RENEWABLES COMMITTEE WORKSHOP
BEFORE THE
CALIFORNIA ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION

In the Matter of:
Senate Bill Eligibility Criteria and Conditions for Incentives

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10:00 A.M.

Reported by:
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Contract Number: 150-07-001
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Jan McFarland
Tim Tutt

STAFF PRESENT
Martha Brook
Diana Chong
Chris Gekas
Smita Gupta
Sandy Miller
Claudia Orlando
Bill Pennington

ALSO PRESENT
Michael E. Bachand, CalCERTS, Inc.
Raghu Belur, Enphase Energy
Robert Benedict, Soulier, Inc.
Julie Blunden, Sun Power
Peter Brehm, Infinia Corporation
Leslie Brown, City of Santa Clara
Adam Browning, the Vote Solar Initiative
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David Bruder, Southern California Edison
Steven P. Chadima, Energy Innovations
Erin Clark, Regrid Power
Jeanne Clinton, California Public Utilities Commission
Benjamin Collinwood, Sanyo Energy USA Corporation
Tom Conlin (via telephone)
Mark Gaines, Sempra Energy
Bobbi Glassel, Energy Efficient Mortgage
Matt Golden, Sustainable Spaces
Bob Knight, California Building Performance Contractors Association
Michael Keyes (via telephone)
Dick Lowry IV, Sharp Electronics
Andrew McAllister, California Center for Sustainable Energy
Joelene Monestier, SPG Solar
Dan Perkins, Energy Smart Homes
David E. Rubin, Pacific Gas and Electric Company
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PROCEEDINGS

10:03 a.m.

PRESIDING MEMBER GEESMAN: Let's go ahead and get started.

MS. ORLANDO: Good morning everyone, welcome. Just a few housekeeping rules before we begin. If you are not familiar with the building the closest restrooms are right out the door and right over this way. There is a snack bar on the second floor under the white awning.

If there is an emergency and the sound of an alarm we will all assemble in the park diagonally to this building, Roosevelt Park. So just follow the staff and exit and we'll reconvene over at the park.

If you have cell phones please put them on silence and then if you need to take calls please exit the room all the way out through the doors and keep the conversation outside. Let's see. And I think that's it. Okay, thank you.

PRESIDING MEMBER GEESMAN: Good morning, this is a meeting of the -- a workshop by the California Energy Commission Renewables Committee on our staff report regarding SB 1 eligibility criteria and conditions for incentives for solar
energy systems carrying out some of the statutory mandates of SB 1.

I am John Geesman, the Presiding Member of the Commission's Renewables Committee. To my left Commissioner Jackalyne Pfannenstiel, the Chair of the Commission, the Associate Member of the Renewables Committee. To her left, Tim Tutt, her staff advisor. To my right, Suzanne Korosec and Jan McFarland, my staff advisors.

We have a bit of a constrained schedule today. Because of other commitments I am going to leave at 11:45; Commissioner Pfannenstiel is going to leave at one. I would suggest that the Committee portion of the workshop be completed no later than one o'clock. If there is a need or a desire to continue after one o'clock, as I suspect there may very well be, that portion will be a staff workshop.

As always written comments are extremely helpful to the Committee. Encourage you to submit those. And why don't we proceed immediately then to our agenda. Bill, I think you're first up.

MR. PENNINGTON: Okay, thank you. Thank you very much. My name is Bill Pennington, I'm the manager of the Buildings and Appliances Office
at the Energy Commission. What I plan to do here
is briefly go over the directives that SB 1 gave
to the Energy Commission related to this subject
and some of the policy considerations that we've
recommended be considered in coming up with
conclusions.

The assignments that SB 1 gave to the
Energy Commission are on this slide. We are to
consult with the PUC, publicly-owned utilities and
interested members of the public to develop three
things. And these are to apply to all PV programs
that are administered by the Energy Commission, by
the PUC and by the POUs.

The three things are to establish
eligibility criteria. The statute actually lists
eight or nine types of criteria, most of which are
specifically stated pretty explicitly in the
statute. But the one that is stated with more --
less specificity and more authority for the Energy
Commission to use its discretion is the first one
in the list, which is to develop eligibility
criteria related to the design, installation,
electrical output standards or incentives. And so
that's a real broad, meaty area that is multi-
faceted that is sort of the number one eligibility
criteria.

Secondly the Energy Commission is to establish conditions for ratepayer incentives and there are several elements related to that.

And thirdly the Energy Commission is to set rating standards for equipment, components and systems.

The statute does describe in one of the subsections in this general area kind of expectations, legislative expectations related to what we're to accomplish. So this slide describes those.

We're to accomplish high quality solar energy systems with maximum system performance to promote the highest energy production per ratepayer dollar.

Optimal system performance during periods of peak demand.

And appropriate energy efficiency improvements in new and existing homes or commercial structures where the solar system is installed.

So those are kind of goal statements from my vantage point related to this overall activity that the Energy Commission is pursuing.
There's a number of other energy policy directives or considerations that the report recommends that the Energy Commission consider in developing these eligibility criteria conditions for incentives and rating standards.

First off the Integrated Energy Policy Report in 2004 and 2005, anticipating the Governor's Million Solar Roofs Initiative being pursued on a statewide basis, established policy guidance for what such a statewide system should look like. And so these are key items that related particularly to setting eligibility criteria that come out of those IEPRs.

So key are leveraging energy efficiency improvements should be a primary consideration in deploying PVs. And there are some kind of rationale language from the IEPRs there.

Rational targeting of PV deployment to achieve the greatest cost benefit targeting to climate zones with high peak demand.

Transitioning away from capacity-based incentives to performance-based incentives.

In general the IEPRs spend quite a bit of time talking about integrating energy efficiency and time-of-use considerations in a
statewide program.

In addition to that there's other energy policy goals that we highlight in the staff report that are related. First off, the Energy Action Plan, which was covered in these IEPRs as well and was supported by the Governor in his review of those IEPR. It sets up a loading order that would have energy efficiency be the first resource to be considered, renewables second and other clean generation technologies third.

So there is a strong interest in having energy efficiency pursued at the top of the loading order followed by renewables. So in actuality we have an opportunity through this program to pursue both of the two, top items in the loading order in one program.

Secondly of key importance here is the Climate Action Initiative with the Governor's policy-making related to that and also supported by AB 32 that establishes California in a world leadership position related to climate action and sets very aggressive goals related to climate change that we need to be pursuing and getting to 1990 levels by 2020.

