title 24
15 code, energy code, is theoretical. Well, you're,
16 you know, this building will use this much and you
17 either comply or you don't.

18 The energy audit is based on the actual
19 use, which includes everything. When you buy a
20 house, you buy the house, you buy the dirt it was
21 built on, you buy the pool that's the hole in the
22 ground, and the sheds and everything else that's
23 there. So I see really an audit as the highest
24 level.

25 Now, who does it, you know, is a

1 different thing. Who does what. So, that's --
2 let me see, yeah, so, you know, and will the
3 average homeowner. I mean I've been struggling
4 reading through everything trying to figure this
5 out, and the hierarchy and the connections between
6 who can do what and you know, you can work under
7 them. I don't know, you know, why would I want to
8 have someone work under me unless they're not
9 directly under me and all that.

10 But will the homeowner, will they be
11 able to tell the difference? And I do say there
12 is growing recognition from homeowners that they
13 need to call someone to figure their house out.
14 They've called the window guy; they sold them
15 windows. Didn't solve their problem. They called
16 out HVAC companies that are experts, and they tell
17 them, well, there's nothing you can do, you know.

18 So they do kind of recognize they need
19 someone to come and figure it out. They're not
20 used to paying for it yet.

21 So, I'll leave it at that right now.

22 MR. CHAPMAN: Just a real quick comment.
23 I think our colleague's comments were well
24 intended and very pointed. Any time a person does
25 anything -- let's deal with an existing home and

1 the homeowner. Use the illustration of applying
2 windows that didn't work.

3 It all comes down to communication. We,
4 as individuals, have to communicate to the
5 homeowner at a level they understand. We had 43
6 homes on the coast; 41 homeowners, 43 homeowners
7 were moved out. Ten million dollars were spent by
8 the builder. Every homeowner was going to sue
9 specifically over the heating system.

10 We were the experts that came in, along
11 with many other experts. No lawsuit. We met with
12 the homeowners over and over again; explained data
13 clearly, precisely; answered questions time after
14 time after time.

15 Now we're dealing with eight angry
16 homeowners with one particular plan type in Union
17 City. They are going to sue. Well, what they
18 really want is \$20,000. But when we got them the
19 data of why their homes are using energy, what's
20 going on, where it's going, oh, okay. And you
21 have to explain it at the level they understand.

22 That's my only thought. Did I say I was
23 Jeff Chapman from California Living and Energy?

24 (Parties speaking simultaneously.)

25 (Laughter.)

1 MS. MURPHY: Hello; I'm Linda Murphy
2 from the Heschong Mahone Group. And my only
3 question with regard to each one of these small
4 extra certifications that we've added here is I'm
5 concerned who's the person that actually monitors
6 the certification. Is that going to be a HERS
7 provider? Or are any of these certifications
8 going to modified by or monitored by the Business
9 and Professions Code?

10 I mean is it going to be elevated to
11 that kind of status, or is it just going to be a
12 HERS provider and Energy Commission review or
13 monitoring?

14 MR. PENNINGTON: This is going to be
15 overseen by a HERS provider. So this doesn't -- I
16 don't know quite how to answer the question. This
17 is not changing statutory law related to licensing
18 of contractors or that.

19 MR. SCOTT: Robert Scott with CHEERS.
20 I'm trying to -- we talked about this thing and it
21 is kind of confusing, all of these different
22 relationships between the various entities, which
23 I guess are functional in terms of how it's
24 supposed to make the system work. Because I think
25 it refers to the system.

1 For an example, we talk about energy
2 inspector who would go out and gather some
3 information. Will we get specific as to what
4 those protocols are for how they would assess
5 something versus we'll go in and say, you're this
6 old, we'll give you certain -- just allow the
7 default quick checklist approach. Versus the very
8 intensive go in, diagnose it. As the technology
9 changes by doing -- allowing ourselves to sort of
10 grow into this by using thermal imaging, using
11 measures that you can go in and probe to know
12 whether or not an old house actually has been
13 insulated.

14 So I guess I'm trying to figure out in
15 the functional description of the data gathering,
16 are we going to have some fixed set of protocol
17 that we can all depend on.

18 Because I get to another point here
19 which has to actually do with new construction,
20 and that is there are programs that the Commission
21 is operating now like New Solar Homes Partnership,
22 where HERS raters would go out and actually look
23 at the existing other features that are not part
24 of the normal HERS field verification.

25 And so I guess the point of this is just

1 that field protocols and inspection protocols are
2 going to be very important to establish, and
3 establish it right now. That might help us define
4 some of these roles and relationships.

5 MR. ELEY: Robert, the answer to your
6 question, your question about protocols, is yes.
7 In the RESNET manual there's an appendix A that
8 has a number of data collection and field
9 inspection protocols.

10 We are in the process of modifying that
11 now. And we anticipate that being an appendix to
12 the HERS technical manual.

13 And, you know, it will deal -- I mean
14 it's -- but we want to leave it somewhat flexible
15 if we can because, you know, new technologies can
16 be developed. Someone mentioned infrared cameras
17 a minute ago. So we don't want to close it, but
18 we want to leave it open.

19 It's going to be more informative than
20 mandatory, is the way I envision it.

21 MR. SCOTT: Okay. Well, I just think
22 that it's going to be a part of the person
23 gathering the data, if they're a home energy
24 inspector versus a HERS rater, are doing it the
25 same way.

1 MR. ELEY: Yeah.

2 MR. MAEDA: Bruce Maeda, Energy
3 Commission Staff. One of the things on -- we have
4 a special provision in the regulations as proposed
5 currently, especially with regard to home
6 inspectors being used as part of the program, or
7 building performance contractors.

8 Those programs need to be brought
9 forward by the provider and approved by the
10 Commission in a custom basis, in essence. So we
11 have to -- the model is obviously Checkup by
12 Geopraxis for the home inspector to use.

13 And we want to be able to accommodate
14 any shortcuts they may take in terms of data
15 gathering, but we had to -- we want to make sure
16 a) they're approved, and b) they're monitored by a
17 rater.

18 So I don't know whether that answers
19 your question, but right now we're trying to keep
20 it pretty flexible, very flexible.

21 MR. SCOTT: Right. And I'm just
22 wondering if someone is out there gathering
23 information about the home, is it a quick
24 checklist or -- we have developed -- we did
25 develop very distinct protocols for assessing

1 something with much more detail than maybe someone
2 wants to do in a flash.

3 So the question is, how much time are we
4 going to say is necessary for doing that
5 inspection versus just going off and doing the
6 checklist.

7 MR. ELEY: Well, when you look at --
8 we'll be covering some of the inputs this
9 afternoon, but the rater will have a choice in
10 many cases.

11 For instance, infiltration, the rater
12 can just accept a default and not make any
13 measurements. Or they can make measurements, and
14 if they do they have to follow the ASTM test
15 procedure for blower doors and so forth.

16 So, I think most of the inputs to the
17 rating process will have multiple options. So,
18 ranging from a default on one end to very detailed
19 diagnostic-like measurements at the other end.

20 MR. SCOTT: And will the score change?

21 MR. ELEY: Well, it's not in the HERS
22 technical manual at the moment. We've talked
23 about what -- and this is probably something that
24 we might consider in 2.2 or 3.0 of HERS. But the
25 score wouldn't change, but error confidence would

1 improve.

2 So we've talked about an error band
3 around these ratings that would be more narrow
4 with detailed measurements and broader with
5 defaults. But we're not quite there yet. I don't
6 think we're there yet.

7 But, that's where we could be five
8 years, four years, whatever.

9 MR. PENNINGTON: Let me just comment. I
10 think we do need to have some clarity about what
11 you're asking about. And we do need to have that
12 in the first version of this. And so that's a
13 next step for us.

14 Related to the idea of defaults versus
15 more precise measurement, if you look at Title 24
16 as a model for how we do things, generally when we
17 default we are conservative in what the savings
18 would be, what would be attributed to that.

19 And if there's more careful
20 investigation then that qualifies for more
21 credits. And I would think we would build on that
22 model for this.

23 So that's summertime work for us.

24 MR. DeSNOO: A comment on that point.
25 Neal DeSnoo, the City of Berkeley.

1 I think it's important for the consumers
2 to understand what the difference is based on the
3 default input or a measured one. So there might
4 be a different classification of rating. It might
5 have some sort of distinction so that they know
6 what they're buying; and somebody's providing a
7 rating that may cost more, they know what the
8 difference is.

9 And also for local governments who might
10 choose to use this as part of their local
11 regulatory scheme, we might want to establish a
12 standard that we need to actually do measurement
13 as opposed to defaults.

14 MR. BACHAND: Mike Bachand. Has there
15 been any -- when this work gets done, when the,
16 you know, insulation job gets added or windows or
17 better furnace, most of those are going to be
18 permit-sized jobs.

19 And on new construction we're
20 contemplating having a rating score, as opposed to
21 what we call a rating now, which is compliance
22 with the CF1R, et cetera.

23 Has there been some thought or is there
24 any indication that there's any intertie here with
25 the type of ratings we're talking about today with

1 the building departments and closure of permits or
2 any of that information?

3 I don't contemplate that, I'm just
4 wondering if anybody else has.

5 MR. PENNINGTON: Well, usually the
6 building officials' job is to verify whether the
7 improvement complies with requirements in Title 24
8 for energy, if there are such requirements. Or
9 for electrical code or plumbing code or structural
10 fire code compliance.

11 It's interesting as we move in the
12 future, perhaps the local governments will be
13 adopting local ordinances that call for energy
14 improvements based on a system like what's being
15 built. And the building department might have a
16 role in the future related to verifying that that
17 was actually achieved.

18 So, there's a meshing here that will
19 need to happen in the future.

20 MR. MAEDA: Bruce Maeda, CEC Staff.
21 There is, well, in most situations where Title 24
22 field verification rate is required for the
23 diagnostic testing and things. It's required to
24 be done by a totally separate individual.

25 In the case of a newly constructed

1 building where they're doing a whole-house home-
2 energy rating for that building, if the whole-
3 house energy rater also have a Title 24 field
4 verification rater, they can perform both
5 functions of both ratings in that particular case.

6 And that's because they're also already
7 required to be independent of the builder in both
8 situations, but they don't have to be independent
9 of themselves in that particular case.

10 MS. MCCOLLOM: Elizabeth McCollom with
11 Heschong Mahone Group. Not to beat this issue to
12 death, but by having so many different levels of
13 certification to do these inspections and
14 analysis, I feel like we're going to get a lot
15 more pushback from homeowners that don't
16 understand these different levels.

17 I am currently the Program Manager for
18 the Design For Comfort program, which is a rehab
19 program for existing multifamily buildings. And
20 as a requirement of the program the owner must
21 hire a HERS rater and an energy consultant to do a
22 home energy audit, basically. The HERS rater does
23 the inspection, initial inspection; the energy
24 consultant does the analysis; and the HERS rater
25 comes in at the end to do the verification.

1 We found that using a HERS rater that is
2 also an energy consultant saves us -- it takes a
3 fourth of the time to get through this process. A
4 lot of information is lost as it exchanges hands.
5 And, you know, just adding that extra
6 communication takes a lot of time.

7 So I feel like reducing the number of
8 these different parties able to do different
9 pieces of this puzzle would increase the
10 efficiency and make it run more smoothly.

11 MS. ASAN: Tenaya Asan, BuildItGreen. I
12 want to jump on that, as well, and talk some more
13 about collaboration because obviously, you know,
14 all of us have known that we've got to tackle
15 existing homes. And so there's lots of folks out
16 there who have started it in the absence of the
17 CEC being able to get this program going.

18 And so there's lots of resources out
19 there. We, ourselves, put together existing homes
20 green point rated, so we have a program that will
21 rate existing homes from all aspects.

22 And so as George was saying, you know,
23 there's all sorts of these credentials out there.
24 There's CBPCA out there, there's us out there,
25 there's lots of protocol out there. We talked

1 with all those folks when we were trying to
2 develop our program.

3 So, as I looked at what you have
4 produced it appears as though most of that has
5 been more of inhouse with your consultants. And I
6 would like to encourage you to bring in those
7 folks that are already working with existing homes
8 in the state and get their input in putting
9 together these protocols for how we're actually
10 going to implement and evaluate the house.

11 MR. EASH: I'm sorry, this is it,
12 absolutely. John Eash. Final thing. I'm not
13 going to say anything else. I'm leaving, as a
14 matter of fact, for the rest of the day.

15 And this is a little bit out of the
16 order of what we're doing, and I apologize to you,
17 Bill. I said I wasn't going to talk at all. You
18 knew I would.

19 I am very concerned that we only have
20 one week of public comment from this workshop. I
21 would like us to be able to have the transcript or
22 at least a summary of these questions and answers
23 before we ended the comment period.

24 This is very difficult for both my
25 client, myself, and I think some others, to try to

1 digest all of this, in my opinion, good stuff that
2 you're doing here in this one-week period. And I
3 would certainly like to have a little bit more
4 time before we had to close out the public comment
5 on this workshop.

6 And that's all, thank you very much.

7 (Applause.)

8 MR. SEGERSTROM: Hi, I'm Charles
9 Segerstrom with Pacific Gas and Electric. And
10 I've been working on the HERS program since 1993
11 nationally, but to commend the Commission and the
12 consultants for getting us to where we are today.

13 Eight years ago we had hoped it would be
14 a little bit sooner, but now I think we get a feel
15 for the fact that there is an elephant in the room
16 of energy efficiency; and that elephant is
17 existing housing.

18 We've had 30 years of good work in
19 California on new homes. We need to create a very
20 fast track to address this problem of existing-
21 home inefficiency and the carbon footprint that's
22 huge.

23 So, I actually agree that because of so
24 much of a mass market need that to start over with
25 something that sets the bar up here doesn't

1 recognize all the intermediate steps of all the
2 efforts that are going on, and might actually slow
3 things down rather than accelerate.

4 So, having all these confusing segments
5 of the marketplace at this point in time I
6 actually think is unnecessary. Because we need to
7 have as much action as possible as soon as
8 possible, with an ultimate goal of simplifying it.

9 And another goal of trying to figure out
10 who the customer is. Is the customer, as with
11 RESNET, the mortgage industry, for which their
12 standards were written. Or is the customer the
13 potential performance-based tax credit
14 documentation. Or is the customer really the
15 human being that we're trying to convince to do
16 something new.

17 So, you know, we need to have a
18 dialogue; we need to figure out how to get to
19 something better than all these bits and pieces.
20 I'm at the benefit of the bits and pieces, as you
21 acknowledge. Players in the market, you get them
22 moving in a clear direction, and, you know,
23 appreciate the fact that you've been mindful of
24 work that's gone on.

25 We've not gotten it right forever. In

1 1981 we had RCS requirements that missed the mark.
2 This time we need to meet the mark, but you know,
3 I do think starting out where you are,
4 acknowledging what's going on in the market,
5 linking it together, you know, working on getting
6 this dialogue going. And it's been for 30 years
7 for new homes. Well, we'd need to condense that
8 and make sure there's adequate time for these
9 really really critical existing-home programs.

10 Thank you.

11 (Applause.)

12 MS. LAM: Thank you for everybody's
13 comments. Because we're a little bit behind
14 schedule now we're going to move into the building
15 performance contractor presentation.

16 MR. SUYEYASU: One of the key features
17 of the regular rater certifications is that the
18 raters need to be independent entities, as it's
19 defined in the regulations, from anybody who's
20 actually doing the contracting work on the house
21 to improve its energy efficiency.

22 This provision is in there to protect
23 consumers from some of the things we've discussed.
24 The window contractor coming in, posing as a rater
25 and saying your house needs lots of windows; let's

1 install those windows right now.

2 But there's obviously a role for the
3 people who do ratings and do the audit of the
4 house to come in and actually perform the work and
5 try and close that gap between recommendations and
6 actually getting the work done.

7 And so we have provided special
8 exception to the conflict of interest protections
9 in the regulations for building performance
10 contractors who are willing to submit themselves
11 to a slightly higher standard of care and quality
12 assurance and certification.

13 This is not in the slides, but if
14 anybody needs to look at it, looking at section
15 1673(i)(3) of the regulations which is where the
16 conflict of interest protections reside. And
17 there's a special exception in there which reads:

18 Building performance contractors working
19 as a home energy auditor with an Energy
20 Commission-approved special program as part of a
21 provider's rating system, as specified by the HERS
22 technical manual, are not required to be an
23 independent entity from the persons or firms
24 performing the work on a home."

25 So that's essentially stating the

1 exemption that you can audit a home and work on
2 it, as well, if you are willing to submit to these
3 special provisions.

4 The building performance contractor
5 seeks to do this, obviously the conflict of
6 interest protection is going to kick in in the
7 first place, they do need to be certified as a
8 whole-house home-energy rater. And then the
9 heightened quality assurance and performance
10 procedures kick in after that.

11 Some of the heightened quality assurance
12 procedures for building performance contractors.
13 When a list of measures is produced as part of a
14 recommendations, there are maybe ten measures on
15 there. And when a normal rater gives this to the
16 consumer, the consumer is then, to some degree, on
17 their own to decide what to do after that because
18 that rater is independent from the contractors.

19 But in this case the rater may have some
20 influence in trying to push the consumer to do
21 certain measures over another; and it's possible
22 they could push them to do measures that are more
23 profitable for the building performance
24 contractor, but less cost effective for the
25 consumer.

1 So, what we're requiring is that after
2 the work is performed the building performance
3 contractor just needs to do a brief explanation to
4 both the consumer and to the provider why any
5 specific cost effective measures that were on the
6 standard report weren't implemented.