The policy documents that are being
developed related to the climate action initiative
frequently mention energy efficiency and
renewables as strategies that are going to be key.
In general it is staff's perception that you are
not going to get to these levels without having
major accomplishments from the building sector.
And the building sector needs to be using both all
cost-effective energy efficiency and all
renewables, all PV systems that can achieve in
order to accomplish these goals. And failing that
you're not going to meet these goals.

There's a couple of pieces of
legislation that are important here too that
direct the IOUs through the PUC, and the POUs, for
first meeting unmet resource needs by viewing
energy efficiency, pursuing cost-effective energy
efficiency. And that's additional guidance that's
been in statute that says we should be paying
attention to energy efficiency whenever we're
considering a resource addition.

And finally another point that's
important that staff recommends here for
consideration is the Green Building Initiative,
which is the Governor's initiative to achieve 20
percent savings by 2015 for state buildings and
encouraged that same goal to be achieved for all commercial buildings. So we view that as an important backdrop related to developing these criteria also.

The Energy Commission has pursued goals very similar to these through the New Solar Homes Partnership. This is the goal to create a self-sustaining market for solar homes where builders incorporate high levels of energy efficiency and high performing solar systems. That is the goal for the NSHP and the Commission has worked hard to develop tools that will accomplish that goal.

And the tools are listed here on the slide. Each of these we think are very useful and important for accomplishing the goal. And we think since this goal is very similar to the SB 1 goal, and since, you know, we have personal experience in trying to develop these tools, that it is logical to consider extension of these tools for SB 1 purposes. So that’s kind of our point of view.

Related to that there is also an energy efficiency obligation and expectation that is built into the New Solar Homes Partnership. That we also kind of view as our baseline of thinking
that we think it's important to be pursuing energy
efficiency in combination with photovoltaics and
that the two approaches are symbiotic and support
each other. It's important to work on them
together. We think that it's important to have a
minimum level of energy efficiency as a condition
for participation in a PV incentive program. And
we also think that the program should encourage
going to broader levels than that.

Ultimately we think that we should be to
zero energy buildings and that that should be the
state's ultimate goal. We think that that's going
to be necessary to meet our climate change goals.
So we've tried to set up a system like that for
the New Solar Homes Partnership.

There is a Tier I level that is a
minimum level. I should say, one way that you
might approach figuring out how much energy
efficiency is appropriate when you're doing, in
conjunction with a PV project, is you might think
about doing all energy efficiency that would be
more cost-effective than a PV system. And that is
rational way to think about what is societally
best and what is in the best interest of the
building owner and so forth.
That could end up with very aggressive, extraordinarily aggressive energy efficiency levels and you might get into practicality issues related to achieving that level of energy efficiency.

So the Commission actually thought about that some on the New Solar Homes Partnership and decided that that wasn't the criteria we wanted to use, but rather we wanted to try to co-brand our energy efficiency efforts with other energy efficiency programs that were out there and look for ways to pursue levels of energy efficiency that were perceived to be doable and practical and achievable and that were being pursued by other programs.

Also where there might be additional incentive funds available or, you know, other kinds of ways to incent participation such as recognition or differentiation in the marketplace or whatever. There might be other motivators that would be motivating people to achieve those levels. Rather than coming up with criteria that would be separate from those, and independent of those we thought it was appropriate to try to align our criteria with those kinds of programs.
So that was the idea of co-branding the NSHP with prominent energy efficiency programs.

We have two tiers in the NSHP, a minimum level that is a minimum level for obtaining an incentive for the PV system that is set at 15 percent better than the Title 24 standards, which is the level at which the IOU new construction program have been shooting for several years. So the Tier I is intended to co-brand with that, with that level of program that's out there.

Tier II we did quite a bit of discussion with the building industry to identify a second level that would be a preferred level. We kind of view the Tier I level as a baby step and something that we actually should do better than, given that society is placing this level of investment into this technology, and given that we need to have, we need to be moving towards zero energy use buildings. So our preferred level is really the Tier II level.

And we engaged discussion with the building industry about choosing how to pinpoint that. Where we landed was associating the Tier II level with what builders in California are doing relative to the US Department of Energy's Building
America Program. So that was our branding level there.

We also expect in addition to both of these tiers for ENERGY STAR appliances to be installed whenever the builder is installing appliances. So this is kind of our point of reference that we'd come away from in setting up the NSHP program. And we're thinking about, are these concepts extendable to the other sectors that we would be having PV incentives for.

Another thing that we think is very important for the Energy Commission to seriously think through as it establishes these criteria is that you have existing efforts that have been pursued by the PUC and by the POUs that, you know, were vigorous efforts to respond to the policy direction of their decision-makers and were, you know, were well-intentioned to pursue similar goals to what the Energy Commission has pursued in the NSHP.

And that these program are in effect at the PUC and the various municipal utilities are at different levels of program but, you know, there have been a range of amounts of time that these programs have been in effect and some of them are
definitely in place and some of them are being worked on right now to be put in place.

All of these efforts, you know, there has been substantial program implementation expertise that's been developed and there's been a buy-in from the industry relative to those criteria. So we think that we should try to understand those factors and we should take comments related to this experience from the PUC and the POUs carefully in consideration as we develop the eligibility criteria.

To the extent the Energy Commission develops eligibility criteria that would cause these programs to change we think that there is a really need for there to be a transition period for that change to occur and that there needs to be adequate time for that. So a recommendation in the staff report is that the effective date for eligibility criteria that the Commission would adopt by the end of this calendar year should not be obligatory to the PUC or the POUs until January 1 of 2009.

Just finally, kind of what we had planned for the rest of the day here on the schedule. We break out the recommendations of the
staff report in three areas. Energy efficiency, and we would like to focus a little bit of attention on the benchmarking and commissioning recommendations we have related to existing commercial buildings, the installation and component standards, and then talk about the proposed effective date and guideline development schedule. So that's kind of how the agenda for the day is laid out.

For each of those topics we were expecting to have a staff presentation that would quickly go through the recommendations in the staff report and then open it up for comment. That's all.

PRESIDING MEMBER GEESMAN: Excellent.
Claudia, are you first up?

MS. ORLANDO: Yes I am.

PRESIDING MEMBER GEESMAN: Great.
MS. ORLANDO: When the staff was developing the recommendations for the residential new construction recommendation our recommendation is to extend the New Solar Homes Partnership Program energy efficiency requirements statewide.
Again, staff was trying to look at prominent energy efficiency programs that already exist and
try to co-brand with those programs when
developing these recommendations.

Our Tier I is, again, the minimum level
is 15 percent better than Title 24 and that is
consistent with the current IOU new construction
programs. And then the Tier II, the second tier,
which is the Energy Commission's preferred level,
is to exceed Title 24 by 35 percent. And that is
in total energy and then 40 percent in the cooling
energy. And that is consistent with the Building
America Department of Energy program levels. And
this is also consistent with the Public Utilities
Commission's Big Bold Strategies.

This program also requires the builder
to install ENERGY STAR rated appliances for any
appliances that do have that ENERGY STAR rating.
And then utilities should provide energy
efficiency incentives for each of those tiers.

For the new commercial construction
recommendation. Our recommendation actually is
modeled after the New Solar Homes Partnership
Program tier style. And again we wanted to co-
brand with prominent existing energy efficiency
programs and try to align our requirements with
those requirements.
So our recommendation is for Tier I, and that's the minimum level to participate to get the PV incentive, that would require projects to exceed Title 24 by 15 percent. And that recommendation is consistent with the United States Green Building Council's LEED new construction program energy efficiency requirements.

Recently the USGBC members voted to require a minimum of two points in the energy and atmospheric category. That actually equates to exceeding Title 24 by 15 percent. This Tier I recommendation is also consistent with Savings by Design's minimum incentive level for a design team in that it requires the design team to submit projects that are at least 15 percent better than Title 24.

The Tier II recommendation, which is the Energy Commission's preferred level, requires projects to exceed Title 24 by 30 percent. And this recommendation is consistent with the federal energy tax credits, which requires projects to exceed ASHRAE Standard 90.1 2001 by 50 percent. And that actually equates to exceeding Title 24 by a minimum of 30 percent.
This recommendation is also consistent with the new ASHRAE Green Buildings Standard 189. And that standard actually supports the Architecture 2030 Challenge plan. Architecture 2030 Challenge plan is a global initiative that is seeking to have new construction and major innovations, or have buildings perform to net zero energy by 2030. And in order to get that started they are requiring an immediate reduction of 50 percent of greenhouse gas emitting energy. In order to meet that challenge you would need to begin to start designing buildings that are 30 percent better than Title 24.

Again, utilities should provide energy efficiency incentives for each tier. And also that two tier, the second tier recommendation is consistent with the CPUC's Big Bold Challenge strategies.

Now making recommendations for existing commercial buildings is a little bit different, a little bit more complex. And again staff wanted to co-brand with existing efficiency programs and the most logical step was to co-brand with the Governor's Green Building Initiative. Executive Order S-20-04 requires state buildings to reduce
energy use by 20 percent by 2015 and encourages
the commercial buildings to also follow suit.

This requirement includes having
buildings, all buildings benchmark using ENERGY
STAR's Portfolio Manager. One of the requirements
to receive an ENERGY STAR plaque for a building is
for the building to have an ENERGY STAR Portfolio
Manager rating of 75.

And the Green Building Initiative also
requires buildings to do retro-commissioning if
the building is greater than 50,000 square feet.
And then also our recommendation is that buildings
with a benchmarking score of less than 75 also
need to do the retro-commissioning.

And then the buildings or the projects
need to implement cost-effective energy efficiency
recommendations up to, to move that building up to
that score of 75.

And again the utilities need to provide
incentives to complete this retro-commissioning.
And then also for installing the cost-effective
energy efficiency improvements.

For existing residential
recommendations, that's even a little bit more
complex. So to begin with staff is recommending
to continue with the CSI-required online audit. And continue that until future updates of the SB 1 guidelines that we will be developing.

and then also staff is recommending the CPUC to do an investigation of the results of the online energy audit to see what kind of measures have been installed, then we can use that information into further developing what we kind of have put together as a conceptual approach to benchmarking existing residential home energy use.

And this conceptual approach would require the utilities to develop a system to compare a home's energy use to a population of homes energy use in their service area. And we would look at the energy use by quartile and we would try to encourage homes to move and reach that top quartile.

And then for the homes that aren't in that top quartile we'd require a further investigation. These homes are of various ages, the occupant habits are varying. The homes are in different climate zones. The existing condition of the home, the type of energy efficiency measures that already have been installed in the home are varying.
So this would require some kind of an investigation. And we would recommend using an on-site energy audit to further that investigation, or it may require using a Home Energy System Rater, or a Building Performance Contractor, to determine the cost-effective energy efficiency measures that would be appropriate for that home.

And then the utilities would provide incentives to do these investigations. And each of those, the on-site audit and the HERS rater and the Building Performance Contractor, they have more diagnostics as you progress through that list there.

And then the utilities would provide incentives also to install energy efficiency improvements that were found in these investigations.

The Energy Commission also -- the recommendation is for the Commission to form a task group to further develop this conceptual approach. And then we would include that recommendation in further updates of the SB 1 guidelines.

And then next Martha Brook is going to
talk about the building commissioning, retro-commissioning and some more information on the benchmarking program.

MS. BROCK: Thank you. Okay, so just some information for those of you in the audience that aren't as familiar with benchmarking or retro-commissioning as staff has come to be.

Energy use benchmarking is a process to estimate the energy use per square foot of a building space and to compare that energy use with buildings of the same type of location and to track energy use over time.

And the reasons to benchmark your building include being able to determine how your building's energy use compares with others, to set targets for improved energy performance, to facilitate the assessment of property value, and to gain recognition for exemplary achievement. And also to begin to identify opportunities to save energy.

What we are recommending in our staff report is that we focus on the first and the last reason. To compare your building with others similar to yours and to begin to identify areas where we can improve energy performance.
The US EPA's ENERGY STAR Portfolio Manager, which is what staff is recommending, is a whole building annual energy use benchmarking tool. It compares your building to a national population of similar buildings by building type, kind and region.

The data requirements are basically a physical address, a geographic location; 12 monthly utility bills, so a year's worth of utility bills; and then the square footage of the building. There are additional features of the building that you can collect and input into the model and it improves the score, the ability for your building to be compared with others, but they're optional.

So for example, if you have an office building you would be asked to submit how many computers in your building and the hours of operation of your building. And if you're in a hospital it would be number of beds. And if it was a school it would be number of students. So those types of things would improve your ability to compare your building to others but they are not mandatory.

And then the scale of the ENERGY STAR
rating is 1 to 100. So a high rating is
equivalent to low energy use. And that is
illustrated in the next slide.

There's actually two bars and it's sort
of hard to see on the TV. I think it's a little
easier there. There's two bars for every
building. These are actually state buildings that
have been benchmarked with the ENERGY STAR tool.
And this just illustrates that high energy use,
which is in purple, is equivalent to a low ENERGY
STAR score, which is in blue.