7 So if there were some extremely cost
8 effective measures near the top of the list, the
9 first four or five, that the building performance
10 contractor just didn't think would be very
11 profitable for them, and they tried to steer the
12 consumer past that, there would at least be some
13 justification they would need to make as why did
14 the consumer not do those measures that were on
15 the list that were considered cost effective.

16 Any work that's performed on the home by
17 the building performance contractor that would
18 require Title 24 field verification and diagnostic
19 testing would still need that field verification
20 and diagnostic testing performed by an independent
21 entity. So even though they are trained as a
22 rater, they will need to bring somebody else in to
23 do that inspection, such as modifications to duct
24 work or anything else that might trigger those
25 requirements.

1 The building performance contractor
2 shall disclose to the consumer not only why they
3 didn't do certain measures on the list of
4 recommended measures, but whether they should also
5 disclose that basically that the rater has a
6 financial interest in the work being performed.
7 That should be pretty obvious, but that's worth at
8 least putting upfront in writing when the measure
9 is being recommended for reasons other than
10 efficiency, such as safety and comfort.

11 So, on the list of recommendations if
12 the building performance contractor says you
13 should do this because it will, you know, improve
14 your occupancy and comfort in the house, it'll
15 bring your temperature up even though it won't
16 actually save you any money, it will make it so
17 you can heat your house above 60 degree in the
18 winter, they need to disclose that that's the
19 rationale for making the recommendation, as
20 opposed to just energy efficiency.

21 And then finally is the thing we
22 discussed already is why standard approach rating
23 recommendations were not implemented. And that
24 disclosure requirement only applies to the
25 standard approach rating recommendations, not the

1 custom approach recommendations.

2 So those are the ones that will be
3 automatically produced, and to some degree should
4 be a fixed set of recommendations that would be
5 produced no matter who the rater is looking at the
6 building.

7 Heightened quality assurance procedures
8 for the building performance contractors, we'll
9 discuss this later, but the model that we're
10 developing has a way of looking at a home after
11 the retrofit has been completed. And analyzing
12 whether or not the savings that were predicted by
13 the recommendations are actually realized.

14 So we are mandating that 12 months
15 following the implementation of measures in a
16 house by a building performance contractor, in a
17 post-retrofit analysis of the home be done, if it
18 can be done. This does require data on energy use
19 before the building was retrofitted. And that
20 that analysis be shared with the homeowner and the
21 HERS provider. This will be discussed some later
22 by Charles, and you'll sort of see what these
23 graphs look like.

24 But there's going to be a projection
25 from the recommendations on how much energy will

1 be saved. And then using this model and
2 standardizing it to variations in the weather, it
3 will actually see if the energy savings that were
4 recommended were actually delivered on the home,
5 if possible.

6 MR. SPEAKER: Is this -- on the bottom
7 where it says for everything that can be tested
8 will be tested, basically. Does that apply to the
9 5 percent or is that every time -- is that third
10 party?

11 MR. SUEYASU: The thing that I'm
12 discussing now, the 12-month after --

13 MR. SPEAKER: Okay, (inaudible) --

14 MR. SUEYASU: Sorry. Utility bill
15 analysis, that is for all homes where the data is
16 available to do that.

17 MR. SPEAKER: -- the slide, I'm sorry.

18 MR. SUEYASU: That's okay. The quality
19 assurance checks that we'll discuss shortly, 1
20 percent of every rating needs to be checked by the
21 provider, double-checked afterwards to see -- by a
22 quality assurance personnel to see if the rater's
23 doing good work, and if that quality assurance
24 check is comparable with the initial analysis.

25 This requirement is pushed up to 5

1 percent for ratings and work that's done by
2 building performance contractors. Just to have a
3 heightened degree of consumer protection there.

4 And the last bullet is that all
5 improvements to the home carried out by the
6 building performance contractor that can be field
7 verified or diagnostically tested shall be
8 verified or tested following the procedures in
9 reference appendix RA-3.

10 And this is spelled out a little bit
11 more clearly in the regulations. But what we're
12 looking at there is there are standards for
13 heightened performance in doing energy efficiency
14 measures that are laid out in the Title 24
15 regulations, such as quality insulation
16 installation.

17 So if you are a building performance
18 contractor and you are installing insulation you
19 actually need to make it meet that field
20 verification diagnostic standard that's in Title
21 24. So building performance contractors cannot do
22 bad insulation installation.

23 You wouldn't expect them to in the first
24 place, but they actually have to certify; they can
25 field verify that, themselves, if it's not part of

1 the Title 24 energy compliance. But they need to
2 bring it to that standard. And that's something
3 that 5 percent field check will be looking at.

4 Any clarification questions or
5 commentary questions about the special provisions?

6 MR. GOLDEN: In general I think that we
7 encompassed the issues very well. Actually this
8 isn't even a commentary on the building
9 performance except that when we're talking about
10 multiple bottomlines in terms of efficiency gains
11 and health and comfort gains. And it almost
12 occurred to me maybe we should push it the other
13 way. Because I can't think of almost anything
14 that doesn't have multiple bottomlines that the
15 homeowner should know about.

16 And if we're talking about adoption
17 maybe we should be pushing quantifying those
18 multiple reasons to do the work into all of the
19 energy ratings, not just saying that, you know,
20 even changing a light bulb reduces cooling load.
21 It does other things.

22 And so almost everything that we're
23 doing, even if it's not a home performance
24 project, even if it's an energy rater making
25 recommendations, have these alternative benefits.

1 And we get really myopic -- the CEC's looking at
2 energy consumption. But from the adoption
3 standpoint it would be great to actually move that
4 in the other direction, and start talking about
5 multiple returns no matter what. Because that
6 leads to better adoption.

7 That was really my only comment.

8 MS. LAM: Could you state your name
9 again for the court reporter?

10 MR. GOLDEN: Sorry. Matt Golden.

11 MR. RIEDEL: Hi, I'm Randal Riedel,
12 Managing Director of the California Building
13 Performance Contractors Association.

14 I wanted to just respond to one of the
15 comments that was made into the cost effectiveness
16 of things that we would do. And many times what
17 happens is that we find significant safety-related
18 issues that determine health and safety-related
19 aspects, even to the degree where we would pull
20 like a gas valve handle off and call the building
21 department to red-tag the unit because of the
22 severe potential of health and safety risk to the
23 occupants.

24 And what that does is that actually
25 preempts anything related to energy, from our

1 perspective. And then we go ahead and take care
2 of the energy efficiency elements, as need be.

3 So I just wanted to point out that
4 that's a lot of the times the impetus that drives
5 us in regards to the selection of the measures
6 that we do.

7 The other thing is that there's been a
8 lot of research done on the nonenergy benefits, or
9 the NEBs aspect of this, also. And people are
10 motivated truly by energy and other issues
11 concerning the environment these days. But they
12 also are driven by other issues in regards to
13 their health, safety, comfort; and also wanting to
14 contribute to the betterment of the environment
15 and things of that nature. And so those drive
16 them, also.

17 Just wanted to point those particular
18 things out. And, I think, Loren Lutzenhiser, you
19 quoted some of the work that he's done, which I
20 think is really fine, concerning where the
21 particular large amount of energy is currently
22 being used in the quartiles as represented by what
23 is happening in regards to the -- I'm just
24 dropping this out of my head right now -- but it's
25 the census bureau quartiles.

1 And we are finding that, in fact, the
2 highest quartile of the economic strata, people
3 are using about 52 to 56 percent of the energy
4 total.

5 So it's very interesting to me because
6 those are the individuals who have the
7 discretionary income to help resolve these
8 problems, and also who do want to make other
9 commitments of legacy.

10 So, I hope that makes some sense to
11 everybody, and thank you for the opportunity of
12 speaking.

13 MR. BACHAND: Mike Bachand. I wasn't
14 sure about the 12-months additional audit. Can
15 you flip back to that slide? I think it was the
16 last one. The 12 months following implementation
17 of improvements.

18 MR. ELEY: We're going to talk about
19 this post-retrofit energy bill analysis a little
20 bit later. But in the HERS regulations it's an
21 optional requirement, but for building performance
22 contractors, the recommendation is that it be
23 required.

24 MR. BACHAND: Right, so is there
25 language now that speaks about how that happened,

1 who pays for it, who does it, what the
2 consequences are if it doesn't meet whatever
3 standards are envisioned that it should meet? I'm
4 not sure. I'm not real clear on what that thing
5 would be all about.

6 MR. ELEY: Well, that'll be on the
7 agenda this afternoon.

8 MR. BACHAND: later? I'll be here.

9 MR. SCOTT: Robert Scott with CHEERS.
10 About performance contractors, I know that there
11 are not a lot of performance contractors that we
12 currently have. And if this thing were to take
13 off in a really big way, as Charles likes to say,
14 there's the million opportunities every year,
15 that's an awful lot of work that's going on.

16 One of the things that I consider is the
17 relationships of being able to find some consumer
18 protection, and the relationships that you would
19 know between raters, contractors, how the work's
20 done, and the consumer. And I just think that
21 would be important, that you might be able to link
22 up raters with contractors, and performance
23 contractors, in hopefully getting more performance
24 contractors.

25 And maybe we can take a page out of some

1 of the Title 24 work, which are the three-party
2 contracts that allow the relationships to be
3 exposed so you have this relationship clearly
4 indicated to the consumer, to the contractor and
5 to the raters, so everybody knows what's going on.
6 And that might help develop more performance
7 contractors and provide raters so they can get out
8 there and really spread this out.

9 So that's just a comment on that.

10 MR. NESBITT: George Nesbitt. When I
11 became an existing-home rater seven years ago it
12 didn't take long for me to discover that the
13 computer told me that the houses I'm looking at
14 should use three times more energy than they
15 actually did.

16 So, you know, I went to bill-based
17 auditing right away, and actually developed some
18 spreadsheets, actually struggled with a program
19 called TREAT, which I was required to buy as part
20 of the CBPCA, which did many of the things we're
21 going to be talking about today.

22 But then the other thing is the dilemma
23 with just doing a rating or an audit is the
24 industry that's out there to perform the work
25 well. And at that time the residential contractor

1 program was going on. Unfortunately, it died out
2 soon thereafter.

3 So, doing ratings or audits without a
4 link to the actual work is somewhat limited. And
5 so as a contractor, you know, you had to be more
6 the building performance contractor.

7 The other thing is getting people to pay
8 to just do a rating or an audit. So, there's a
9 lot less sort of financial upside to just doing
10 that one end.

11 And at the same time, as a rater, and
12 ultimately our goal, our customer is ultimately
13 the ratepayers, the utility ratepayers, you know,
14 whether it's our direct customer or the customer
15 that buys the home, whoever it ultimately is.
16 It's whoever ultimately pays those bills and
17 suffers the high-bill problems, the comfort
18 problems and all those issues.

19 And so in a lot of ways building
20 performance model is in some ways a better model;
21 but we do need both. So we need to have somehow
22 find a way to make ratings an audits viable and
23 also make people do the work and get it done and
24 get it done right.

25 And I'm really glad that we will

1 finally, after five years, actually have some
2 standards as building performance contractors that
3 will have to live up to because it's been wide
4 open the past five years.

5 And I'm just also not totally sure about
6 whether, as currently written with the building
7 performance contractor being able to do the
8 initial audit, which is not a rating, do the work
9 and then be able to perform the actual rating at
10 the end of the job.

11 And whether or not we should go there
12 yet. Whether we should keep a little more
13 separation between the rating and the performance
14 contractor end. I'm not totally sure. I mean I
15 believe in both systems, and I think they
16 complement each other.

17 And so having some independent, you
18 know, rater verification of building contractors,
19 especially when it comes to utility rebate
20 programs. I've done some M&V work on, you know,
21 boatloads of money that have been paid out for,
22 you know, the standard typical industry practice,
23 which we know does not even meet minimum industry
24 standards, let alone codes.

25 So, -- and actually I submitted comments

1 yesterday for these. And I also want to echo the,
2 you need to extend the comment period because most
3 of us here have only had the past week to look at
4 these documents. While some of the industry
5 stakeholders have been working on this for some
6 time. And we, as HERS raters, as part of the
7 CalHERS, want to be recognized as an actual
8 industry stakeholder, because we are separate from
9 the providers and the various other interests here
10 today.

11 So, thank you.

12 MR. GOLDEN: I just wanted to, when we
13 talk about certifications, consider where BPI
14 certification fits in with California
15 certifications. Is there any kind of equivalency
16 that we can do?

17 We're just -- we just really like, you
18 know, HERS is very lined up with what's going on
19 nationally; BPI is a good national footprint in
20 terms of diagnostics training and things like
21 that. So might be another way to standardize and
22 have less confusion in the marketplace. So I
23 don't know if there's any consideration to that.

24 MR. PENNINGTON: So it seems like
25 there's a natural dovetailing of the BPI

1 certification process with what we've tried to
2 outline for building performance contractors.
3 And, you know, we kind of haven't said --

4 MR. GOLDEN: Well, there is --

5 MR. PENNINGTON: -- some specific, you
6 know, program that is in the market would, you
7 know, that has its proprietary aspects to it. We
8 haven't listed that in our regulation.

9 MR. GOLDEN: Right.

10 MR. PENNINGTON: But it seems like that
11 is a program that has the capabilities to meet the
12 requirements that we tried to state in a more
13 general way in the regulations.

14 MR. GOLDEN: Okay. Yeah, and just from
15 a straight functioning business standpoint, it's
16 just really important. Every time -- can do is
17 making sure that there are ways to challenge all
18 these tests and equivalencies, because the cost of
19 sending people to these expensive trainings that
20 are sometimes duplicate training, and paying for
21 testing and more testing. And the amount of down-
22 time. It really gets extremely expensive, so just
23 trying to keep that in mind and make it
24 affordable.

25 MR. PENNINGTON: That's a very good

1 point.

2 MR. SUYEYASU: One last thought.

3 MR. CONLON: One last thought. Tom
4 Conlon with Energy Checkup, again. Just briefly
5 on the conflict of interest section, everybody
6 knows that I have cared a lot about this in the
7 past. I actually think we're moving toward a real
8 solution here, so I wanted to again commend the
9 Commission for this work.

10 I do think we should be a little more
11 specific about the definition of what performs
12 work on a home is. That's a little bit open right
13 now and perhaps some of the measures could be,
14 installing appliances. Is that work on a home? I
15 just want to be maybe a little bit more specific
16 about that definition. Is that clear? Is my
17 comment clear? I'm not sure I expressed it --

18 MR. PENNINGTON: Yes, your comment's
19 clear.

20 MR. CONLON: Thank you.

21 MS. LAM: Okay, we're going to wrap up
22 the morning session with the quality assurance
23 procedures.

24 MR. SUYEYASU: For people who have been
25 following the existing rating program many of

1 these quality assurance procedures will seem quite
2 similar. There's just a few amendments that have
3 been made from the existing regulations.

4 As noted, all auditors and raters must
5 remain independent entities, which is defined in
6 the regulations as having no financial interest,
7 from the contractors who perform the energy
8 efficiency work on a home; or the builders or
9 contractors of newly constructed or modified homes
10 in the case of Title 24 compliance.

11 One percent of all the ratings that are
12 received by a provider will be repeated by a
13 provider's quality assurance reviewers who will go
14 out and conduct the exact same rating and see if
15 their rating score or certification is the same as
16 the original rater provided. And if there's not,
17 that will be handled.

18 In addition to 1 percent of all the
19 ratings that come in to a provider, the provider
20 will make sure that 1 percent of the ratings
21 conducted by each rater, or at least one per year,
22 are also field checked. So any given rater will
23 have 1 percent of all their work field checked
24 after they've done it.

25 These field checks are quality assurance

1 reviews that happen will essentially be blind
2 reviews. The rater who does the initial work
3 won't know which house that they're rating is
4 going to be field checked later.

5 The provider won't essentially pull a
6 tag on a particular rating to go double-check it
7 until after either the CF4R has been submitted, if
8 it's a Title 24 compliance rating, or until the
9 rating is, you know, given to the homeowner if
10 it's a rating for doing a whole-house home-energy
11 rating.

12 A general standard that's in the
13 regulations says that the quality assurance check
14 shall confirm that the initial rating was
15 accurately completed.

16 We didn't get into this in too much
17 detail, but for building performance contractors,
18 they'll be doing an initial assessment of a house
19 before they begin the work that won't provide a
20 final rating score, but will give them the
21 recommendations upon which to work. And then
22 they'll do a full rating after they do the work
23 for the sort of the check-out rating.

24 The field check for that type of work
25 will include analysis of the initial assessment

1 that produced the recommendations before they did
2 the work to see if that was done well, as well as
3 an assessment of the rating that was produced
4 after the work was performed.

5 And there's a new requirement in the
6 case of Title 24 compliance ratings whereby the
7 homes that are passed for compliance purposes as
8 being part of a sampling group, the sampling
9 groups of seven are up to 30 for some procedures.
10 One percent of those homes that were never even
11 tested to begin with, but were passed as part of a
12 sampling procedure, those will be field verified.
13 Or I guess it's the lesser of one or 1 percent in
14 any group.

15 What's that?

16 MR. SPEAKER: For each rater.

17 MR. SUYEYASU: For each rater that works
18 on that group. So there will be some field
19 verification and diagnostic testing procedures for
20 homes that were never tested in the first place,
21 just to make sure that sampling process is working
22 well.