ASSOCIATE MEMBER PFANNENSTIEL: Martha,
may I just make sure I understand. You said these
are state buildings. Meaning state of California
owned or operated buildings, not buildings within
the state.

MS. BROOK: That's right. These are,
this is part of the Green Building Initiatives and
I'll talk a little bit about that later. So these
are state of California buildings. Just a sample
of those that have been scored with the
benchmarking tool. It just illustrates what I've
explained, that high energy use is a low score and
vice versa, low energy use you'd get a high score.

The ENERGY STAR Portfolio Manager tool
works for a number of specific building types. So they have a separate benchmarking model for offices, banks and courthouses, K through 12 schools, hospitals, medical offices, warehouses, hotels and motels, dormitories, and supermarkets and grocery stores.

And they are in the process of developing a retail store model. That should be released before the end of the calendar year. And then they are also looking at separating the K through 12 school model into separate elementary school and secondary school models.

So the remaining building types not covered by the Portfolio Manager are restaurants, colleges, public assembly buildings, convenience food stores, health care facilities that are not hospitals, service buildings like gas stations, and then everything else. All the miscellaneous building types that don't fall into any of these other categories.

When staff was considering making this recommendation to use Portfolio Manager for these criteria we were very interested to know how California buildings would be scored with the Portfolio Manager tool. In California there is a
recent, commercial end-use survey, which is a
collection of about 2700 commercial buildings that
have been field surveyed. Their energy use and
many, many characteristics of the buildings have
been collected.

We used this data set and ran it through
the portfolio manager tool to, basically to see
how many in each of the building types, the
portfolio manager models, the scores would look
for California buildings.

If California building energy use was
exactly the same as national building energy use
we would expect 25 percent in each of these rows,
in this column. Basically because a 75 is
equivalent to the top quartile, the top 25 percent
of buildings.

So as you can see we are close in some
categories. I would say that the only really
outliers as we go through this is Office is
significantly close, 33 percent.

Now K through 12 schools as a whole
looks pretty good. But the problem with the
ENERGY STAR model is that it's trying to cover
elementary schools and high schools in the same
model.
And they are actually, they have already identified this as problem and they're working on an improvement to that. As you can see there is a big difference between how high school scores look, with only nine (sic) percent getting a score of 75, versus an elementary school, which 42 percent get a 75. That's just sort of an argument for why EPA is already addressing the K through 12 school model.

The other real outlier that we'll be addressing with the EPA is the supermarket model. Sixty-three percent of California supermarkets would get a score of 75 and that means that there is an area of concern for us and a reason for us to keep working with EPA to see if we can improve the ability of their model, their national model to work for California buildings.

There's approximately 40 percent of the floor space in California commercial buildings that would not be able to get an ENERGY STAR score because of the building type. For these building types Commission staff proposes to develop an energy use index, an energy per square foot index look up table from this same large sample of California buildings, the Commercial End Use
Survey.

Basically it would be an alternative to the Portfolio Manager when there is not a way to score within the ENERGY STAR tool. So then again we would be recommending the top quartile would be equivalent to a 75.

Just to give you a status update on the California state building benchmarking program. This again is part of the Green Building Initiative, the Executive Order from the Governor S-20-04. The executive order has mandated that state buildings get benchmarked by 2007 and the California Energy Commission recommendation through the Green Building Initiative was to use the Portfolio Manager to do that.

Seventy-three percent of all state facility floor areas, so basically the geographic location and the floor area information, has been input into the portfolio manager tool. It's about 350 buildings.

PG&E, Southern California Edison, Sempra and SMUD are working with US EPA to automate the monthly billing upload into the Portfolio Manager. So the idea here is that a customer wouldn't have to collect his 12 months of utility bill
information. That once a data release form is
signed by the customer the utility could
automatically send the utility bill information
and it would be uploaded into the Portfolio
Manager tool.

And then finally the energy use
benchmarks. So the utilities are collaborating
with EPA and working diligently to work out this
process and they are probably going to complete
that by September and the energy use benchmarks
for these buildings will be reported by December
of this year.

So I think the most important thing here
is this ability to automatically upload data. It
makes actually benchmarking California's
commercial sector a realistic option now because
it really streamlines the process and allows the
utilities to really make a great step in helping
them customers get a benchmark for their building.
So we're really happy about that.

Now I'm going to turn to retro-
commissioning. Again, just sort of what it is and
why do it and some of the costs and benefits of
the process. Retro-commissioning is a systematic
process for improving building performance by
identifying low-cost operational and maintenance improvements without the need for complex and expensive retrofits.

So the process focuses on looking at the operation of mechanical equipment, lighting and related controls and trying to optimize the equipment to operate as a whole system. So really look -- going into a building, looking at what's there and trying to optimize the performance of that building and making recommendations to do that.

It doesn't include retrofit items such as installing high efficiency lamps, chiller replacements or air conditioning system replacements. It is really meant on low-cost, no-cost measures and optimizing system performance.

The core elements of a retro-commissioning process is to ensure that the building is performing as efficiently as the owner expects.

To recommend and implement measures that improve equipment performance.

To verify that the owner and staff receive documentation and assistance to implement the improvements. And training on the monitoring
and maintaining of the improvements so that they can persist over time.

And finally to provide the documentation and tools to enhance day-to-day operations and maintenance practices.

The retro-commissioning costs range from ten cents to one dollar per square foot and it depends on the number of scope of the retro-commissioning process. So the number of systems that need to be investigated and optimized, the complexity of those systems, the number of zones in a building, the scope of the improvements that are recommended and also the owner's involvement all contribute to the range of those costs. And the owner involvement is really key because the idea is that you're improving the building performance and leaving the owner with that building and you want him to have every tool he has available to him to maintain the well-functioning building.

In California a typical range of energy savings is 5 to 20 percent and paybacks of two years or less are common.

The California State Building Retro-Commissioning Program, again part of the Green
Building Initiative. The goal was to achieve 20 percent savings in existing state buildings. Eight percent of that is targeted to be achieved from retro-commissioning and 12 percent from energy efficient retrofits. So the retro-commissioning process is separate from the energy efficiency retrofits and they're really targeting eight percent energy savings from just the retro-commissioning low-cost/no-cost measure improvements.

Twenty-five retro-commissioning projects are underway within state buildings. One building is complete to date and almost eight percent energy savings has been achieved there.

The manager of the retro-commissioning program for the state has got projected energy savings for 11 of those 25 buildings and there is an average savings projected of almost 12 percent and two to three year payback is anticipated.

Next I just wanted to mention that three of the large IOUs in the state have active retro-commissioning programs. Southern California Edison and San Diego Gas & Electric have targeted retro-commissioning programs. You probably can't see the link there but I can share that with you
if you're interested in it.

And then Pacific Gas & Electric has integrated retro-commissioning into their market sector initiatives for large commercial, medical facilities, high-tech facilities and hospitality.

And then finally I wanted to mention that the California Commissioning Collaborative is a California nonprofit organization that focuses on providing information to building owners and commissioning providers to facilitate commissioning and retro-commissioning in the state.

One of the things that the Commission was charged to do in the Green Building Initiative was develop commissioning guidelines. We asked the California Commissioning Collaborative to complete this work for us. They've developed the California Commissioning Guide for new buildings and existing buildings and the existing buildings is the one that I prepared on the slide. Copies of these will be made available out on the front table after today's workshop.

Basically the intent of the guide is to get information to building owners to answer the following questions: What is retro-commissioning
and why should I use it? What are the benefits and costs of retro-commissioning? What happens during the retro-commissioning process? Who should be part of the retro-commissioning team? Can the benefits of retro-commissioning persist over time? And how is the best way to get started with a retro-commissioning project?

So the California Commissioning link is also on the slide and you can get lots of information for building owners about case studies, sample specifications for various scopes of commissioning, lists of commissioning providers in the state and lots of other information is available there. I think that’s all I have. 

PRESIDING MEMBER GEESMAN: I've got blue cards. Is it your desire that I proceed now or?

Okay, why don't I just start with the stack that I've got. David Rubin, PG&E.

MR. RUBIN: Commissioners, good morning. I'm assuming I have three minutes, correct?

PRESIDING MEMBER GEESMAN: You have as much time as you need but three minutes would be greatly appreciated.

MR. RUBIN: I can do three minutes, thank you. On behalf of Pacific Gas and Electric
Company we appreciate the opportunity to provide comment this morning and this afternoon.

I would first like to start by commending staff on a thorough and well-thought through report that is the basis for our comments this morning. I am going to provide high-level comments now and will provide written comments in a week.

As a general matter PG&E is a very enthusiastic supporter of the California Solar Initiative as well as being a program administrator. And in that regard we appreciate the balance to be maintained between implementing the various objectives of SB 1 as well as ensuring that we have a program that is implementable and achieves a high level of customer satisfaction.

So in that regard the various tenets of SB 1, which is implementing 3,000 megawatts of solar, providing a strong linkage with energy efficiency, and then ensuring that the ratepayers that support the program through the rates they pay are getting real renewable value out of the projects. Again, really achieves a very careful balance.

And as we have learned at implementing
essentially phase one of the CSI, the additional
requirements that have been put into place have
also introduced additional complexity in the
program implementation. And so we have worked
hard over the course of the last several months to
identify areas where there are opportunities for
limiting the amount of paperwork associated with
the program and we've proposed some changes to the
PUC, which we now have a draft resolution
approving.

We just want to make sure that as we
step into the next phase of the CSI that we be
mindful of additional complexities associated with
the implementation. So while we support, again,
the staff report for essentially moving the ball
forward with respect to ensuring that tighter
linkage with energy efficiency in particular, we
would want to make sure that what is put into
place really is essentially thought through,
involves the necessary training for the market
participants so that they could actually implement
them, and do not represent an additional burden
that mind end up in some sense perhaps
jeopardizing the broader goal of 3,000 megawatts
statewide of solar.
And so just to provide a little more detail. We believe that the new construction elements of the program, again, make sense. The additional levels of efficiency that would be required for residential and nonresidential buildings.

And with respect to retrofit, we think that the nonresidential objectives are workable in the sense that our account reps in working with nonres customers typically pursue an integrated approach and the additional requirements that are represented here are things that we think we can work with.

We're a bit concerned based on what we have been able to understand so far with respect to the residential retrofit in particular. And while we again support the objectives of a tighter linkage with energy efficiency measures we're concerned even with the one year timeline that's described in the report that it may be difficult to put the type of system into place.

Obviously the devil is in the details with respect to how you define cost-effective. But we do want to take the opportunity to think through if there are different ways of getting,
again, a tighter linkage in a manner that might,
for example, focus on larger homes, at least at
the outset, as opposed to all of our residential
homes.

Considering, for example, the cost of
doing audits in all of the homes that are below
the 75th percentile as is established would be
costly. And then again, how you define cost-
effective obviously will be very critical in terms
of the achieveability of these additional
measures.

So I'll limit my comments for now and
will provide again more substantive comments
later. But we appreciate your efforts and I'm
happy to answer any questions if you'd like.

ASSOCIATE MEMBER PFANNENSTIEL: Thank
you for being here, David, we appreciate your
input. I think it is really important to all of
us that we avoid unnecessary layers of paperwork
and complexity and so we look forward to your
input on how to avoid that. We know you share
with us the concern about making sure that we both
meet the criteria of the statute but also make
these programs as efficient as we can make them.

You know, hard to balance sometimes. So
look for ways to help us in terms of meeting that
but not putting an extra burden on either the
solar developers or the builders or the
homeowners. I think we really have to balance
that so we look forward to your comments.

MR. RUBIN: Commissioner, thank you.

PRESIDING MEMBER GEESMAN: Utility
incentives were an important part of encouraging
the staff in their efficiency objectives in new
construction. Do you envision assembling a
package of utility incentives for energy
efficiency in the retrofit sector?

MR. RUBIN: As you're aware we do have a
broad base of various types of efficiency programs
for all the various market sectors. One part of
that is not on-site audits for residential
customers, for example, so that would need to be
brought into focus as well. But in general yes, we do.

PRESIDING MEMBER GEESMAN: Thank you.

MR. RUBIN: Thank you.

PRESIDING MEMBER GEESMAN: David Bruder,
Southern California Edison.

MR. BRUDER: Good morning. I also
wanted to commend the staff on their work on this
report, very well written, very clear articulation of the differences between programs and set of recommendations about how to go forward with compliance for SB 1.

Edison wholeheartedly supports the staff report recommendations regarding the energy efficiency requirements, especially for buildings receiving incentives under the CSI program. These requirements are consistent with our belief in the benefits of integration of all customer energy management solutions. That's energy efficiency, demand response and solar, in the order called out in the EAP loading order, resource loading order.

We recognize also, as David mentioned, that this adds complexity and cost to the program, to the solar program and to customers doing solar. We plan to provide a significant level of support through our energy efficiency programs to basically meet the requirements and assist the industry, assist our customers in meeting these requirements.