23 And just a brief review here. The
24 providers essentially have these personnel working
25 for them already, but we're formalizing it to some

1 degree. Each provider needs to designate a
2 quality assurance manager, which is somebody with
3 the provider who is to some degree ultimately
4 responsible that the quality assurance process is
5 working well with that provider.

6 And then that provider will also
7 designate quality assurance reviewers who will be
8 raters who are going out in the field to do these
9 double checks of the initial ratings.

10 The QAMs and QAR, quality assurance
11 manager and quality assurance reviewers, those
12 names need to be submitted to the Energy
13 Commission for approval by the Executive Director
14 of the Commission.

15 Matt, you look like you have a question.
16 Do you mind coming up.

17 MR. GOLDEN: Okay, sorry. Matt Golden,
18 again. So just going to play devil's advocate,
19 because maybe I'm just being a little dense here.

20 So I understand on the rater's side when
21 we're doing a rating that's required at the time
22 of sale, but that needs to be verified.

23 But as a building performance
24 contractor, like if I'm part of the Home
25 Performance with EnergyStar, I get the logo, and

1 then I get to be part of that program. And that's
2 why they do the verification.

3 But why do I even want to tell you guys
4 that I'm doing building performance? Don't you
5 just care about the rating? Why don't I just tell
6 you I'm a rater? What am I getting out of having
7 additional compliance work to do?

8 There's no mandatory building
9 performance component of it. Couldn't I just do a
10 rating at the end? Why would I want to be part of
11 this program and submit to more verification?

12 MR. SUYEYASU: You couldn't do a rating
13 that's an official California whole-house home-
14 energy rating because you would be conflicted out
15 of doing that, because you have performed the work
16 on the house before the rating was done.

17 So anybody --

18 MR. GOLDEN: Even if I do the rating,
19 then I submit my whole body of work to
20 verification on just the rating, and then maybe I
21 just don't want to be in the rating business or --

22 MR. MAEDA: Well, you should either have
23 an independent rater do it, or not do a rating.

24 MR. GOLDEN: But then if I'm just going
25 to do the rating, why do you -- by doing the

1 rating I'm submitting the whole body of work to
2 being verified.

3 MR. MAEDA: Yes.

4 MR. GOLDEN: Isn't that still just the
5 rating just based on the results of the work? I
6 mean, is this the same compliance that I'm going
7 to be doing for home performance with EnergyStar?
8 I mean it's still 5 percent -- with that program,
9 or is it going to be 10 percent because they're
10 both random?

11 So I'd encourage that to be synched up.
12 And I'm not even -- I'm just trying to be a
13 devil's advocate looking at this here, because it
14 seems like -- I'm not sure what it's -- since
15 you're not really doing anything to incentivize
16 building performance, and not really why that is
17 even at the end of the day.

18 And the rating's not the beginning; it's
19 just the end result rating, right?

20 MR. MAEDA: Yeah.

21 MR. GOLDEN: So why are we looking at
22 the whole body of work, not just the rating, and
23 is that rating accurate at the end?

24 MR. PENNINGTON: So we're trying to
25 maintain this avoidance of conflict of interest.

1 MR. GOLDEN: Right.

2 MR. PENNINGTON: And we're trying to
3 avoid having the rater and the contractor be one
4 and the same, or have business relationships that
5 create conflicts.

6 But we're trying also to recognize that
7 the building performance contractor's model is a
8 different model. I mean it's basically trying to
9 have the building performance contractor involved
10 in the oversight of the work, or even doing the
11 work.

12 So we're trying to create a situation
13 where both of those can co-exist and be part of
14 the system, but we want some more assurance that
15 the building performance contractor's involvement
16 in the project is not resulting in a consumer
17 issue that would have been protected if they had
18 not been exempted from the conflict of interest
19 provisions.

20 And so --

21 MR. GOLDEN: Okay. And I totally agree
22 that we need more. I was just trying, like I
23 said, I'm still -- I guess, but the reason that
24 we're worried about the end rating, right, if you
25 do the work.

1 Anyway, I'm on board with that. Just
2 trying to get --

3 MR. PENNINGTON: So, so, so it is
4 conceivable. I think Bruce mentioned that if --

5 MR. GOLDEN: We just do the work, get a
6 third-party rater, and then it's off the radar.

7 MR. PENNINGTON: And so the third-party
8 rater has no conflicts.

9 MR. GOLDEN: Okay.

10 MR. PENNINGTON: And so you could have
11 that independence and that would satisfy the no
12 conflicts.

13 MR. GOLDEN: Okay. The only other that
14 occurs there is coordinating with home performance
15 of EnergyStar so that we're doing one set of 5
16 percent verification, not two. And that would be
17 to the provider, anyway, like CBPCA.

18 MR. PENNINGTON: I agree with the idea
19 of coordination; whether or not we could supplant
20 this with that, I don't know.

21 MR. GOLDEN: Sounds like the same kind
22 of thing that's --

23 MR. PENNINGTON: We need to better
24 understand what they're doing, I agree with that.

25 MR. GOLDEN: Yeah. And then also who

1 pays for these verifications is kind of
2 interesting. You guys would think, like do we
3 have to pay to have our fourth verifier? How does
4 that work. So, anyway, just being coordinated so
5 we're not, and then it's being 10 percent of lots
6 of different people and things like that.

7 MR. PENNINGTON: Thanks.

8 MR. NESBITT: I'll just make one quick
9 comment. George Nesbitt. As far as quality
10 assurance, what would be nice as a rater and as a
11 home performance contractor, is to have feedback
12 on what's going on in the field. And I think Neal
13 DeSnoo also mentioned wanting to know kind of like
14 by area what kind of things are being found.

15 I'd like to know how many HERS
16 verifications there were in California in 2007.
17 Where they were, what programs, what measures. I
18 mean this is valuable market data to be used as a
19 rater.

20 It's also valuable to know, especially
21 on the Q&A, what kind of problems are being found.
22 Wouldn't it be better if I'm alerted to it before
23 I make the mistake; then having you have to bust
24 me at the tail-end?

25 I mean my idea is I try to do it right

1 the first time, because it's a lot more expensive
2 and harder the second time. So, that's, I think,
3 an appropriate comment for this section. Thanks.

4 MS. LAM: Are there any more comments?

5 MR. JOHNSON: Scott Johnson, IHACI. I
6 have a -- or organization, you know, we're
7 primarily an HVAC organization, and we have a
8 general membership meeting; we haven't had one in
9 12 years because of everything that's going on up
10 here in Sacramento.

11 And I'm just kind of wondering, there's
12 a lot of our guys, I spent six years, six long
13 years training the HVAC industry down there to
14 understand the whole house concept. And I'm going
15 to be, you know, in the trick bag there answering
16 questions with hundreds of contractors that are
17 going to be a little bit lively.

18 And I'm wondering, am I going to be able
19 to tell them, these guys that say okay, I want to
20 go out and I want to start, you know, fixing the
21 shell house and testing, doing this, insulating,
22 blah, blah, blah.

23 Am I going to have to tell them oh, you
24 can't do any of this work unless you get a rating
25 done? Is that where we're going with this?

1 MR. PENNINGTON: If you're going to be
2 doing a rating, you're going to be calling this --

3 MR. JOHNSON: No. On these contractors
4 are --

5 MR. PENNINGTON: Let me just finish.

6 MR. JOHNSON: Go ahead, I'm sorry, Bill.

7 MR. PENNINGTON: If you're going to be
8 doing a rating and you're going to be calling it a
9 rating --

10 MR. JOHNSON: I'm just --

11 MR. PENNINGTON: I'm just saying that's
12 the setup here.

13 MR. JOHNSON: Right.

14 MR. PENNINGTON: Then you need to follow
15 the regulations.

16 MR. JOHNSON: Exactly. How about if I
17 couple it this way. Utilities I'm supposed to
18 call a meeting with the utilities, too. Are the
19 utilities probably going to be asking for a rating
20 with the rebate programs on whole house, or maybe
21 this is not the place to talk about it.

22 You know what, how about if I talk to
23 you at lunch?

24 MR. PENNINGTON: Good deal.

25 MR. JOHNSON: Shut up, Scott.

1 (Laughter.)

2 MS. LAM: I guess everybody's hungry, so
3 we'll leave for lunch and we will reconvene at
4 1:30. And for those of you who are not familiar
5 with this area, two blocks east, that's a LaBou,
6 and a Vallejo's Restaurant. And then a block
7 southeast there's a Chinese eatery and a sandwich
8 shop.

9 (Whereupon, at 12:41 p.m., the workshop
10 was adjourned, to reconvene at 1:30
11 p.m., this same day.)

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AFTERNOON SESSION

1:35 p.m.

MS. LAM: I hope everybody had a nice lunch. So we going to do energy modeling presentation at this point.

(Pause.)

MR. ELEY: I guess I'm on, right?

Next slide, please. This is the equation for the HERS index, which is the -- and so it's really the ratio of energy used in the rated home to the energy used in the reference home.

And so TDV rated is the energy that would come out of the model. TDVPV would be the TDV energy that would be produced by photovoltaic systems, or could be wind or other renewable energy sources.

So that's subtracted from the TDV energy that the home uses. This is divided by the TDV energy of the reference home, multiplied by 100. And there's your index.

So this, as we discussed this morning, this index includes the traditional energy uses that have always been regulated by Title 24, which is heating and cooling and hot water, but also

1 fans; and now mechanical ventilation.

2 But we're adding to it lighting and
3 appliances energy, which we're going to talk about
4 shortly. And also it includes exterior lighting
5 that's attached to the building. It does not
6 include pools, spas, tennis courts, well ponds,
7 grinder pumps, things like that.

8 Now this is not to say that the
9 recommendations, especially the custom
10 recommendations, won't address these energy uses.
11 But they're just not in that energy, that HERS
12 index that we're defining.

13 Next slide. There's another twist to
14 this which we didn't talk about this morning, but
15 I want to bring up now. And that is that the
16 reference house energy use is capped at 2500
17 square feet. So if you're rating a home that say,
18 has 5000 square feet, and that rated home would be
19 comparing it -- the reference house would be
20 comparing the two, would be half that size; it
21 would be 2500 square feet.

22 And the energy uses for the scaled back
23 reference home for heating and cooling energy
24 would be just the proportion of -- it would be the
25 floor area of the -- it would be the ratio of the

1 2500 divided by the floor area of the rated home.

2 So if the rated home were 5000 square
3 feet, you divided 2500 by 5000 square feet, and
4 the TDV energy for heating and cooling would be 50
5 percent or half of it.

6 So this is something we've included to
7 account for home size. At least, it only accounts
8 for home sizes once you achieve this 2500 square
9 feet level. The derivation of the 2500 square
10 feet is addressed in the topic report, which is
11 one of the documents that's posted with the
12 workshop notice here.

13 But it basically represents the average
14 home in California, plus one standard deviation.
15 That's kind of the basis of that number.

16 Now, other components of energy use like
17 interior lighting and appliance use and so forth,
18 there's a methodology we're going to discuss in a
19 few minutes on how those are calculated. And for
20 the reference home you just enter that methodology
21 with 2500 square feet. So the process is slightly
22 different from just scaling it back. But it
23 achieves pretty much the same net result.

24 Refrigerators and dishwashers, there's
25 no adjustment to those. Those are not scaled back

1 by home size.

2 So this is an important feature. The
3 thinking behind this is documented in the topic
4 report.

5 Next slide. I also wanted to address
6 how greenhouse gas emissions would be calculated.
7 The time-dependent valued energy numbers that the
8 Energy Commission uses account for the mix of
9 generating type for each hour of the year. So we
10 know, for instance, what percentage is coal,
11 nuclear, hydro, gas and so forth, for every hour
12 of the year.

13 And with that knowledge, we know the
14 emission rate for that hour, per kilowatt hour of
15 electricity use. And all of these numbers are
16 published with the time-dependent value
17 multipliers that are already used in the
18 compliance calculations.

19 So we're recommending in the
20 regulations, in the technical manual, that those
21 hourly emission rates be used when determining the
22 greenhouse gas emissions.

23 The table at the bottom here shows that
24 there's about -- CO2 emissions are -- let's see,
25 .5; these are tons per gigawatt hours. So, tons

1 per -- if you translate that to kilowatt hours
2 it's about .56 pounds per kilowatt hour of carbon
3 dioxide emissions. But those are just average
4 numbers from the data I was describing. It would
5 not be used in the calculations.

6 So the process for doing this is already
7 well established. It's been vetted, and that's
8 the process we propose to use for determining
9 greenhouse gas emissions.

10 The other pollutants listed here are not
11 technically greenhouse gases. That's not SOx and
12 PM10. Those are also available from the same
13 process, and could be reported. But what we're
14 required to report, greenhouse gas emissions, and
15 not these other things, although I suppose those
16 could be added to the report.

17 Next slide. Since 1988 the Energy
18 Commission has had a document called the ACM
19 approval manual. And the ACM approval manual lays
20 out all the methods and procedures for calculating
21 energy use in homes.

22 It also lays out the methodology for
23 defining the standard design building and the
24 proposed design building which are used in
25 performance calculations.

1 Rather than reinventing the wheel we,
2 for the HERS modeling process we're proposing to
3 use most of the modeling assumptions in the
4 residential ACM manual. And as we go through the
5 presentation this afternoon I'll call your
6 attention to the exceptions that we're making to
7 those. There are some notable and important
8 exceptions.

9 But for the most part, we are using the
10 modeling assumptions, including thermostat
11 settings, schedules of operation, and so forth
12 that are all a part of the ACM manual. So these
13 would be the same modeling assumptions that are
14 used for code compliance purposes.

15 Next slide, please. So, remembering
16 that the HERS index is the ratio of TDV energy of
17 the rated homes, the TDV energy of the reference
18 home, we need to define the reference home.

19 So, the reference home is a building
20 that's similar to the rated home, but one that's
21 modified to exactly meet the requirements of the
22 2008 energy efficiency standards. There are a few
23 other specifications in the HERS technical manual,
24 but that's the main thing.

25 The process of generating the reference

1 home is not something that the rater would do.
2 This is something that would be required that this
3 be buried into the HERS software. And so the
4 rater would just enter information about the rated
5 home. And the reference home would then be
6 automatically created and generated from the data
7 entered on the reference home. So, it's not like
8 you have to enter the data twice. You enter it
9 once, and then the software takes care of it from
10 there.

11 There's a number of fixed and restricted
12 modeling assumptions that would apply to both the
13 reference home and the rated home. And the
14 software would apply these correctly, as well.

15 Next slide. For Title 24 compliance
16 there's no need to look at utility rates. But
17 HERS tools we do need to look at utility rates.
18 So the HERS models would have to include the
19 capability of calculating annual electricity and
20 gas consumption based on the utility rate that's
21 in effect for the homeowner.

22 And so this slide lists the features of
23 the utility rate that would have to be -- that the
24 tool would have to be able to model correctly.
25 One of them are seasonal variations in the price

1 structure. This is very common for gas rates, for
2 instance. You pay a higher price in the winter
3 than you do in the summer.

4 Tiered rates. Many of the utility
5 electric rates have what's called a lifeline or
6 other tiers where you pay one price per kilowatt
7 hour for the first 500 kilowatt hours for that
8 month. And then for the next 500 kilowatt hours
9 you pay another price. And for the next 500 you
10 might pay another price.

11 So the tool has to be able to
12 accommodate tiered rates. It has to also be able
13 to accommodate monthly services charges.

14 And the last three are not that common
15 for residential rates, but they're becoming more
16 common, especially for homes that use photovoltaic
17 systems. The first one are demand charges, where
18 you pay one price for electricity consumption in
19 kilowatt hours, but then you pay -- there's a
20 second charge based on your maximum demand for
21 that month in kW. Almost all commercial rates
22 have this feature, and some residential rates have
23 it.

24 Then the next one are time-of-use
25 charges. Time-of-use charges are also quite

1 common for nonresidential rates. And they're also
2 quite common for residential systems that have
3 photovoltaic systems. With time-of-use the year
4 is divided into three parts. It's divided into an
5 onpeak period, which typically is noon to 6:00
6 p.m., in the summer. There's an offpeak period
7 which is most of the winter and the middle of the
8 night in the summer. And then there's the
9 shoulder period, which is kind of intermediate
10 period between the onpeak and the offpeak.

11 And the price per kilowatt hour varies
12 depending on when you use it. The reason this is
13 important for photovoltaic systems is that they're
14 typically are generating electricity when the
15 price is high. And so it's a benefit to the
16 homeowner to use a time-of-use rate if they have a
17 PV system.

18 But they might also have it on a
19 conventional home. So this is something that
20 would have to be modeled.

21 And then the third feature is a
22 ratcheted rate. And this is similar, but slightly
23 different, from the tiered rate. So these are the
24 capabilities that the utility rates model would
25 have to have.

1 Next slide. One of the most significant
2 additions that we're making through the HERS
3 technical manual and the HERS program to the Title
4 24 modeling rules is the addition of a model for
5 lighting and appliances energy.

6 As we mentioned, the California
7 standards have only dealt -- and really only, when
8 you do your MICROPAS run or your ENERGYPRO run for
9 a residence in California, the numbers that come
10 you include heating, cooling and water heating.
11 But they don't include lights or appliances or
12 refrigerators or any of these other things.

13 These things are -- it's pretty
14 important that the HERS rating include these
15 things. And we're going to talk next about how
16 this happens.

17 This pie chart at the bottom shows how
18 big, I mean heating is 18 percent, cooling is 7
19 percent, water heating is 15 percent. So all
20 total, that's right around 40 percent of the total
21 energy use that's actually addressed by Title 24.
22 The other 60 percent is -- we're proposing to
23 bring into the fold, with this rating program.