Our energy efficiency programs are -- beginning in 2006 are very much in line with the requirements that are called out in the staff recommendation. We have energy audits both for
residential customers and for nonresidential customers. We have a $15 million retro-
commissioning program that also includes ENERGY STAR Portfolio Manager benchmarking as a component. And of course both our residential and nonresidential new construction programs are in line with these requirements.

So we're mindful of the complexity but, you know, again our intent is that we can provide the support to the industry and our customers that's needed to comply with these requirements.

So the requirements will impose some additional costs and administrative requirements on the energy efficiency side. Probably both, actually both programs. And we expect that those additional costs would be covered either through the CSI funding or an energy efficiency program funding.

And also we hope and expect that the CPUC and the CEC will support and back the energy savings that occur through the energy efficiency requirements for solar installations and that essentially they won't be considered free riders in the process.

So again thank you for the opportunity
to comment and if you have any questions I'm happy
to answer them.

PRESIDING MEMBER GEESMAN: Thank you
David.

MR. BRUDER: You're welcome.

PRESIDING MEMBER GEESMAN: Andrew
McAllister, California Center for Sustainable
Energy.

MR. McALLISTER: Thanks for the
opportunity to put forth some comments. I agree
with the first two speakers that this is really a
fantastic document and there's a lot of great
ideas in the air, interesting ideas, and really
look forward to participating in the discussion as
it moves forward.

Just as some background, CCSE, we used
to be called the San Diego Regional Energy Office.
I think we're driving that home in everybody's
head these days but just to drive it home once
more. We support clean energy in the San Diego
region and beyond by providing technical
assistance and program administration services and
other services. And our core competencies really
are energy efficiency and renewable energy. And
of course we're the program administrator for the
solar initiative down in San Diego and in the SDG&E service territory.

Energy efficiency and the loading order are wonderful tools the state has at its disposal to promote long-term sustainable energy and we fully embrace the loading order and everything that flows out of that.

Additionally Bill mentioned the zero energy home goal and we very much, I personally am and we as an institution very much support that. In fact, CCSE is offering a solar water heating program now that sort of goes along with that general goal. I mean, you can't have a zero energy home without solar water heating. It's kind of the third component along with efficiency and some kind of electric self-generation. So that whole package is really important, I think, to keep in mind.

As Claudia and the staff report recognize, the existing buildings present particular challenges and I'm going to focus on those in my brief comments. It's a complex sector, it's varied and the measures really do need to be customized for that market. So the challenge is how to go about that in an effective
and efficient way.

I think benchmarking and targeting makes a lot of sense. It's worked in a lot of sectors and countries throughout the world and I think has really been proven to make a lot of rational sense. The question is how to do it cost-effectively.

As the California solar initiative responsible for ensuring that program requirements are met CCSE would expect and participate vigorously to be integrally involved in the development of the process for how to develop and apply the benchmarking and targeting. Because it's important actually not just probably for the solar initiative but in general for efficiency programs and policy going forward. So to develop the processes and requirements, to really make it operational and effective I think is important.

I want to point out that the San Diego region is a little bit unique. I'm a transplant from the Bay Area, from Berkeley. In the two years I have been down in San Diego I've realized how sort of different it is, Southern California and Northern California, and many of you know this already. But I just it bore mentioning.
Well first we have lots of sun so it's really a great spot for high performing systems. If the state's policy is to meet goals with solar generation on a performance Southern California I think is a very good place to do that.

On the market side of it, San Diego and I think Southern California in general is fairly different from say the Bay Area. And sometimes I feel like I need to say this explicitly. Everybody sort of knows it but I need to say it explicitly. The overlap between energy efficiency adopters and PV adopters really isn't assured like maybe we assume it is. You know, oh gosh, if they drive a Prius and they have energy -- they're probably doing energy efficiency and they're probably going to do solar, that kind of thing.

Well our installation base in the CSI is actually somewhat counter to that intuition. We have relatively large average system size and we see a lot of the residential facilities in general, in particular that are not that concerned. They're seemingly not that concerned about energy efficiency or an eco-lifestyle or sort of living green and sustainably. They really are making PV a statement sort of apart from many
of the other considerations.

So I think that this assumption, or at least the danger might be that we sort of hold PV installations somewhat hostage to some pending energy efficiency installations and therefore, you know, we're not making sure we have all policy, all technical options for reducing greenhouse gases moving forward in parallel. We're sort of having a serial approach rather than a parallel approach. So I think we just need to keep mindful of that as we work through these new requirements.

And I also very much agree with that we need to study the participants in the market to make sure we understand what's going on with energy efficiency and the characteristics of solar adopters.

And just to finalize, we very much look forward to working within the energy efficiency portfolio. We are third party -- We have been the third party administrator of energy efficiency programs for a large number of programs. So we look forward to further participation within the energy efficiency portfolio for our region and with other regional stakeholders. Obviously SDG&E the local utility but also municipalities and
working with them to enforce --

Say Berkeley and San Francisco, when a	house changes hands you know they have to, they
have RECO and all that sort of thing. Trying to
get some of these policies that really grease the
skids for getting energy efficiency done
independent of whether or not a house may be
receiving an incentive from a CSI program.

So, you know, we think both of these
goals are wonderful and are very much committed to
both of them. We'll do our best to make that work
as the administrator down in San Diego so thanks.

PRESIDING MEMBER GEESMAN: Thanks for
your comments. I think you make some important
points, particularly with respect to retrofit
energy efficiency. You know, 25 years ago we came
within two votes on the floor of the state senate
requiring a retrofit obligation at the time of
sale on a statewide basis. It was initiatives at
the local level that I think prompted the
California Realtors Association to want to see a
statewide requirement.

MR. MCALLISTER: Well I think the
municipalities are really in a great position to
do that. And we do have several municipalities
down south, in particular San Diego and Chula Vista, the two largest cities in the county, that are very committed to getting their greenhouse gas emissions down. They have working groups really doing substantive work on these issues and are definitely open to these kinds of policies for sure.

The City of San Diego, as were a couple of other cities in California, was awarded a solar America initiative -- a solar cities strategic partnership award from the DOE to work on some of these very issues. About looking at what policies can help them reduce their carbon. We're a subcontractor on that to the city.

So I think there's a lot of exciting things going on and they play into this debate that we're going to have, this discussion we're going to have about this document because I think there's a huge opportunity to integrate many complementary goals in a way that's efficient.

Obviously our concern, which I think I heard in the first two speakers, particularly PG&E, is that we don't want to create artificial bottlenecks. We want to make sure that it's a seamless, efficient, transparent kind of process
and that we don't sort of rob Peter to pay Paul kind of thing. So thank you.

PRESIDING MEMBER GEESMAN: Thanks for your comments.

ASSOCIATE MEMBER PFANNENSTIEL: Excuse me. Does the City of San Diego have a requirement for an energy efficiency audit at time of sale?

MR. McALLISTER: I believe they do not.

ASSOCIATE MEMBER PFANNENSTIEL: Thank you.

PRESIDING MEMBER GEESMAN: Bob Knight, California Building Performance Contractors Association.

MR. KNIGHT: Good morning, thanks for this opportunity. We made six pages of written comments so I am not going to try to go into detail here but I would like to provide a little bit of perspective. By the way, since we ran out of copies of those this morning we'll put that on the CBPCA website, cbpca.org and anybody can get them there.

I'd like to just say a few words about the perspective on existing homes. First of all the existing housing stock, the homes that are already built today are going to dominate the
housing stock for the rest of the lifetime of everybody in this room. Not enough attention is being given to existing homes. So we want to go forward with that idea that improving the energy efficiency of existing homes as well as adding solar PV to those homes is of paramount importance and I wouldn't want to see any kind of reduction in the emphasis on energy efficiency.

Also a little bit about the importance of comprehensive home performance improvement. The home performance concept, which integrates both shell and mechanical improvements to the house, generates savings, energy savings that are far greater than individual measures can ever accomplish. So we think that this is an important part of any portfolio.

Also the importance of offsetting the cost of photovoltaic systems with energy efficiency improvements. If you put four kilowatts of solar on a typical house, which is about the amount that is going to be needed to reduce the peak, to get rid of the peak spike in the summer in most homes in the Central Valley, it is going to cost you in the range of $40,000.

A home performance assessment and
comprehensive improvements will cut that cost in half. So it's a better expenditure of the $40,000 to do part of it on energy efficiency and reduce the cost of the solar. You get better results or you can spend less money.

Also a word on the limitations of the cost-effectiveness idea, the cost-effectiveness criteria. Surveys that we have done of people who have had major improvements in energy efficiency done to their house indicate clearly that most of their motivation is for forces and purposes other than saving money on their utility bills.

Therefore it is questionable to depend heavily on a cost-effectiveness criterium that involves the expenditure made by the homeowner. It's apples and oranges. The homeowner is making the expenditure for many other reasons. And the only benefit that we're putting into that cost-effectiveness criterium is the amount of money that is saved or the amount of energy that is saved when in fact there are many other benefits that are completely ignored in the typical cost-effectiveness calculation such as the photo-resource cost test.

Finally the educational opportunity for
energy efficiency that is implicit. The great
opportunity in the California Solar Initiative.
We would not like to see that diminished in any
way. And we think that the information that is
provided to the California population about the
CSI and how to go about taking advantage of it
should include a lot of information that shows
people what their choices are in improving the
energy efficiency of existing homes.

So with that background and perspective
I'd like to say that we generally endorse very
strongly the ideas in the staff's conceptual
approach to this subject. Not in its details but
certainly in its intent. We have some suggestions
to make that we think could improve it. I am not
going to go into those in detail, they're in the
written comments.

The basis of that approach, that we
appreciate the staff's words on is the division of
the population of houses into four quartiles
according to energy use and a stronger focus on
what I think of as the top quartile. What I think
Claudia referred to as the bottom quartile but to
me the top quartile in energy use makes it a
little easier to remember. That's a very easy
measure because the utilities already have the data.

We don't think -- This is a detail I want to just briefly mention. We don't think that energy use per square foot is the right measure, we think total energy use is the right measure. Because it doesn't matter whether a gross polluter house is that way because of its size or its deficiencies or the behavior of its occupants. It is still a gross polluter and that should be corrected. And the best measure for that is how much energy is it using.

We believe that we're missing an opportunity here with the staff's conclusion that in 2009 we still would be doing nothing but an online energy audit. We don't think that's enough. And we think it's possible administratively to do more than that much faster than that.

We recognize limitations on staff time and the difficulty of all the details that the utilities have to go through but we're involved in that process. And we know that they can do it. There are 16 months between now and the beginning of 2009. We think that's ample time to actually
implement something that could actually create
real energy efficiency instead of just an audit,
which historically every evaluation I've ever seen
indicates that they are of marginal value.

And if for any reason there isn't a
possibility of shortening the time span from 2009
back into the middle of 2008 or something like
that we think we should have an interim
improvement in the existing standard that would
involve requiring homes to make at least some
minimal level of improvement. And
administratively we've outlined how that can be
done with minimal effort in our comments that
we've submitted.

We proposed a specific program design
that is closely related to the staff's concept.
It is easy for low-use homes, almost falling off a
log easy, for the lowest quartile, a little harder
for the homes in the middle and quite a bit harder
for the homes at the top. It's all easily
administered as well as understandable to the
homeowner. And it can be implemented we believe
well before 2009.

So in conclusion I'd like to say that
the CBPCA, based on our experience in doing home
performance programs as we are now statewide for both PG&E, Southern California Edison, Anaheim Public Utilities, speaking with other utilities about the same programs and extensions of our present ones. We endorse the staff's concept. We encourage much quicker action and implementation that will actually really generate energy efficiency improvements on a large scale. Thank you.

PRESIDING MEMBER GEESMAN: Thank you for your comments. Dan Perkins, Energy Smart Homes.

MR. PERKINS: Thank you for the opportunity to say a few words. I agree with the previous speaker that we really need an in-depth look at what it is that can be done. The wheel has already been invented. We have some loose spokes but let's tighten it up and let's make what we have in the way of a HERS rating work for us.

San Diego has been a leader in this kind of thing as well as Sacramento. Bobbi Glassel has been in this business for a long time. She'll explain exactly where the rubber hits the road when it comes to a HERS rater. But the HERS rating is going to be the criteria that we're going to bank on in order to make the decision on
what needs to be done.

You cannot start making little decisions for homeowners out here. They are not, they're going to rebuff. So if they have the rating in their hand they can then make the decision that $8,000 that they spend on energy efficiency will save $15,000 in solar. And that is going to be an important thing for that consumer to understand.

So we have a big education program that needs to take place. We are in a position to be able to make those education programs happen through the Department of Real Estate in the course that Bobbi will speak to.

So we're ready to go. We're looking forward to working with you. We appreciate the work that's been done. We want to help in any way that we can. We're here to answer your questions.


MS. GLASSEL: Good morning, Commissioners. I think we all agree with the energy efficiency and the solar, who is going to write the check? This is a very expensive thing for a homeowner to go energy efficiency and solar.
I have kind of gone along with AB 549 and I know that they are in the process right now to conduct a complete HERS proceeding for the rating. They're trying to develop training materials and to design the HERS disclosure at time of sale. And I have to tell everybody in the room, this is a very powerful tool that we have, the disclosure of the HERS rating.