24 I know your pie charts were slightly
25 different, but these came from the RASS data, from

1 the residential appliance saturation survey.

2 So, for the next part of this we're
3 going to kind of run through how we propose to
4 account for the lighting and appliances energy.

5 Next slide, please. One of the things
6 we need to do is adopt a schedule of operation
7 because when we're dealing with time-dependent
8 valued energy, you have to know what time the
9 energy is used.

10 And so these -- I apologize that you
11 can't read it, Pat's up there squinting his eyes,
12 and even --

13 (Laughter.)

14 MR. ELEY: But refrigerators are
15 assumed to run constantly, so just, you know, we
16 don't factor in cycling. We have -- actually, go
17 to the next slide, it'll be easier.

18 So on this slide the dark blue line is
19 lighting, interior lighting energy. And this
20 curve basically follows the data and data that was
21 developed by Hescong Mahone Group in '99, I
22 believe, as part of a lighting assessment study.

23 Outdoor lighting we're assumed comes on
24 four hours each night. That's the purple one
25 that's flat, and then it jumps up for four hours

1 in the evening.

2 People is kind of a valley during the
3 day with a little peak in the afternoon, and
4 equipment energy and so forth.

5 So these, the derivation of these
6 schedules, again, is discussed and explained in
7 the topic report. So we won't get into it in a
8 great -- in a lot of detail here.

9 But the important point I want to make
10 here is that with the HERS program, as we're
11 proposing it and using time-dependent valued
12 energy, we've got to know more than just the total
13 amount of electricity that's used. We need to
14 know when it's used. And that's why these
15 schedules are important.

16 The next slide, please. So,
17 refrigerators, we're proposing that there be a
18 credit in the HERS program for energy efficient
19 refrigerators. The refrigerator in the reference
20 home would be fixed at 775 kilowatt hours per
21 year. And that's the same number that's used in
22 the RESNET program.

23 The rated home would use the energy
24 number that's reported on the energy guide labels.

25 Would you go to the next slide, please.

1 You've all seen this energy guide label. Since
2 about 1989 most -- all refrigerators have been
3 rated through the USDOE procedure. So, we know
4 what their estimated kilowatt hours per year are.
5 It's right on this label. So that number would be
6 used for the rated home. And if it's lower than
7 775, there would be a credit to the home.

8 Go back, please. Now, in some instances
9 the rater may observe that there's a second
10 refrigerator out in the garage, or some other
11 place.

12 MR. SPEAKER: With one six-pack of beer
13 in it.

14 (Laughter.)

15 MR. ELEY: Yeah, with one six -- yeah,
16 that's right. Now, when the rater makes that
17 observation, then additional energy is added to
18 the rated home, but not the reference home. And
19 the additional energy that's added is shown by
20 that equation at the bottom. Minus 50 plus .717
21 times the CFA. CFA stands for conditioned floor
22 area of the home.

23 Now, this equation, this form of the
24 equation you're going to see a lot of as we go
25 through this next few slides. It's the classic

1 a-plus-bx kind of equation, where b is the slope
2 of the line and a is the intercept of the line.
3 In this case the intercept is negative at minus
4 50.

5 Now, the derivation of these a-plus-bx
6 types of equations all come from the California
7 residential appliance saturation survey. So,
8 we've gone through and looked at those data. And
9 this equation explains the additional electricity
10 use of that second refrigerator pretty good. the
11 r-squared regression coefficient was 98 or
12 something. I don't remember exactly what the
13 number was.

14 MR. BACHAND: Can I ask a clarifying
15 question? Any refrigerating device or
16 refrigerator, or is a freezer different from a
17 refrigerator?

18 MR. ELEY: The question was from Mike
19 Bachand, is any refrigerator or freezer. We need
20 to clarify that. I don't think we're clear about
21 that. But, I think either one would, in my
22 opinion, should count towards this penalty.

23 MR. CONLON: Go back to RASS and the
24 definition of a refrigerator in RASS.

25 MR. ELEY: Yeah, we can do that. They

1 didn't have freezers in there, second freezers.
2 But I know there are some hunters still in
3 California, so there's probably some --

4 (Parties speaking simultaneously.)

5 MR. ELEY: That was Tom Conlon that made
6 that comment.

7 MR. CONLON: Tom Conlon. Go back to
8 RASS is what I said.

9 MR. ELEY: Okay. Move ahead two slides,
10 please. All right, this is just a diagram of --
11 just to get an idea of the refrigerators on the
12 market, this is a histogram of all of the
13 EnergyStar refrigerators listed as of about a year
14 and a half ago, or year, 16 months ago.

15 And you can see that there's quite a
16 number of models that are available that use less
17 than 775 kilowatt hours a year. So this is
18 something where there could be some credit.

19 Next slide, please. Okay, now
20 dishwashers is the second area where we're
21 proposing to offer a credit for an efficient
22 appliance. The assumption here is that the
23 refrigerator and the dishwasher say with the
24 house. And we're rating the house, not the
25 occupants. I know that's not always the case, but

1 that's the assumption we're making in this
2 particular instance.

3 Clothes washers and dryer, as you'll see
4 in a minute, we're assuming do go with the
5 occupants and there's no credit for that for
6 efficient models, although the energy use is
7 accounted for.

8 Energy dishwashers are rated by USDOE in
9 terms of an energy factor. And the energy factor
10 is the -- what is it, the number of loads you can
11 run with one kilowatt hour or something like that.
12 I don't remember the exact definition. But, so
13 we're using this equation down after the fourth
14 bullet, electricity for the dishwasher equals .27
15 times the cycles per year, divided by the energy
16 factor. Now, this equation again was taken from
17 the RESNET manual, so that we're consistent with
18 RESNET.

19 Now the energy that a dishwasher uses
20 consists of two parts. It consists of the
21 electricity that the dishwasher directly uses, but
22 the energy use also is the hot water that arrives
23 at the dishwasher from the water heater. Now,
24 this equation is only accounting for the first
25 part of that, not the second part. The hot water

1 use being delivered to the dishwasher is accounted
2 for in a separate calculation of hot water use.
3 So we're just talking here about the electricity
4 component.

5 Next slide, please. So, depending on
6 the number of bedrooms in the home, the HERS
7 manual specifies the number of cycles per year for
8 the dishwasher. So if it's a three-bedroom home,
9 the estimate is 247 dishwasher cycles per year.
10 If it's a five-or-more bedroom home, it's 345
11 cycles per year.

12 So this table is included in the HERS
13 technical manual. And again, this table is
14 consistent with the RESNET national standards.

15 So the credits that we're proposing to
16 offer for dishwashers and refrigerators are
17 identical to the credits that the RESNET national
18 standard offers.

19 Next slide, please. If you look at
20 EnergyStar dishwashers, there's a whole bunch of
21 them that are just a little bit more efficient
22 than the DOE standard, and would qualify for
23 credits. But then after that it drops off and
24 there's not many out there. So there's quite a
25 number of models that would earn the credit, but

1 we're not going to see energy factors much higher
2 than .65 to .7; that's about the limit of where
3 we're going to see.

4 Next slide. Okay, now for clothes
5 dryers if the rater observes that there's a
6 clothes dryer in the house, or if the rater
7 observes that there's a hookup and a space for a
8 clothes dryer in the house, then the electricity
9 and/or gas use of the clothes dryer is included.
10 But the same number is included in both the rated
11 house and the reference house, so there's no
12 credit.

13 Here we're assuming the clothes dryer
14 does leave with the occupants. And, again, this
15 is an assumption consistent with RESNET. So here
16 are these a-plus-bx type equations again. The
17 electric dryer, according to RASS data uses 263
18 kilowatt hours per year plus .25 kilowatt hours
19 for each square foot of house. And the dryer is
20 13 therms a year plus .01 times the CFA.

21 Next slide. So there's a similar
22 approach with clothes washers. If a clothes
23 washer is present in the rated house, or there's a
24 space for one and a hookup for one, then the
25 energy in this equation is added to both the

1 reference house and the rated house. But, again,
2 there's no credit. It's just put in there so that
3 we're accurately estimating the total electricity
4 and gas use of the home.

5 Next slide. For ovens and ranges, if
6 there's an electric range or oven then the annual
7 consumption is assumed to be 92 kilowatt hours
8 plus .118 times CFA. Again, these data, these
9 equations, come from regressions against the RASS
10 data.

11 If the rated home has a gas range or an
12 oven, then the energy consumption is 31 therms per
13 year plus .008 times the CFA. So the gas range is
14 not that sensitive, as you can see, to floor area.
15 It's running right around 31 therms per year.

16 Next slide. So miscellaneous energy use
17 is everything else except for the things we've
18 covered, and also interior lighting which we're
19 going to get to next. So this is the stereo
20 system; this is the tv's, you know, all the
21 electric appliances. This is also toasters and
22 Cuisinarts, and you know, other appliances around
23 the kitchen that weren't explicit but are not the
24 range oven or the dishwasher or the clothes
25 washer.

1 So this is a pretty big number actually.
2 This is 1650 kilowatt hours per year plus .41
3 times the floor area. And, again, this is from
4 the RASS data. And this number would be applied
5 to both the reference house and the rated house,
6 so there would be no credit.

7 Next slide. Okay, this is kind of
8 smallish; we probably should have broken this into
9 two lines, but the RASS data indicates that
10 interior lighting in homes is 214 kilowatt hours
11 per year plus .6 kilowatt hours per year times the
12 CFA and floor area. So that's the base usage.

13 So what we're doing with the rest of
14 this equation is we're modifying this depending on
15 something called the power adjustment multiplier.
16 The power adjustment multiplier accounts for light
17 controls such as occupant sensors; and it also
18 accounts for high efficacy luminaires such as
19 compact fluorescents or LEDs or full-size
20 fluorescents, full-length fluorescents.

21 Now, so there is a credit being proposed
22 here for rated homes that have more efficient
23 lighting than the reference house. And there
24 would also be a penalty for rated homes that have
25 less efficient lighting than the reference house.

1 Next slide. One of the things that the
2 rater would need to observe is the number of
3 hardwired fixtures in the home. So this is just a
4 simple count of so many hardwired fixtures.
5 Hardwired fixtures are those that are permanently
6 mounted in the wall as a sconce or on the ceiling
7 or in some other place, as opposed to portable
8 lighting which are desk lamps, floor lamps and so
9 forth.

10 Now, based on that number, which is F in
11 this equation, the fraction of portable lighting
12 is determined. It's going to be -- the fraction
13 of portable lighting in terms of watts is going to
14 be right around one-fourth of the total. But it's
15 going to vary a little bit depending on how many
16 hardwired lighting fixtures there actually are in
17 the rated home.

18 Next slide. The power adjustment
19 multiplier takes into account the type of control
20 and the type of fixture. So, the power adjustment
21 factor for a high efficacy fixture would be .33.
22 It would be expected to use only a third of the
23 energy of an incandescent lamp.

24 So the HERS technical manual lays out
25 the power adjustment multipliers for various

1 fixtures and various controls. And the power
2 adjustment factor multiplier for all of the
3 interior lighting is simply the weighted average
4 or the summation of the power adjustment
5 multipliers for all the individual lamps in the --
6 or fixtures in the home.

7 It's not as complicated as they seem to
8 you at this point. We've actually implemented
9 this in an Excel spreadsheet with drop-down menus,
10 and it's very easy to get through.

11 What the rater is going to have to
12 observe when they go into the house is the number
13 of hardwired fixtures. And then for each
14 hardwired fixture they'll need to decide if it's
15 an incandescent, or if it's a screw-in
16 fluorescent, or if it's a permanent fluorescent.
17 They have to make one of those three calls.

18 Then they had to decide how that
19 luminaire is controlled. And there's, I think
20 there are three choices there. The on/off switch,
21 occupant sensor and dimmer.

22 So it's really not that hard for the
23 rater, but what I'm showing you with these
24 equations is how this comes into the fold.

25 Now, the Title 24 standards require high

1 efficacy luminaires in kitchen and in bathrooms
2 and there's exceptions for occupant sensors and so
3 forth.

4 So we've gone through the calculation
5 and determined that for a home in minimum
6 compliance with Title 24 that the power adjustment
7 factor is .625. So that number will always be
8 used for the reference home. And the rated home
9 will then use a number higher or lower than that,
10 depending on what the rater observes. Okay?

11 Next slide. So for exterior lighting
12 it's a very similar equation but a little simpler
13 because there are no portable exterior lighting,
14 at least that we're considering here. We're
15 assuming that all exterior lighting is permanently
16 attached to the building.

17 So that fraction of portable lighting
18 part drops out of this. And the equation just
19 becomes minus .81 times .15 times the CFA, and
20 that's times the power adjustment multiplier.

21 Next slide, please. And the power
22 adjustment multiplier for exterior lighting is
23 calculated pretty much the exact same way as it is
24 for interior lighting. It's the summation of the
25 power adjustment multiplier for the fixture and

1 the control for that fixture times the hours times
2 the number of that fixture. And then the whole
3 thing's divided by the hours times the count.

4 So this results in the power adjustment
5 factor for the rated home; the power adjustment
6 multiplier for the reference home is fixed at .49.
7 And, again, that's by looking at the Title 24
8 standards that mostly require high efficacy
9 luminaires for all outdoor lighting applications.

10 The reason it's not all the way down to
11 .33 is that garage lighting is included in the
12 category of outdoor lighting here. And garage
13 lighting can actually have an occupant sensor and
14 an incandescent. I think that was factored into
15 the mix here.

16 Next slide. So, the internal gain is
17 all the heat that's produced by lights and
18 occupants and people and appliances. And in Title
19 24 calculations this is specified as a function of
20 the floor area.

21 In the HERS calculations it's going to
22 fall out of the lighting and appliances model. We
23 know how much electricity is being used now for
24 refrigerators and dishwashers and miscellaneous
25 and lighting and so forth. So we can convert that

1 directly into internal gains.

2 But we would add heat gain for occupants
3 at the rate of 4140 Btus per person; and that's
4 based on a typical heat gain rate of 230 Btus an
5 hour per occupant. We're assuming they're in the
6 house 18 hours a day. So that's where that 4140
7 comes from.

8 Now, most of the heat that's produced by
9 the appliances goes directly into the space, but
10 not all of it. Heat that's produced by the dryer,
11 for instance, much of that is exhausted. So only
12 30 percent of the dryer energy is assumed to
13 manifest itself as heat gain.

14 And now I'm looking at that table at the
15 bottom; 90 percent of the heat produced by the
16 oven and the range manifests itself as heat gain
17 within the house. And, of course, none of the
18 exterior lighting is heat gain. And everything
19 else is all 100 percent, the refrigerators,
20 interior lighting, that's all 100 percent.

21 So, the internal heat gain assumption in
22 the Title 24 standards for compliance would be
23 modified and replaced by the electricity and gas
24 consumption being estimated by the HERS lighting
25 and appliances model.

1 Next slide. The next variation in Title
2 24 modeling assumptions that I want to talk about
3 is the -- are uninsulated wall cavities. Here
4 we're talking about wall and ceiling
5 constructions, not floors.

6 And when utility bills for rated homes
7 have been compared against the estimates of Title
8 24 calculations there's often been a big variance.
9 And the variance is greatest for homes that are
10 uninsulated.

11 And from our research it appears that
12 the estimated heat loss from U factors of
13 uninsulated walls and ceilings over-estimates what
14 the actual heat loss is. And these arguments are
15 presented in the HERS technical manual. I'm not
16 going to go into it at length now.

17 But the bottomline is that for -- we're
18 recommending that for existing homes that at least
19 R4 insulation always be assumed. And R4
20 insulation translates into a U factor of .25. So
21 that -- and this, from the research we believe
22 that this will close one of the big gaps between
23 the estimates of energy consumption produced by
24 simulations and actual utility bills.

25 Next slide, please. We're also

1 proposing a few variations in terms of
2 infiltration. The default infiltration rate for
3 existing homes is 4.9 SLA. SLA is specific
4 leakage area. And it represents the leakage per
5 unit of floor area.

6 We're recommending that that get reduced
7 to 4.4 if the ducts in the existing home are
8 sealed. So this is a reduction of .5. And that's
9 the same reduction that you have with new homes.
10 The new homes are shown in the column to the left;
11 it drops from 4.3 to 3.8, again a .5 reduction.

12 And if there are no ducts in the home it
13 would drop from 4.9 to 3.8, a reduction of 1.1.
14 And, again, that reduction is consistent with the
15 reductions in new homes. So, this is a slight
16 modification of the infiltration tables in the ACM
17 which set everything in 4.9, ducts or no ducts.

18 Now, there's another little twist to
19 this. The 2008 energy efficiency standards
20 required mechanical ventilation in all residences.
21 And this is now a mandatory requirement.

22 So if the rater goes to a home and does
23 a pressurization test to measure the specific
24 leakage area, if they want to use a specific
25 leakage area lower than the defaults shown in the

1 column on the right, then mechanical ventilation
2 would have to be installed in the rated home.

3 So, the rule is that you can't use the
4 results of measured infiltration in the rating
5 unless the home has mechanical ventilation system,
6 meaning the requirements in the standard. The
7 typical solution for providing -- for meeting the
8 mechanical ventilation requirement is a quiet,
9 continuously operating exhaust fan, usually in the
10 bathroom but it's wired to run continuously, and
11 it's not switched at the wall.

12 If infiltration is measured in the
13 existing home, then it would be measured according
14 to the standards reference appendix RA3, and that
15 has -- actually I think that just references the
16 ASTM blower door test procedure.

17 Next slide. Okay, continuing on the
18 issue of mechanical ventilation, the most common
19 situation that a rater is going to face in an
20 existing home is that there's no mechanical
21 ventilation. Very few existing homes are going to
22 have mechanical ventilation that's going to
23 qualify, that's going to meet the requirements of
24 the 2008 standard.

25 So, in this case both the rated house

1 and the reference house would be modeled with
2 mechanical ventilation, even though the rated
3 house doesn't have any. So it would be a wash;
4 there would be no credit, no penalty, they would
5 both be rated with the -- the energy use would be
6 calculated with the existence of a minimum
7 complying mechanical ventilation system.

8 Now, if the rater goes to the house and
9 the rater finds a mechanical ventilation system,
10 then the rater would need to collect data on that
11 mechanical ventilation system, including the fan
12 volume, the fan power and the schedule of
13 operation in the event that it's not programmed to
14 just run continuously.

15 The ventilation requirements actually
16 allow fans to be run intermittently if they bring
17 in a higher ventilation rate during the shorter
18 period of time when they're operating.

19 So, mechanical ventilation would be
20 accounted for in the rating procedure. There
21 would not be a penalty for not having it. There
22 could be a credit for having it if the fan were
23 especially efficient. So, it's got one of these
24 situations where you can win, but you don't
25 necessarily lose.

1 Next slide. So, the ancillary energy
2 uses are pools, spas, well pumps, grinder pumps,
3 that sort of thing. Those would not be calculated
4 in the HERS index, but an estimate of their energy
5 use would be included in the estimate of annual
6 energy use and operating costs. That was down in
7 the lower corner of the HERS report that you saw
8 this morning.

9 So, we're not proposing a real
10 sophisticated model for calculating this. It's
11 just a table here. So, for instance, if you have
12 a gas-heated swimming pool with a cover, that's
13 heated by gas, you add another 352 therms of gas
14 use. If it's heated by electricity, god forbid,
15 it would be 2671 kilowatt hours of electricity
16 use.

17 So, these numbers would just be added in
18 so that at least they're in the ballpark for these
19 big energy users like swimming pools, spas, well
20 pumps and grinder pumps.

21 Next slide. And this shows the
22 schedules for pools and spas where for pools
23 basically the filtration pumps are assuming to run
24 for about eight hours a day, six to eight hours a
25 day.

1 MR. SPEAKER: Not 24?

2 MR. ELEY: No. If they do run 24 the
3 HERS rater ought to -- and then spas, the pumps
4 are assumed to run mainly in the early evening for
5 about four hours. So those are the schedules that
6 would be used.

7 Next slide. Now if the rater observes
8 that there's a photovoltaic system on the rated
9 home, then the procedure to use to calculate that
10 contribution is the same procedure that's used in
11 the Energy Commission's New Solar Homes
12 Partnership program.

13 This is the five-parameter method; it's
14 documented in appendix B of the 2008 residential
15 ACM approval manual. There's also a computer
16 program, what's it called, PV --

17 MR. PENNINGTON: CEC PV.

18 MR. ELEY: -- CEC PV. That's free to
19 use, and probably what most software developers
20 developing the HERS tool would do, just take that
21 software component and put it into their tool.

22 Next slide. Oh. Any comments on
23 modeling rules.

24 MR. SCOTT: Robert Scott with CHEERS.
25 Going back to the reference home, first of all I

1 think one of the good things that's come out, not
2 everything has been done according to RESNET,
3 RESNET done some things according to California.
4 I would say that one of the tests that they
5 applied was for testing their reference house.
6 And that was at the behest of a lot of folks from
7 California. Just wanted to say that.

8 But, again, I'll get back to the
9 question. I think it would be important to define
10 stability over time and saying what does that
11 reference house represent. And I think inside the
12 technical manual there are references to Title 24
13 2008, you know, new homes of this. As this goes
14 into the 2011 are we going to change it again? So
15 I just want to bring that point again.

16 Talked a little bit about utility rates.
17 For CHEERS we've implemented an entire set of
18 utility rates before in terms of how we handle
19 that. I think it's important to realize where we
20 get those rates, how they're updated, even some
21 standardization of what they look like so we're
22 consistently using them. Because that then
23 governs the utility cost and energy savings that
24 will have a great impact on what we're doing.

25 Let's talk about appliance TDV energy.

1 I'm assuming that what we were seeing here were
2 some of the calculations, the TDV is embedded in
3 those factors. I don't know.

4 MR. ELEY: No, no, those equations that
5 you saw just give kilowatt hours per year or
6 therms per year. But converting it to TDV energy
7 if the schedule is fixed is just a multiplier.
8 It's a very straightforward process. That's
9 documented in the topic report, I believe.

10 MR. SCOTT: Okay, and so again going
11 back to cost effectiveness tests, will cost
12 effectiveness be based in the standard
13 recommendations only for based on TDV energy
14 rates? But custom --

15 MR. ELEY: Custom you use utility rate
16 the customer sees.

17 MR. SCOTT: No, I'm talking about energy
18 consumption.

19 MR. ELEY: Oh.

20 MR. SCOTT: Energy use.

21 MR. ELEY: The same. The model that I
22 showed you just gives kilowatt hours or therms per
23 year. And also has a schedule.

24 MR. SCOTT: Okay.

25 MR. ELEY: So, the model basically

1 produces an 8760 time series of electricity or gas
2 use for each appliance. And from that data you
3 can apply the TDV multipliers, or your utility
4 rates or whatever.

5 MR. SCOTT: So they'll be on both sides
6 of that.

7 MR. ELEY: Correct.

8 MR. SCOTT: Okay. And then one last
9 thing on that one section, page 29 where there's
10 another thing here. It's just a semantical issue.

11 MR. PENNINGTON: Page 29 of what
12 document?

13 MR. SCOTT: 29 in the technical manual.
14 it's 4-10 where it says -- and it was on the slide
15 back in there, as well, where it talks about the
16 rated home, it has mechanical ventilation system.
17 The home inspector shall collect data. I just
18 thought that maybe you want to say that the data
19 collected shall be, because all of a sudden we've
20 used home inspector out of the blue, nothing
21 against home inspectors, but I just think --

22 MR. SPEAKER: The data collector.

23 MR. SCOTT: -- the data collector.
24 That's my part of the putting it into the grader.

25 MR. PENNINGTON: We only made one

1 mistake in the writeup, that's --

2 MR. SCOTT: Only one mistake.

3 (Laughter.)

4 (Pause.)

5 MR. ELEY: Thank you, Robert. Yes.

6 MS. MURPHY: Hi, Linda Murphy from
7 Heschong Mahone Group. I want to reiterate the
8 question actually that Rob continues to ask, and
9 that is, is the reference house going to change
10 from code year to code year. Because it doesn't
11 seem like that would be a -- it seems like you'd
12 have a different set of rules for each rating, you
13 know, when each code year came by. So it would
14 seem like that you would want to stick with the
15 reference house being at a certain year, and then
16 go from there.

17 I mean because otherwise then the
18 ratings become watered down from year to year.
19 You don't know what you're referring to as far as
20 a zero, or a 25 house versus, you know, it built
21 in 2012 versus, you know, one that was built in in
22 today's, using today's standards.

23 So it's like -- I think that reference
24 house has to stay a reference house for a number
25 of years; it can't change from code year to code

1 year to code year.

2 MR. PENNINGTON: Just to react to that,
3 I think there's a tension between the desirability
4 of having the rating stay put in terms of the same
5 reference for quite a period. With the notion
6 that we need to rapidly change the quality of our
7 houses over the next decade, two decades, related
8 to climate change, and --

9 MS. MURPHY: I would understand that,
10 but at the same time if I'm a homeowner and I get
11 a rating on a house this year --

12 MR. PENNINGTON: I wasn't finished with
13 my comment, but --

14 MS. MURPHY: Sorry.

15 MR. PENNINGTON: -- that's just kind of
16 a reference. RESNET, for example, held their
17 rating scheme constant for ten years. And then at
18 that time felt that their rating scheme was so
19 obsolete relative to what the goals were that they
20 reconsidered and changed.

21 And I think there will constantly be
22 some tension about that. I think the Energy
23 Commission will adopt these requirements based on
24 2008. And this Energy Commission cannot prejudge
25 what might happen, you know, ten years from now

1 with another Commission, another five Members of
2 the Commission.

3 MS. MURPHY: Too bad.

4 (Laughter.)

5 MR. PENNINGTON: Yeah, and so, you know,
6 it's kind of an open question. At some point in
7 time undoubtedly the issue will come up, and the
8 Commission will have to address it. I think it's
9 a good comment that there's value in having the
10 rating stay put at least for a period of time.
11 So, appreciate the comment.

12 MS. MURPHY: Thank you. My second
13 question is I'm assuming that all this is pretty
14 much totally referring to low-rise residential
15 standards, is that correct?

16 MR. PENNINGTON: Um-hum.

17 MS. MURPHY: So, is there anything in
18 the works to deal with high-rise residential,
19 condominiums and townhomes which are also there's
20 a lot of those existing around the world. I
21 didn't know if you were going to address those at
22 any given point in time.

23 MR. PENNINGTON: Well, we're trying to
24 get this system in place, and low-rise residential
25 is the first bite here, for sure. It makes sense

1 for the Commission to come back and look at high-
2 rise residential in the future.

3 MS. MURPHY: Thank you.

4 MS. McCOLLOM: Elizabeth McCollom with
5 Heschong Mahone Group. Building off of Linda's
6 last question, for multifamily projects are we
7 going to model this per dwelling unit, I assume?
8 Or by building? Because at point of sale you're
9 going to need per dwelling unit, point of permit
10 you may need by the building.

11 And if we model by dwelling unit, what
12 do you do when you come across central water
13 heating systems and that sort of thing.

14 MR. ELEY: Well, I don't think we
15 addressed that. My view is that the rating system
16 could work either way. In the case of a water
17 heating system that serves multiple units, I think
18 there -- we added some language to the 2008 water
19 heating calculations on how to prorate the energy
20 use between dwelling units based on gallons per
21 day of consumption. So there's a simple way to do
22 that.

23 But I think the rating could apply to
24 the whole apartment building or it could apply to
25 an individual unit, either way.

1 MS. MCCOLLOM: Thank you.

2

3 MR. MAEDA: Bruce Maeda, Energy
4 Commission Staff. I think initially we're going
5 to probably do it by the building, even though,
6 you know, I debated that thing, myself, at our
7 staff meetings.

8 But because essentially the standards
9 are done by building, also because when
10 multifamily units are sold they're usually sold as
11 a building and not as -- except in the case of
12 condos.

13 MR. ELEY: Well, not always.

14 MR. MAEDA: Yeah.

15 MR. NESBITT: George Nesbitt. We need a
16 little checkbox for the plasma tv, and then a
17 second one for one in every room. I've been to
18 those houses.

19 In some cases we'd have actual data from
20 testing or from appliance databases on certain
21 pieces of equipment, and wouldn't it be more
22 appropriate in that case if we got the second
23 fridge or the freezer, and both of those are in
24 the 2004 RASS, which is a wealth of information if
25 any of you haven't dug into that, rather than

1 making assumptions. Home Energy has an incredible
2 database on fridges and freezers. You can hone it
3 down pretty close with model numbers.

4 The other thing is on the output end of
5 the modeling, it would be nice -- in MICROPAS I
6 can get, well, site energy as well as source
7 energy, as well as -- yeah, I think I can get all
8 three by end use, or at least by interpretation.

9 And it would be nice to also be able to
10 get data out at time-of-use, you know, for us
11 energy geeks that want to look at that. You know
12 exactly what's going where. And also monthly by
13 end-use. ENERGYPRO does, I guess, currently give
14 you kWh and therms by month, but not broken down
15 by any uses. It just gives you a total. So you
16 don't know how much it adds water heating or space
17 heating, although you can do -- and get some of
18 that.

19 California has the most robust
20 calculation method, by far, as Ken Miller has
21 reminded me, from MICROPAS. You know, we're going
22 to slowly get there, especially with what we're
23 doing as part of this process, and make it even
24 better.

25 On the utility rates obviously we'll be

1 inputting what utility and what rate schedule.
2 And so part of the rating cost projection, I'm
3 still not clear if -- I mean that cost projection
4 has to be off of the site energy, because your
5 bill gets charged off of the site energy. But
6 you've also ended up throwing out TDV as part of
7 the cost calculations. So I don't see how you
8 could calculate the cost base off of the TDV
9 values. So if you could clarify that, that'd be
10 great.

11 MR. ELEY: Well, the model is going to
12 produce hourly estimates of TDV energy,
13 electricity energy, gas energy. TDV is just a way
14 to consolidate gas and electricity.

15 So, the utility rate model would not
16 rate from TDV energy, it would use the hourly
17 electricity consumption data, or the gas
18 consumption data, if it was a gas rate.

19 MR. PENNINGTON: You're going to be
20 covering this a little bit more, Charles, in
21 upcoming presentations?

22 MR. ELEY: I will, yeah.

23 MR. NESBITT: It's just without knowing
24 what each of those hours are, and what the TDV
25 value is, I have no way of calculating back to

1 source energy or site energy, right? It's no
2 longer simple like the source energy --

3 MR. PENNINGTON: I don't think we have
4 much of a problem here, I think we can deal
5 with --

6 MR. NESBITT: -- electricity was 3 and
7 gas was 1.

8 MR. PENNINGTON: -- your concerns.

9 MR. NESBITT: Yeah, just it -- okay.

10 MR. BACHAND: Mike Bachand, again. I
11 don't think you can -- how should I say, cavalier
12 with the multifamily versus the single family.
13 The whole building approach of modeling for
14 multifamily is confusing right now in the 2005
15 standards, and maybe in the 08's, too, I'm not
16 sure yet.

17 But for instance, one of the things that
18 makes a difference is in modeling a whole
19 building, if they're condominium or single family
20 ownership, modeling that whole building doesn't
21 make sense because each one of the users in there
22 has a different lighting exposure, different
23 personal habits, different utility bills. Not
24 everything spreads across those buildings.

25 In those cases the water heater probably

1 is individualized and not spread across. But in
2 the case where a multifamily building has one big
3 old water heater for everything, but each unit has
4 a fan coil air conditioning system in it, then the
5 usage in there is much different and that doesn't
6 equate to the whole building process at all. I
7 think that should be looked at with much more -- I
8 don't think you can just cut-and-paste those
9 paragraphs across that. I don't that is
10 realistic.

11 MR. CONLON: Tom Conlon, Energy Checkup,
12 Geopraxis. Just to follow up on the multifamily
13 point, since that's on the floor, that is a
14 significant issue. And I was curious to note that
15 the RASS data you are using is single family
16 specific RASS or is it --

17 MR. ELEY: No, no, we looked at -- It's
18 mostly single family, but it includes townhomes
19 and apartments, even mobile homes. We dropped out
20 the mobile.

21 MR. CONLON: Okay. So if the decision
22 is made to go with that as the basis, then we
23 would be essentially benchmarking the multifamily
24 units, I guess, to emerge multifamily and single
25 family data set that is that generic RASS.

1 So I would underscore that comment then
2 about the whole building approach. Maybe need to
3 take another look at that if we're going to maybe,
4 at this stage, eliminate whole building analysis
5 as an approach. It might take more discussion to
6 do that.

7 I'm concerned about the 2500 square foot
8 reference, the maximum that's been proposed.
9 Mostly from a perspective that I think it will
10 draw a lot of attention and debate from groups
11 beyond this room.

12 I don't know if it is necessary to do
13 that. And so I'm trying to understand what we're
14 trying to get at here in establishing a reference.
15 I agree with the comments from the floor about
16 there needing to be some sense of stability over
17 time. And for me that is achieved by having zero
18 be the objective of the index. And that's what's
19 going to remain stable over time.

20 So, as I think about it, we're simply
21 providing a benchmark when we suggest a reference
22 house. And you could actually model this in such
23 a way that you show, here's the reference house
24 for the year in which your building was built.
25 And here is how you compare. And right now it's

1 the 2008 code, it could also be issued as a
2 benchmark point of reference for comparison.

3 So, that's -- I realize the modeling
4 would be very complex to put into the software --

5 MR. ELEY: Proposing a separate
6 reference house to being when the home --

7 MR. CONLON: What I'm proposing is
8 analytically, from the perspective of comparison.
9 If the goal is to provide a meaningful means of
10 comparison to the consumer, what's -- my house
11 built in 1986 was built under the 86 standards.
12 And so have I improved it based on that point in
13 time. That's what's meaningful to me selling my
14 house two years from now, or whenever I might sell
15 it.

16 And so I would be able to tell the story
17 to a buyer that I've done a better job since I've
18 moved into my house. So, --

19 MR. PENNINGTON: I just don't
20 understand, Tom. Why wouldn't you be able to show
21 that with an improved score?

22 MR. CONLON: I could show it with an
23 improved score, but I'm questioning in that
24 context the relevance of the 2008 envelope and
25 other code reference elements with the 2005 RASS

1 appliance elements kind of all merged together to
2 create this artificial reference we are currently
3 talking about.

4 It would be more meaningful to me,
5 trying to communicate this to a buyer, that, you
6 know, the house was built in 86; this is how it
7 performed -- it should have performed in 86. And
8 this is how it performs now as inspected by the
9 existing home data collector.

10 So, to simplify all of that obviously
11 messy complex process, I can imagine either the
12 zero index being the real focal point of such
13 comparison, and so all scores would be relative
14 simply to zero in terms of achieving the net zero
15 energy house.

16 And this 2008 reference house is really
17 almost an embedded -- for how does my house
18 compare to a new house that I can buy right now.
19 And you would need to change that every code
20 cycle, I think, to be true to that form of
21 benchmarking.

22 So, I would suggest that if we want to
23 put the 2008 based reference into the first
24 edition of this, that we do so with the
25 anticipation that we would update on the same code

1 cycle that we're already committed to for new
2 construction. And think of it as how does my
3 house, my existing house, compare to a new house
4 that I could buy down the street in a new
5 development.

6 I'm not sure if that's going to be --
7 how that's going to be received by the real estate
8 community who thinks their product, their existing
9 home product differentiating from a new
10 construction product.

11 So, I want to kind of think forward to
12 the challenges that might occur when we try to
13 explain why we've justified this benchmark around
14 the 2008 standard.

15 And another alternative proposal would
16 be to simply pick a point in time, perhaps the
17 1990 AB-32 point of reference, which our
18 greenhouse gas mitigation goals are built around,
19 and have that be the historic reference.

20 And that could become -- the codes that
21 we in place in 1990 could fill that same reference
22 function. We don't have probably -- we may have
23 RASS data for 1990. I think it may not line up
24 perfectly, I think there was a RASS done on a
25 utility-level basis around that time, may not have

1 been statewide. But those are my thoughts on that
2 topic.

3 I think I have a bunch of other things,
4 little picky things that I may just add into
5 written comments, thank you.

6 MR. PENNINGTON: Thank you.

7 MR. ZIGELBAUM: Nick Zigelbaum, Natural
8 Resources Defense Council. My question's about
9 the 2500 square foot cap that Tom mentioned as
10 well. Does that not advantage larger homes in
11 getting them slight, you know, that linear scale
12 doesn't seem like it would really capture the
13 difference in heating a 5000 square foot home
14 versus a --

15 MR. ELEY: It's quite the opposite.
16 Large homes are going to be penalized.

17 MR. PENNINGTON: Absent that kind of
18 cap, it becomes easier for larger homes to gain
19 energy per square foot --

20 MR. ZIGELBAUM: Because it's all based
21 on energy per square foot --

22 MR. PENNINGTON: -- the improvements --

23 MR. ZIGELBAUM: -- improvements. I see.
24 Thanks.

25 MR. SEGERSTROM: Charles Segerstrom,

1 PG&E. I think a great deal of care needs to be
2 taken with the scale in the tale that it tells. I
3 think we need to have national consistency, but
4 also something that moves the customer to take
5 action.

6 So to the extent that we have
7 inconsistency with national we end up with
8 problems. So the 2500 square foot needs to be
9 looked at carefully, because not only does that,
10 you know, bump the score in the wrong direction,
11 making it much higher; but, flip it around, as you
12 do home improvements you get more points per unit
13 of home improvement in that house, as well.

14 One of the problems with the national
15 scale that, you know, went from 100 being zero
16 energy to zero, is related to what the market was
17 looking for. The new construction dominance of
18 national rating programs didn't like only having
19 20 points to go after. Now they have 100. So
20 they have five times as many points per unit of
21 energy improvement.

22 Well, if we get orders of magnitude more
23 point improvement because we have stopped at 2500
24 then we may be sending the wrong message as to
25 what the actual energy improvements, you know,

1 will accomplish, possibly exaggerating the score
2 differential versus benefits, just as I feel has
3 been done in the RESNET scale.

4 So, the scale, you know, deserves very
5 careful consideration. It may take multiple
6 scales so that we are consistent nationally. I
7 know there have been discussions of performance
8 based tax credits on the basis of score
9 differential. Well, in that case we'd better have
10 a consistent score.

11 But we also might want to consider
12 what's been brought up earlier, something like a
13 Stars approach where if the consumer doesn't want
14 to take time to figure out all the nuances of
15 these somewhat wild scoring methodologies, the
16 simple pieces thereto.

17 I would also add that what's being
18 proposed is exactly the opposite of appliance
19 labels where the appliance label has, you know,
20 the worst scoring appliance on the right-hand side
21 of the bar, the best appliance on the left. And
22 what's being proposed is opposite.

23 So, lots of, you know, potentially some
24 consumer input as well as having the combination
25 of what moves consumers, but what stays consistent

1 nationally so we don't ace ourselves out of
2 programs on the basis of performance improvement.
3 Thank you.

4 MS. LAM: Okay, is no more comments then
5 we're going to move into the utility bill analysis
6 discussion and presentation.

7 MR. ELEY: Okay. Next slide, please.
8 So, the reason that we want to do this cross-check
9 from the energy model to actual utility bills is
10 to try and deal with lifestyle and behavioral
11 issues to some extent.

12 We know that the energy consumption
13 predicted by our models is going to be different
14 from the utility bills. What we want to do is try
15 and understand why they're different.

16 The California HERS tools, the
17 regulations require that those tools have the
18 capability of normalizing utility bills to typical
19 weather data that's represented on the CEC 16
20 climate zone files, so that the utility bills can
21 be compared. At least with this normalization we
22 can take out the climate variable, and we still
23 got all the occupant variables. But the climate
24 variable, at least, goes away.

25 The rating report for the utility bill

1 analysis would include these graphic
2 representations which we went over earlier. The
3 one for gas is shown up there in the lower right-
4 hand corner. And these would show not just gas,
5 but electricity and energy costs, as well.

6 Next slide. Loren Lutzenhiser was
7 mentioned earlier. This is a graph from one of
8 his ACEEE papers two years ago. And this shows
9 electricity consumption and the area under the
10 graph is the population, so this is like a
11 histogram.

12 So the mean is right around 6000
13 kilowatt hours per year per home, per dwelling
14 unit. But there's some dwelling units that use
15 three times that. And there's some that use half
16 of that. And these variations, some of which can
17 be explained by things that we're accounting for
18 in our model, like floor area and U factor and so
19 forth, but many of them are behavioral and
20 lifestyle issues.

21 Next slide. You can look at gas
22 consumption the same way. You know, the mean is
23 right around 400 to 500 therms per year per
24 household. But there's some homes that use three
25 or four times that, and a lot that use half or a

1 third of that.

2 Next slide. Sorry that this is so
3 small. But the point to be made here is that if
4 you look at those previous graphs and you divide
5 them up in terms of quartiles, and you look at the
6 top fourth quartile, those households are using an
7 average of 11,500 kilowatt hours a year. And in
8 terms of total residential consumption, that top
9 fourth quartile is using about half of the
10 statewide residential energy consumption. So
11 that's the one that where there's the greatest
12 opportunity.

13 Next slide. Loren also looked at what
14 he called lifestyle groups, you know, young
15 families, elderly families, and so forth. And
16 there's a huge variation here. You know, at the
17 top of the list is the low-income Hispanic couple
18 with a child using 3200 kilowatt hours per year.
19 And at the bottom is an older elderly couple,
20 they're not that old, my age --

21 (Laughter.)

22 MR. ELEY: -- who are using 9700
23 kilowatt hours per year. The seniors aren't shown
24 in here; I'm not quite in that category yet.

25 So, the point is that there's huge

1 variations here. The models -- there's always
2 going to be variations between models no matter
3 how accurate they are, in actual utility bills.
4 And we need to kind of understand those
5 differences as best we can.

6 Next slide. So what we're proposing,
7 we're proposing a technique, that a technique be
8 integrated into the HERS software tools called
9 inverse modeling. With forward modeling you enter
10 data about window areas and so forth, move forward
11 and out comes the results. With inverse modeling
12 you work backwards. You start with the results
13 and you develop a model that explains those
14 results.

15 So, this procedure is well established.
16 It's documented in an ASHRAE research paper. And
17 it's commonly used already in a number of software
18 programs, notably PRIZM, which is used in a lot of
19 utility programs. There's one called ETracker
20 that uses this technique, which is actually more
21 in the public domain. XNRGY has a program called
22 RECAP that uses this, and the utility websites
23 have online tools that use inverse modeling
24 procedures such as this.

25 The inverse modeling procedure that the

1 HERS tools would be required to incorporate would
2 have to operate in three different modes, heating
3 only, cooling only and heating and cooling.

4 So if you were analyzing a gas bill that
5 would be a heating only mode, because you'd be
6 looking at the climate variation of gas
7 consumption against heating.

8 The cooling only mode would be used for
9 an air conditioned home that had gas heating
10 because you'd be looking at just the electricity
11 side and the climate-dependent part would be just
12 the cooling. So you could separate that.

13 The heating and cooling mode would be
14 the more complicated situation. This would be,
15 for instance, an electric heat pump in a home
16 where you're going to be looking at variations in
17 electricity use due to both heating load and
18 cooling load.

19 The ASHRAE paper identifies several
20 different approaches. There's a four-parameter
21 change point model. And we're recommending that
22 that be used for the heating only and the cooling
23 only analyses.

24 But then there's a five-parameter change
25 point model that would be required when you have a

1 heat pump in a home, or where you have heating and
2 cooling both being provided by the same source of
3 energy.

4 In all cases the independent variable
5 could be outside air temperature. In this case
6 we're just looking at mean daily temperature,
7 which is something that's available from many
8 hundreds of climate locations in California.

9 Next slide. So if you were to look at
10 the gas consumption in a home and look at it on
11 each day, you plotted the average temperature for
12 that day against the gas consumption of that day,
13 you would get a line that looks a little bit like
14 the graph on the left.

15 As the temperature gets lowers the gas
16 consumption would go up. And you'd reach a
17 point -- do we have a pointer here -- so you'd
18 reach a point right here that's called the
19 inflection point. And that really represents the
20 balance point temperature in the space.

21 At that point it's cold enough that the
22 heating system comes on in the house. And as the
23 temperature gets colder it requires more and more
24 heat. This part of the line out here is usually
25 pretty flat, but there may be some climate

1 variation there, as well.

2 Now, if you look at the electricity used
3 in an air conditioned home on a daily basis, if
4 you were to plot it against the average
5 temperature for each day you'd get a graph that
6 begins to look like this. And this point right
7 here would be right around 80 or 85 degrees, at
8 which point you turn on your air conditioner,
9 right. And then as it got hotter your air
10 conditioning energy would go up.

11 So, what this inverse modeling does is
12 it calculated these data coefficients that are
13 shown on these graphs. And it does it based on
14 utility bill data and coincident temperature data.
15 It's actually a fairly simple and straightforward
16 process.

17 And what you have then is an inverse
18 model, or a model that would predict for a
19 particular home and the particular occupancy
20 patterns in this home, what the electricity or gas
21 consumption would be.

22 So this one would be for heating; this
23 one would be for cooling. And solving these beta
24 coefficients would obviously be a different
25 process for heating and cooling. And the process

1 of solving for those coefficients and finding the
2 best fit is all documented in this ASHRAE paper.

3 Next slide. So if you had a heat pump
4 where you had electricity being used for both
5 heating and cooling, the inverse model would look
6 more like this. This would be the balance point
7 temperature for heating. So below that
8 temperature your heating system comes on, and as
9 it gets colder you use more energy.

10 And this would be the balance point
11 temperature for cooling. And as it gets warmer
12 you use more electricity. Between the two it's
13 flat.

14 So these are really fairly very simple
15 models. This concept, as I've mentioned, has been
16 used for 15, 20 years in utility programs and
17 other things. And we're proposing that it be
18 included as a requirement for HERS tools.

19 Next slide, please. The temperature
20 data that's used in this analysis would be
21 available in a four-column format like this. The
22 first column is the month; the second column the
23 date; the third column the year; and the fourth
24 column is the average daily temperature for that
25 day.

1 This data is -- it's already available
2 at the University of Dayton website shown there
3 for about a half a dozen California cities. One
4 of the things we're going to need to do to make
5 this viable in California is to get this data
6 available for many more locations.

7 So, you can basically go to the website
8 and you download the whole data file. I mean, it
9 has all the data from 1995 or something like that
10 up through last week. And it's basically that
11 current.

12 And then, next slide, the next thing you
13 do is enter utility bill data. The first column
14 is the month; the second column the day that the
15 meter was read; the third column is the meter-
16 reading year; the fourth column is the electricity
17 consumption, peak demand, gas consumption. And
18 then the last two columns are post-retrofit
19 indicator. I'll get to those in a minute.

20 So, what you need then for this inverse
21 model to work is you need utility bill data for at
22 least a 12-month period. And you need temperature
23 data for that same 12-month period. And then from
24 that point it's just a very straightforward
25 process.

1 Next slide. Now, I mentioned that many
2 of the utilities have utility bill disaggregation
3 methods already incorporated on their websites.
4 And the HERS regulations in the technical manual
5 would permit the HERS providers to use that data,
6 to use those procedures in lieu of the inverse
7 model that we're proposing here. So the HERS
8 providers would have a choice about how they would
9 implement it.

10 Next slide. Now, one of the main uses
11 of this inverse modeling technique has been to
12 verify savings from utility programs. For
13 instance, if a utility has a program to give away
14 compact fluorescent lamps, you would look at the
15 whole population of homes, both before and after
16 this, and this technique basically normalizes your
17 data for weather. And you can see the savings
18 from implementing the program.

19 It can also be applied to a single
20 family home or a townhouse. And we're asking that
21 the HERS tools have the capability of doing this
22 post-retrofit utility bill analysis.

23 Can you go back two slides? One more.
24 Okay. So, we do these models here and we
25 calculate these coefficients for the pre-retrofit

1 house, right. So now then we're 12 months into
2 the future of the house; we can look at the
3 temperature data for each day of the year. And we
4 can use the results of this model to tell us what
5 the energy use would have been had we not made the
6 improvements, right.

7 And then we compare that to the actual
8 electricity consumption and gas consumption for
9 that same period of time, and it will show us the
10 benefits of the retrofit.

11 Can you move forward now about six
12 slides. More. There, okay. So what this shows,
13 this is a period of time prior to the retrofit.
14 The model, this inverse model was developed. And
15 then the dotted line up here shows the electricity
16 and -- I think this is -- is this electricity?

17 MR. PENNINGTON: Yeah, it's --

18 MR. ELEY: It's electricity.

19 MR. PENNINGTON: Right.

20 MR. ELEY: So this shows what the
21 electricity consumption would have been had the
22 improvements to the home not been made. And this
23 line at the bottom is actual electricity
24 consumption that was measured and metered in the
25 house. And the difference between the two are the

1 improvements.

2 So this is a powerful tool to show what
3 the real savings are to the consumer. And it
4 accounts for their occupancy patterns. It
5 accounts for their thermostat settings, the way
6 they use the house. It accounts for their plasma
7 tv's and all the other features that are actually
8 there in the home, because both of the lines on
9 this curve are utility bill lines.

10 The one at the top is a projection of
11 what it would have been without the retrofits.
12 And the one at the bottom shows what it would be
13 with the retrofits.

14 So this post-retrofit utility bill
15 analysis is one of the higher standards that we're
16 proposing for building performance contractors.

17 We would like, you know, the building
18 performance contractors are being treated in a
19 special way through these regulations. The
20 requirement for independence between the
21 contractor and the rater is being waived. And
22 we're, in a sense we're holding them to a higher
23 standard. And doing this post-retrofit utility
24 bill analysis is part of that higher standard.

25 Now, this service could, and we would

1 hope that most providers would still make this an
2 option to homeowners. It would be a very simple
3 thing to do because if you had the pre -- this is
4 perhaps something that could be implemented on the
5 HERS provider's website, where the customer could
6 come back a year or so after they have their home
7 rated, after they made the improvements and so
8 forth, and they could enter the utility bill data
9 for that period of time; and they could see a
10 graph much like this that would show them the
11 savings.

12 Next slide. Yes? Good timing. You're
13 going to have to come up here, though, Matt.

14 MR. GOLDEN: This is Matt Golden. We
15 try to do these 12-month ones, I mean it's part of
16 our business process to try to do 12-month post
17 anyways. But it's kind of annoying. We'd have to
18 fill out a form and fax it to PG&E. And it's this
19 kind of bureaucratic nightmare to get to the data
20 again. We have to pester our clients, and
21 sometimes they just don't really care.

22 And at PG&E they ask what can they do to
23 make my life easier. And every single time one of
24 the things I always say is make it easy for us to
25 access bill data. Solar companies, the same

1 problem, super-annoying.

2 Do you guys ever -- start to sort of
3 mandate to actually make it easy for us to get to
4 this information because it's --

5 MR. ELEY: Well, there's a
6 confidentiality issue at stake here that's driving
7 this whole thing from the utilities, because
8 it's --

9 MR. GOLDEN: What if we did something
10 like this -- I've been thinking about this a
11 little bit -- what if --

12 MR. ELEY: It's like no one wants to see
13 what you purchase on your MasterCard, right?

14 MR. GOLDEN: But what if it was
15 something along these lines where we have like
16 qualified contractors, raters, whatever the
17 baseline qualification is, that were on a list.
18 And they actually could go in and elect to give us
19 access to their data for a period of time. Choose
20 us up a list, say, and solar companies could be
21 included in that. Anybody who needs to access
22 bill data. Some like, you're a solar contractor,
23 you're a member of whatever, you can get on this
24 list. And then they can say, willing to give
25 Sustainable Spaces access for two years; click.

1 I mean it would just make life a lot
2 easier if we're going to have these requirements.
3 It would make everybody's life a lot easier,
4 actually.

5 MR. ELEY: I agree.

6 MR. PENNINGTON: So the proprietary
7 nature of this data, or the private nature of this
8 data goes back to the customer, that's the
9 homeowner, rather than the contractor who did the
10 work.

11 So, you know, somehow the utility's
12 going to have to be satisfied that the customer is
13 authorizing it.

14 MR. ELEY: Right.

15 MR. PENNINGTON: But maybe there --

16 MR. GOLDEN: Maybe they log in once at
17 the beginning, and then they just elect --

18 MR. PENNINGTON: Now maybe there can be
19 a lot easier process.

20 MR. GOLDEN: Because even things like
21 going on their website, if you go on PG&E's
22 website and you say usage history, you know I've
23 logged in before; sometimes it's two days before
24 it's there. So it's not even -- this is just
25 another little complexity.

1 We usually have to sit down with our
2 customers and walk them through it. And it's just
3 kind of a little bit painful.

4 MR. ELEY: I agree with you completely.
5 You know, we've talked about perhaps having --
6 when a customer signs up for a rating, perhaps
7 there's a form that they can sign that --

8 MR. GOLDEN: We have the form, actually.

9 MR. ELEY: -- that goes to the utility;
10 and it grants the utility permission to share the
11 utility bills with you for a period of time.

12 MR. GOLDEN: So actually we do that
13 form, but it's just painful. It has to be faxed
14 in. It doesn't always work and it's not that easy
15 still.

16 MR. ELEY: Oh, so you're already doing
17 it?

18 MR. GOLDEN: Yes. We have that form,
19 but it's just kind of a messy process. Any way to
20 streamline that would be helpful. And this is a
21 problem solar companies universally have. Nobody
22 keeps their bills. You end up doing things with
23 incomplete bills, missing months, stuff like this.
24 You can only pester people so much. So, it would
25 be helpful.

1 MR. PENNINGTON: So one followup I would
2 have is it seems like a ripe area for interaction
3 with the utilities to see if we could respond to
4 this as we move into a more systematic approach
5 that we're standardizing the way we do things to
6 go after existing homes. Has the time arrived
7 that we should try to figure out this problem?

8 MR. GOLDEN: I think so. I think, like
9 I said, you'd find all the building performance
10 and all of us would be happy, but all the solar
11 companies would be very happy about it, as well.

12 MR. MAEDA: Bruce Maeda, CEC Staff. One
13 thing, if you have their account numbers and their
14 information you should be able to go on the
15 website without worrying about the permission once
16 you have the --

17 MR. GOLDEN: No, it never happens.

18 MR. SPEAKER: You need their password,
19 too.

20 MS. SPEAKER: Right, you got --

21 (Parties speaking simultaneously.)

22 MR. BACHAND: Mike Bachand. Bill
23 Pennington's favorite bullet target. Regarding
24 that issue I didn't come up here to comment on
25 that, but regarding that issue that's a perfect

1 thing to coordinate through the providerships,
2 that kind of data. ID tags can be put on lots; ID
3 tags can be put on accounts. That information can
4 transfer, if desired, if not desired.

5 That would require some coordination
6 between, you know, utility databases and privately
7 owned databases which may be an issue for
8 utilities, too.

9 But I think that those two repositories
10 can connect, you know, should be able to connect
11 electronically with some foresight and some
12 thought, I think that could happen. I don't
13 anticipate a big problem, I mean, getting around
14 the legal issues is one thing. Getting around the
15 technical issues should be relatively easy.

16 But my comment. Could you flip back to
17 the last slide? The reason I came up here in the
18 first place was to talk about, this is a great
19 slide, but it's missing one component.

20 It's missing the predicted component of
21 what the improvements were supposed to do. So we
22 could have what it would have done if we didn't do
23 anything, what it did do, and what was it supposed
24 to do. Wouldn't that be a nice line to have on
25 that? I think it would be great.

1 MR. NESBITT: George Nesbitt. I drew
2 out our new California HERS index actually just
3 before Tom started talking.

4 So, seven years ago when I started doing
5 the ratings, like I said, you know, I instantly
6 found that the ratings and the actual billing data
7 -- because I did look at that from the start --
8 were so different, so I quit doing ratings. Of
9 course, there were software issues anyway. There
10 was no demand for real ratings anyway.

11 So about five and a half years ago when
12 CBPCA surfaced I was really hopeful because of the
13 TREAT software, because it promised to do a lot of
14 this. Of course, then there was the reality.

15 Spent a hell of a lot of time to learn
16 to use that program, and it did funny things. Any
17 time you changed the computer model it actually
18 changed the bill dis-ag. Now, wait a minute, the
19 energy use didn't change, the weather didn't
20 change, why would the bill dis-ag change because
21 we changed thermostat settings? It shouldn't, you
22 know, and it was like a dog having to chase its
23 tail, and it was hard to catch. So it was \$500
24 down the drain, and god knows how much time.

25 So I started making spreadsheets that

1 actually did the same thing, or much of the same
2 thing. So the utility bills are so critical.

3 One of the other issues with the
4 utility, getting the utility bills from the
5 utilities is they only give you a year's worth of
6 data. They don't give you the weather data as
7 part of it. But if your customer logs on to an
8 online account with PG&E they can get two years of
9 data which includes the weather data.

10 And, of course, as you said, the weather
11 data that TREAT used, I believe TREAT used the
12 same weather, says, yeah, great, there's six for
13 California. So, San Jose uses San Francisco
14 weather data. I mean that's just absurd.

15 I actually wrote a report that I got
16 pitifully paid for. It was probably worth 100
17 times what I got paid for. And perhaps maybe I
18 will submit it because I think there may only be
19 one other person in this room, other than myself,
20 that's seen it in four and a half years.

21 And so then the issue of
22 confidentiality, maybe it can get handled in some
23 way, that that data goes between the utility and
24 the provider. Maybe not back directly to the
25 rater, or somehow -- although there is definitely

1 value, I think especially to the home performance
2 contractors, to having that.

3 And yes, it is a little bit of a pain.
4 And it's actually hard to sometimes get customers
5 to sign it. Especially to grant you future right
6 to go after their data.

7 And then how this, in the technical
8 manual, you know, it talks about using the actual
9 billing data to tweak the model. So that's going
10 to be a big one for me because I don't think
11 it's -- we know what the answer is from the bills.
12 We typically know what heating and cooling is,
13 some of the major things.

14 So I think the approach of using a
15 simulation model to tune to bills is actually the
16 wrong approach. And I'd be happy to share
17 thoughts on that.

18 And I look forward to verifying savings.
19 And we were supposed to be doing that five years
20 ago. And I think doing that will really also help
21 us tune the models upfront. Because until we have
22 accurate models with accurate data, and then, you
23 know, look at the results and feed it back in,
24 we're still guessing. And so we'll slowly tune
25 the models better, which will be great.

1 MR. SCOTT: Robert Scott with CHEERS. I
2 just was thinking of this as I was sitting next to
3 a utilitarian.

4 (Laughter.)

5 MR. SCOTT: I wondered, what about -- I
6 mean wouldn't it be great if it showed up on their
7 utility bill?

8 MR. PENNINGTON: If what showed up on
9 their utility bill?

10 MR. SCOTT: Well, post -- I'm sorry, I
11 meant to talk about post-rating, or post-retrofit
12 performance. Then you could have something that's
13 universally there that's sort of part of it.

14 MR. PENNINGTON: It's a utilitarian
15 idea.

16 (Laughter.)

17 MR. SEGERSTROM: Charles Segerstrom from
18 PG&E. There is nothing more important in this
19 process than starting out with the right answer.
20 And that right answer is what the actual
21 consumption is before or after.

22 Now, we've been thinking about this
23 issue. There's nothing more important to us than
24 what our customers want. And right now
25 confidentiality and identity issues are absolutely

1 critical. So that's no small task.

2 But we hear it, we understand it, we're
3 trying to re-design our online audit tools so that
4 there can be an email that the customer could send
5 to the rater, auditor or consultant that contains
6 the data based on their online account.

7 As long as it's at the customer's
8 control, even in a three-way phone conversation,
9 you know, there are ways. But unlocking the keys
10 to customer data without the customer's direct
11 approval will, you know, involve many lawyers who
12 will probably not like that.

13 But we understand the importance of it.
14 We understand how golden the utility bill is to
15 everyone. Because if it doesn't accrue to the
16 bottomline of your utility bill, then we are
17 conducting academic exercises. Thanks.

18 MS. LAM: Thank you for that reply,
19 Charles. Right now we're going to go into the
20 final presentation on rating recommendations.

21 MR. ELEY: Next slide, please. So the
22 Warren Alquist Act says that the home energy
23 rating systems have to -- shall include reasonable
24 estimates, potential utility bill savings, and
25 reliable recommendations on cost effective

1 measures to improve energy efficiency.

2 So I'm citing this because we're
3 required by statute to develop these
4 recommendations. It's not something that's
5 optional.

6 Next slide. As I mentioned in the
7 morning presentation, we're recommending two
8 approaches, the standard approach and a custom
9 approach.

10 HERS systems have to be able to
11 accommodate both, however, only the standard
12 approach is required in any particular rating; the
13 custom approach is optional.

14 It's our intent that the standard
15 approach results in the same set of
16 recommendations no matter who the rater is, who
17 the provider is or any of the rest of that. It's
18 intended to be a very straightforward process.

19 Next slide. So what I'm going to do now
20 is go through and contrast the two methods.
21 First, in terms of how we would determine cost
22 effectiveness.

23 With the standard approach the list o f
24 recommendations would include everything that's
25 cost effective, no matter what the cost to the

1 consumer. So, if it has a benefit/cost ratio of
2 greater than 1, it's in. If it has a benefit/cost
3 ratio of less than 1, it's out.

4 The custom approach could take alternate
5 approaches. It could solve the question of well,
6 what's the best package of measures that I can get
7 for \$10,000. Or it could solve the question,
8 what's the least costly package of measures that
9 will get me to a HERS index of 80.

10 Or it could evaluate a list of measures
11 that the customer wants to do. Maybe they only
12 want to replace their windows and air conditioners
13 and insulate the attic. So you can put those in,
14 and do the evaluation on those.

15 Next slide. The approach that we're
16 recommending being used here is what's sometimes
17 called the rolling basecase method. You would,
18 with this method you would start with the home in
19 its present condition. And from that base all
20 possible measures would be looked at. And the one
21 with the highest benefit/cost ratio would be added
22 as the first measure.

23 So that would become the new basecase.
24 And from that new basecase you would then look at
25 all applicable measures relative to that basecase.

1 And the one with the highest benefit/cost ratio
2 would be added.

3 And that process would be repeated until
4 all remaining measures had a benefit/cost ratio of
5 less than 1. At that point you'd know you reached
6 the minimum point on the lifecycle cost curve and
7 you can stop.

8 Next slide. So, in terms of determining
9 whether a measure is cost effective or not, with
10 the standard approach the TDV savings would be
11 calculated. And those savings would be multiplied
12 times the net present value multiplier per unit of
13 TDV savings. And that would give us the net
14 present value of the future energy savings of that
15 measure.

16 Those would be compared against the
17 incremental cost of putting that measure in the
18 home. And that would be the benefit/cost ratio
19 that would be used.

20 In the case of the custom approach,
21 alternate approaches could be taken. For
22 instance, the customer could choose to finance the
23 improvements through an energy efficient mortgage.
24 In which case the rater would need to know the
25 interest rate on the mortgage, the homeowner's tax

1 bracket and many other factors.

2 Likewise, building performance
3 contractors are beginning to try and quantify
4 nonenergy benefits related to safety, security,
5 indoor air quality, acoustics and other factors
6 like that. Those could be factored in.

7 Next slide. In terms of utility rates
8 with the standard approach it's the CEC's
9 forecasts of energy costs are already incorporated
10 into the net present value multipliers for TDV
11 energy. So they're already into the fold.

12 With the custom approach the utility
13 rate that the homeowner sees would be used. And
14 that's why the HERS tool would have to be able to
15 model utility rates.

16 Next slide. With the standard approach,
17 all of the HERS modeling assumptions would be
18 used. These are all the same assumptions we
19 reviewed two presentations back.

20 But there's one exception. If the home
21 doesn't have air conditioning we would not look at
22 cooling savings. Even though the cooling savings
23 are sort of in the HERS index, but not -- it
24 wouldn't be an important factor.

25 With the custom approach, however, the

1 rater may modify certain things to better reflect
2 the occupancy patterns of the occupants. Winter
3 vacations, summer vacations, elderly couple with
4 higher thermostat settings. Factors such as that
5 could be put into the model to cause the model to
6 better approximate the actual energy consumption
7 of the home.

8 Next slide. I think we covered that.
9 Next slide. This is a graph of the 16 climate
10 zones and the height of each bar are the number of
11 homes in that climate zone. So you can see
12 climate zone 3, San Francisco Bay Area, has 1.3
13 million homes. And most of them don't have air
14 conditioning you can see.

15 So the concentration of homes in the
16 existing stock is very different from the new
17 homes that are being built. New homes are
18 typically in hotter climates where cooling is a
19 much bigger factor.

20 So, when we were looking at those pie
21 charts earlier of average electricity and gas
22 consumption, that's why the cooling was so small.
23 So we're recommending that the air conditioning
24 not be modeled.

25 Next slide. In terms of the measures

1 and costs that affect the rating, with the
2 standard approach the raters and the HERS
3 providers would all use the same database of
4 measures and costs. With multipliers for regional
5 cost variations.

6 With the custom approach the HERS
7 provider could enter bids that the homeowner has
8 received. They could put in other data that they
9 feel are more relevant because of the special
10 circumstances of a home that they visited and
11 rated.

12 Next slide. There are certain
13 categories of measures that would always have to
14 be considered in the standard approach. And these
15 would include building envelope, insulation
16 levels, window replacements, lighting measures,
17 HVAC, water heating, appliance and PV systems.
18 So these categories would always have to be in the
19 mix.

20 Next slide. There's a database for
21 energy efficient resources, sometimes referred to
22 as DEER. That's been around for 10, 15 years.
23 It's received financial support from both the
24 Energy Commission and the CPUC. The California
25 Public Utilities Commission has designated the

1 DEER database as the official source for measure
2 costs and savings.

3 We're proposing that the DEER database
4 be used as the starting point for a HERS database.
5 But we're not going to look at measure savings,
6 just the costs. The savings are the part of the
7 DEER database that's been more controversial, and
8 we're not proposing to use those. Just the costs
9 of the measures.

10 Next slide. We're also proposing that
11 HERS providers work together to maintain and
12 update this cost data on at least an annual basis.
13 And the goal is that data that's used for the
14 custom approach will help inform providers of
15 significant errors or deviations from the standard
16 data.

17 So the idea is that at least once a year
18 the HERS providers can come together and they say,
19 well, you know, the cost of -- the DEER cost for
20 attic insulation is too low. We've got it at 58
21 cents a square foot, and all my bids are coming in
22 at 78. I think we should increase that number.
23 And the other HERS provider says, well, no, 78's
24 not quite right, it should be 75.

25 Anyway, the idea is to agree on periodic

1 changes to update this database. Right now it's
2 called the DEER database. As it evolves it will
3 just be the HERS database. And it will -- and we
4 want to put in place process where the database
5 is formed from construction or improvement bids
6 that homeowners receive from data that providers
7 on the ground feed back up to the providers.

8 Next slide. For measures that do not
9 affect the HERS index, this would be pools and
10 spas and so forth, with the standard approach what
11 we're recommending is sort of a simple list of
12 recommendations that don't really require any
13 analysis. It's more the situation well, if such
14 and such is present, then here's the
15 recommendation.

16 So, for instance, if there's a swimming
17 pool without a cover then there's a recommendation
18 to put in a cover, you know. If there's a
19 filtration -- swimming pool filtration system
20 without a timer, then there's a recommendation to
21 put in a timer. So it would be just real simple
22 sorts of thing; where we really want to leave it
23 open with the custom approach so that HERS
24 providers can eventually do a more thorough
25 evaluation if they want to, you know.

1 Next slide. In terms of energy bill
2 history we expect the raters to collect utility
3 bill data when it's available and enter it into
4 the tool so that the utility bill analysis, that
5 we showed this morning as part of the report, can
6 always be generated.

7 And really the same requirements with
8 the custom approach except with the custom
9 approach we would also expect the inverse modeling
10 technique to be used to verify the savings
11 associated with retrofits when that's appropriate.

12 Next slide. And then finally there
13 would be, the recommendations report would have a
14 list of qualifiers, the cost effectiveness
15 methodology -- this is mainly disclosure
16 information to the homeowner.

17 The recommendations we came up with were
18 based on these assumptions. It lists them all
19 out. What method was used; the method of
20 determining cost effective; what utility rate was
21 in effect; the modeling assumptions; the measures
22 and costs. All of those things would be
23 disclosed.

24 So, that's the recommendation that's --
25 it's embodied in the HERS regulations, and also in

1 the technical manual.

2 And I believe that's it. So we can take
3 comments on this last part of the presentation.

4 MR. SCOTT: Robert Scott from CHEERS.
5 Just a kind of a question about the custom
6 approach and I guess what would concern me, as a
7 provider, is knowing that modifications to
8 assumptions in that customized approach could have
9 a fairly significant impact on what shows up in
10 the list, et cetera. So there has to be some one,
11 I would imagine be some constraints on what kinds
12 of assumptions could be changed, and how that
13 might occur.

14 Because you talk about these other
15 things such as putting in the cost database and
16 maintaining all of these things, and if we
17 allow -- I mean it's great to have a tool
18 available so you can provide custom approaches and
19 all of this, but if we give somebody the gun and
20 off they go, and we never see them again, we've
21 pretty much lost control over the use of it.

22 So I guess I just think we need to
23 really consider what assumptions would be
24 modifiable; you're talking about occupancy
25 patterns and thermostat schedules and --

1 MR. ELEY: Right. We want the HERS
2 provider to be in the loop on all of this
3 information. And then when custom reports are
4 generated by a rater, that the alternate
5 assumptions that are used, they would be reported
6 to the provider; alternate costs would be reported
7 to the provider.

8 So the provider ends up with some
9 information that could be used to improve the
10 system that they're putting in place.

11 MR. SCOTT: Right. No, and I think
12 that's great, and I appreciate, you know, us being
13 able to do that. But I guess I'm thinking of
14 flexibility within these tools --

15 MR. ELEY: You're also looking --

16 MR. SCOTT: -- but then we lose control
17 over it, and now it's out there being used for
18 other purposes. I don't know, I just --

19 MR. ELEY: Right.

20 MR. PENNINGTON: So the other thing we
21 might say is that these caveats are supposed to be
22 presented, and that information is supposed to be
23 available for why it was changed.

24 And we anticipate that that would be
25 something that would be reviewed during a QA

1 process to see if, you know, that's hanging
2 together, or if there seems to be some
3 manipulation of the situation. And it would be
4 feedback on what's going on with that rater.

5 The other thing I would say is if you
6 have ideas on how these things should be
7 constrained, we'd be really open to your ideas. I
8 think it's not trivial to figure out how we would
9 constrain, you know, legitimate variation. And so
10 how do you -- you know, where do you cross the
11 line between legitimate and not legitimate, and
12 how do you know, I think is part of setting up
13 constraints.

14 So, if you have any insight into that,
15 that would be helpful.

16 MR. SCOTT: Okay, yes. I want to make
17 sure that's clear, I'm not saying -- I'm saying
18 that for the majority of raters that we have out
19 there, that's not my concern. My concern is
20 external forces using these tools in some other
21 fashion that we never see. Which happens anyway.

22 MR. PENNINGTON: These are aliens? I'm
23 not sure --

24 MR. SCOTT: These are aliens.

25 (Laughter.)

1 MR. SCOTT: Yeah, aliens using the
2 tools.

3 MR. BACHAND: This is Mike Bachand. I
4 voice a similar concern as Robert's. I have the
5 same feelings about the danger of lack of real
6 data, and the continuity. Constraints are
7 difficult, but I think we should work on getting
8 some kind of an idea.

9 It's very difficult for providers, for
10 instance, to monitor anecdotal information. Now,
11 you might not think it's anecdotal because it's
12 been typed in here with what the bid was and
13 everything.

14 We don't, you know, our computers don't
15 review necessarily each one of those documents
16 that comes through. Those documents are -- you
17 know, all that data goes into little spots in a
18 database table somewhere out in the middle of
19 cyberspace.

20 And so what we're talking about, in
21 order to actually be able to rely on that
22 information being within reason and understandable
23 and usable, would be -- it could be massive
24 amounts of going through papers, you know, one at
25 a time. That's not going to happen probably. So

1 it's not cost effective to do that.

2 So, I think we should try to work on
3 something that leaves us with a custom approach,
4 but leaves it within bounds that it can be managed
5 and relied upon to be the tool that you want it to
6 be to project forward. I think if we use a bad
7 tool to project forward, then we're going to
8 possibly end up with bad projections.

9 So, I'm with Robert; and I'd like to
10 work on that.

11 MR. PENNINGTON: Thank you.

12 MR. CONLON: Tom Conlon; try to be brief
13 here. The cost data, if I understood you
14 correctly, on the standard side the cost data
15 would be fixed by the Commission? Or is that up
16 to the discretion of the provider?

17 MR. ELEY: We want it to be the same for
18 all the providers.

19 MR. CONLON: I would agree that it
20 pretty much has to be.

21 MR. ELEY: And as a starting point we
22 want to start off with the DEER data because we
23 think that's the best starting point that we have
24 right now.

25 It's really we envision a process that

1 relies mostly on the providers to update the
2 database on at least an annual basis. It would be
3 the Energy Commission would play a role in that
4 process as maybe a referee or --

5 (Laughter.)

6 MR. ELEY: -- a facilitator.

7 MR. CONLON: And regional modifiers
8 could be also developed and discussed in that same
9 framework.

10 MR. ELEY: Yes, the regional modifiers
11 are actually already published in the HERS topic
12 report. There's an appendix in the HERS topic
13 report that the DEER cost data with some
14 recommended regional modifiers.

15 MR. CONLON: Okay, so I think what that
16 sounds like then is it's committing to an annual
17 cycle of review for the cost side of the equation
18 here at the Commission; and then we could
19 potentially be also opening other pieces of the
20 program up for review on an annual cycle.

21 Or would it be intended to be more or
22 less three-year cycle with the new construction
23 standards for going back to look at issues like
24 the reference home, et cetera?

25 MR. PENNINGTON: The other thing that's

1 covered, partially to respond to your question,
2 the other thing that's covered in the topic report
3 is the potential for measures that are not
4 simulatable, and are covered, as Charles was
5 explaining, in the standard approach by a
6 prescription, you know. If you have a pool you
7 need to have a pool cover.

8 So there's an openness to the providers
9 having some flexibility to develop calculation
10 techniques for sort of things on the margin. And
11 the expectation that those would be periodically
12 reviewed and standardized over time, and brought
13 into the standardized calculations over time.

14 And the frequency of that, you know, I
15 don't think we're going to do it more frequently
16 than annual.

17 MR. CONLON: Yeah. And then I missed
18 the utility analysis discussion, so I'll just
19 simply say that -- the utility bill analysis
20 discussion -- but from the -- the definition of
21 how a bill is available and when it is available.
22 We should try and tighten that up perhaps a little
23 bit so that the intent is clear to the parties how
24 hard they have to work to try and get the bills.

25 Thank you.

1 MR. BACHAND: This is Mike Bachand
2 again. I forgot something the last time. We're
3 going to plug in utility rates on these
4 calculations. But I know from my own SMUD bill,
5 you know, I pop up into tier two sometimes; and
6 sometimes I'm in tier one, and I don't know when
7 I'm going to go to tier two or anything.

8 How do we know what rates to plug in
9 when we don't know how often a person bounces
10 between tiers and things? Is there some kind of
11 margin of error that, or slack, or something in
12 the process that accounts for that?

13 MR. ELEY: Well, what we'd be collecting
14 primarily would be consumption data, kilowatt
15 hours for the building period and therms for the
16 building period.

17 The utility rate model would have to
18 apply the utility rate structure. And that would
19 be based on simulated results.

20 So you may have some variation, but it
21 wouldn't be occupant-driven, it would be climate-
22 driven.

23 (Pause.)

24 (Parties speaking simultaneously.)

25 MS. LaPIERRE: Alice LaPierre with the

1 City of Berkeley. I kind of have a love/hate
2 relationship with a E3 calculator. Some of the
3 measures I find the modeling for to be not really
4 realistic. CFLs having a ten-year lifespan is not
5 realistic.

6 On the other end of that is the
7 insulation values are a lifespan of 20 years for
8 attic or wall insulation is not realistic. I
9 mean, homes have insulation in them for much
10 longer than that. And I'm sure there's a complex
11 methodology behind this that I've totally missed
12 in my time here.

13 But if you could explain if there's
14 anything in the works to maybe look at that or
15 address that. It would certainly make putting
16 those very effective measures in place and
17 installing them much more cost effective. And
18 that's really what we would love to see. Thank
19 you.

20 MR. PENNINGTON: So, we're only
21 proposing to use the cost data out of the DEER
22 database rather than the energy calculations that
23 you're referring to. So I don't know if that
24 gives you any warm feeling or not.

25 (Laughter.)

1 MS. ASAN: I don't know if that does it.
2 Tenaya Asan from BuildItGreen. A couple things.
3 On the modeling for vacation time, I have a little
4 bit of concern for that if that was the
5 information that was put onto the front label.
6 I'm assuming that this information will be used at
7 sale of the property, et cetera. So vacation time
8 is really an occupancy use, not a home use.
9 So, --

10 MR. ELEY: This would be limited just to
11 the custom approach.

12 MS. ASAN: Okay.

13 MR. ELEY: Everything on the rating
14 certificate would use the standard occupancy.

15 MS. ASAN: Good, good. And I wanted to
16 jump on what Alice was saying. There's a couple
17 things on the cost effectiveness tool that I think
18 ought to be addressed.

19 One is I want to make sure that that is
20 beta tested so that, for instance, the insulation,
21 right now the cost effectiveness is based on a 20-
22 year lifecycle, which would not make insulation a
23 particularly cost/benefit practice. And it really
24 is.

25 So at least there ought to be a beta

1 test or something on what shows up and we can
2 evaluate those before it gets thrown out.

3 Just a couple other items. I'm thinking
4 that at the end of this topic section where you've
5 got the list of costs, those are what is in DEER.
6 I'm not particularly familiar with all of what's
7 in DEER, but I've noticed a couple things that are
8 missing.

9 One is duct change-out. You do have
10 duct sealing here. Looks like it's only to 12
11 percent. But there is some duct sealing there.
12 But many times it's more cost effective to
13 actually change out the ducts.

14 The second one is that there's no cost
15 for sealing the envelope, air changes or SLI. And
16 also the last one was radiant barrier, which is
17 another cost/benefit practice that can be put in,
18 and I didn't see that they were there.

19 MR. NESBITT: George Nesbitt. They say
20 making sausage is ugly, but I'd rather make it
21 than have it made of me.

22 There have been a lot of wonderful
23 comments and ideas today out of everyone. And it
24 would be really great if we could come back in a
25 series of workshops on smaller, little bites,

1 rather than the whole thing.

2 And we, as Cal HERS raters, look forward
3 to working with all the stakeholders. And I think
4 if we really can sit down in a less formal
5 atmosphere and work together, we can really make a
6 great tool.

7 On the cost savings, I've been using
8 like average utility costs and TREAT used average
9 utility costs. The problem is when I break down
10 energy use I'm understating what some of the real
11 costs are, and overstating what others are. And
12 then when you predict savings you're also doing
13 the same.

14 I notice that like especially for the
15 standard report or recommendations, but I'm also
16 wondering on custom, how cost savings are going to
17 be projected. Because when you have someone who's
18 in multiple tiers, so I know for the standard
19 approach, if I understand it right, you're going
20 to take that first most cost effective
21 recommendation, you're going to take that right
22 off the top.

23 Let's say that bumps you out of tier 5
24 into tier 4, just for example. Your second
25 recommendation is now on a lower cost. So

1 therefore it becomes increasingly less cost
2 effective because you're now calculating it on
3 lower and lower rates.

4 Yet when you do a whole bunch of things
5 together, I mean is it really honest to then say,
6 well, this thing, you know, saved you more money
7 per energy use than that thing.

8 And I've been struggling, although I'm
9 limited in my abilities, to develop some billing
10 dis-ag spreadsheets, and also to make my savings
11 and cost projections based on tiers. And, of
12 course, they're assuming rate schedules, and I
13 don't know how they differ between utilities.
14 And, you know, and then we get into the whole TDV
15 thing, which I'd like to, also.

16 So, that's it.

17 MR. ELEY: Well, the tier thing would be
18 an issue if it were a custom approach, but would
19 not be an issue with the standard approach.

20 MR. SCOTT: Robert Scott. A question
21 had to do mostly with the customized approach, and
22 is there -- I'm assuming that in the standard
23 approach escalation rates for utilities --
24 escalation rate of utility costs would be embedded
25 in that.

1 But what about is there any thought
2 about that for custom?

3 MR. ELEY: Well, it depends on what
4 measure of economic performance you're looking at.
5 If you're looking for your savings to equal your
6 mortgage premium increase, then escalation would
7 not be relevant.

8 MR. SCOTT: Right.

9 MR. ELEY: So I think there might be
10 some test of cost effectiveness that would require
11 some consideration of energy escalation. And this
12 would probably be something that -- right now it's
13 wide open, though I guess you could --

14 MR. SCOTT: Right. Well, likely in some
15 sort of other kinds of financing that you might be
16 doing, so you're trying to show the consumer
17 something that may not be mortgage-based, and so -
18 - okay.

19 MS. ASAN: Tenaya Asan again from
20 BuildItGreen. At BuildItGreen we work with a lot
21 of local jurisdictions in helping them to develop
22 their local green building ordinances. More and
23 more of those are becoming mandatory green
24 building ordinances.

25 We're also working some with the Climate

1 Action Team and they're developing their plan to
2 meet AB-32 requirements.

3 And so we get screams from local
4 jurisdictions, you know, what can we use for our
5 using homes. And some of those are mandatory time
6 them to high-end remodels they want to put in a
7 mandatory requirement.

8 And I guess what I'm asking for is if
9 there is going to be a way that we can provide
10 them with some of this information as to what's
11 coming down the pike. I don't know if it would be
12 possible to have the PowerPoint either, you know,
13 on a pdf, because it really summarizes things very
14 clearly. If you try to go through here it's much
15 more difficult.

16 But something that really summarizes
17 what you folks are doing that we can provide to
18 cities as they're trying to figure out what
19 they're, how they're moving forward.

20 MS. LAM: I just want to say that the
21 PowerPoint presentation will be posted online on
22 Monday.

23 MS. ASAN: Great. And then if we do
24 have someone that, you know, a city or a local
25 group that would like to have someone come and

1 speak to what you're doing here, who would I
2 contact about that?

3 MR. PENNINGTON: You can talk to Helen
4 and we'll work with you on that.

5 MS. ASAN: Thanks.

6 MR. GOLDEN: Matt Golden. It's almost
7 the end of the day so I want to keep this short.

8 But first I just want to say that we've
9 been so busy making sausage here that we forget,
10 this is incredibly important stuff.

11 So I just wanted to -- I think, spoke to
12 people at lunch and this is totally revolutionary.

13 If we can get this in place it's going
14 to close the loop on green building and efficiency
15 and actually tie it to things like appraisal
16 values and things that we can back with
17 securities.

18 And so with all the granularity, I mean
19 I can speak for myself, I guess, that we're in
20 total support and want to make sure we're here
21 when the real estate agents come here in force and
22 everything else, and really see this through.
23 Because it's going to have such large impacts on
24 energy efficiency in general. It's really
25 powerful.

1 So, that's -- I just wanted to make sure
2 that got said, because I feel we've just been
3 really focused on the nitty-gritty and no one's
4 really talked about how important this is.

5 And then now my little basic question is
6 what are we thinking when we get energy bill data,
7 which I'm in total support of it. What's the
8 analysis there, and like what happens if, I don't
9 know -- we have clients that have gravity furnaces
10 and we put in forced-air furnaces, and make them
11 efficient and they keep their house warm and their
12 bills don't go down very much.

13 But nothing's more efficient than a
14 furnace that's off. So, I don't know, I'm just
15 curious. Like do we have -- what are we going to
16 do with that data?

17 MR. ELEY: You mean apart from the
18 analysis we're requiring?

19 MR. GOLDEN: Well, you know, go back and
20 we get the followup bill data, what's the
21 analysis, what are we looking for, what are our
22 goals?

23 MR. ELEY: Well, the post-retrofit
24 analysis would enable us to look at the kind of
25 graph that we saw up there and --

1 MR. GOLDEN: And just compare back to
2 our projections?

3 MR. ELEY: -- the customer could --
4 yeah, can see what the benefits, what they would
5 have been paying and what they are paying. They
6 can see that difference. That's the primary
7 purpose.

8 MR. GOLDEN: Okay. Thanks.

9 MR. PENNINGTON: Thanks very much.

10 Yeah, so let's go back to the first
11 question of the day. What's the schedule and that
12 sort of thing.

13 We're planning to adopt regulations by
14 the end of this calendar year. And if you kind of
15 back up with that as a goal, we would be getting
16 into a formal rulemaking that would happen in the
17 fall and beginning of the winter.

18 And so that would need to start probably
19 in September sometime like that is when we would
20 need to start a formal rulemaking in order to get
21 finished.

22 We're anticipating another workshop
23 probably in August. That very well could be a
24 workshop presided over by the Energy Efficiency
25 Committee, the two Commissioners that are on that

1 Committee.

2 In the meantime we're very interested in
3 the comments that you have, and we'll be trying to
4 work on addressing your comments.

5 And there was, in the notice, a
6 specification of getting comments in within a
7 week. It would be very useful to us if you would
8 provide us with the comments that you're able to
9 provide in a week. And we'll be able to keep
10 moving here.

11 People are going to be able to comment
12 on this decision up until it's made. And so, you
13 know, the decision will get made in December.

14 And we're going to have some more
15 meetings here. So there's more opportunities to
16 comment as we go. If you can't get all your
17 comments to us in one week, well, two weeks would
18 be good. But we really would like to hear from
19 you as soon as possible.

20 Any questions about that?

21 MS. SPEAKER: Good work.

22 MR. PENNINGTON: Okay, thank you.

23 (Applause.)

24 MS. LAM: I want to thank the
25 presenters, Charles and Dan. And thank you,

1 everybody, for your attendance.

2 And we look forward to receiving any
3 additional comments you may have regarding this
4 workshop.

5 (Whereupon, at 4:05 p.m., the workshop
6 was adjourned.)

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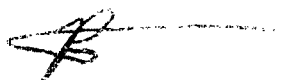
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I, PETER PETTY, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Commission Staff Workshop; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said workshop, nor in any way interested in outcome of said workshop.

IN WITNESS WHEREOF, I have hereunto set my hand this 17th day of May, 2008.



PETER PETTY