When this comes out, not only EE but solar, you are going to have a massive sales force. There's 536,000 licensed realtors in California. That's one out of 50 people have a real estate license in California. Like that? Want to buy a house? And another thing too, I am not a realtor, I am not a lender. I work with the homeowner, the mortgage lender, escrow, the contractors to put together energy efficiency packages. So don't ask me any lending questions.

We need to layer together our new and existing programs. We need to finish up what we have going. I'm in the trenches. I'm out there every day with homeowners. They want energy improvements.

I have been in the real estate business for about 27 years. For the last 11 years I have
been doing the energy efficient mortgage. In those 11 years when I have told the homebuyer or homeowner they have an opportunity to get energy improvements, and this is just my word but please believe me, I've only had five or ten people say they are not interested. They are interested.

Once I've ordered a HERS rating. And I will tell you, all energy efficient mortgages, every loan product requires a HERS rating for justifying the financing. Once I've ordered a HERS rating and that homeowner has seen the HERS rating I have never been turned down on energy improvements. Not once.

It's not cheap, like I say. People cannot whip out a checkbook. I can't. I don't know how many of you here can and pay $8,000 for a new heat and air. Maybe I want some attic insulation. Maybe my house needs new windows. We're going to finance this, not counting the solar of course. It's going to be financed.

Those folks of you who are not familiar with energy efficient mortgage, it's a nationwide program that Jimmy Carter started. It is not a loan. Once a buyer qualifies for energy improvements -- excuse me. Once a buyer qualifies
for their mortgage, they've already qualified for it, they automatically qualify for cost-effective energy improvements to be layered into that first mortgage with no additional income qualifying, no additional money down. The appraisal increases in the amount of the energy improvements.

Is this hard to do? No. Cookie cutter, no problem. It's not hard for the lender, especially when he has me. It's not hard for the underwriter. They just push a button and it's done on DU, Desktop Underwriting.

The HERS rating is our first criteria for energy efficiency before solar. Online that's a nice little thing. I'm going to tell you, nobody knows how much attic insulation they have. They do not know how old that heat and air is and what SEER it is. Their hot water heater, it gives them hot water, they don't know how many gallons. Some of them don't even know if it's gas or electric.

The HERS rating before solar will relieve the contractors, the solar contractors. Let me see where I'm at. The responsibility of confirming and verifying existing energy improvements in a home. Will not slow down the
installation or the rebate program. Offers the consumer a cost-effective and wise information so they can go out and purchase the correct products for energy efficiency.

In California our raters, and I'm not going to tell you this but they're getting about $300 a rating and that goes up from there. It's not prohibitive. It's in place and working. And it can be driven by the real estate market. It's consistent statewide. In fact I think CalCERTS has a rater in every county in California. The rating would produce -- The HERS rating will produce energy efficiency.

I am also approved by the Department of Real Estate. I give a DRE class, Energy Efficiency Regulations and Financing.

And you've heard -- Every time you read about real estate ratings, trying to sell, one of the barriers is always the realtors and the mortgage lenders are not interested. Next time you come across that cross it out it's not true. I'm telling you it's not true.

In my class I hand out a questionnaire. And some of these answers, one to ten, they're all tens. Would you get a rating, yes. Would you get
a rating on your new home. Would you recommend it. It's all yes. They are ready to go.

Money talks. This is something that did up to show, not you but I give this in my DRE class. I didn't do it for you. If a family has energy efficiency they upgrade their heat and air -- And by the way, the HERS rating is real easy to read. It just says, existing conditions, what the rater wants to improve those conditions, annual savings. Really cut and dry.

This particular one they updated their heat and air. They did an additional thermostat. Test and sealed their air ducts and installed a whole house fan. Their monthly energy savings was $132. The increase in their payment was $48. That left them $84 positive cash flow.

They got a rebate of $875. That's a one-time savings. An IRS tax credit of $500. Their energy savings for the year was $1587. But because the energy improvements are part of their mortgage that interest is tax deductible. They deducted $438 on their taxes at the end of the year from their mortgage.

First year. Now they have brand new heat and air. First year savings in that family's
pocket was $3,442. That's a lot of money to a family. And it is very easy for us to obtain it. I know --

PRESIDING MEMBER GEESMAN: Why don't we wrap up in the next minute or so, Bobbi.

MS. GLASSEL: Okay.

PRESIDING MEMBER GEESMAN: I have a large stack of other cards.

MS. GLASSEL: I just have to say that FHA is rewriting. They've made the energy efficient mortgage a priority. We have two lenders. Citibank has given priority to the energy efficiency mortgage. They're going to give rebates of $1,000 on the closing costs.

But I think if we do the HERS rating I would like to see it on existing buildings just the rating required. Once they order the rating then they can figure out what they want with not a lot of hoops to jump through.

PRESIDING MEMBER GEESMAN: Thank you for your comments.

MS. GLASSEL: Thank you very much.

PRESIDING MEMBER GEESMAN: Peter Brehm, Infinia Corporation.

MR. BREHM: If it pleases the
Commissioners, my comments are most appropriate after the next section.

PRESIDING MEMBER GEBSMAN: Okay, that would be great. Erin Clark, Regrid Power.

MR. CLARK: My name is Erin Clark and I work for Regrid Power, a solar contractor. I believe that energy efficiency requirements are necessary. Having a more efficient home, yes, definitely will cost you less at the end of the year.

In real world terms, implementing more stringent requirements I think will slow down the installation of solar. For this group here I would love to see them raise their hands, who actually has a solar system on their home. I think that's pretty low for this group of people. This is a pretty advanced group here. If we make it harder for people --

It's dollars in real world. I go out there, I sell, I've installed, I've done the whole works. When you go out and talk to a customer it's a new technology, you're trying to convince them. Yes, you'll have a lower bill, you'll have this.

Having them go through more hoops, more
jumps, multiple, multiple inspections. The building department is going to come out and inspect it. You're going to have the CSI inspector home out. You're going to have now an additional inspector come out. I think it will slow it down.

You can't change people's habits. So trying to change what they're doing. If they're going to leave the lights on they're going to leave the lights on. You're going to have a more efficient light but they're still going to leave it on.

And I believe that this will, like I say, slow the process down. We want to achieve a million solar roofs and it's going to be very tough. I love the CSI program, it's a big improvement from the previous program. Orientation, performance based, very, very well thought out. That's exactly what we need. But having more restrictions is going to be very tough on our customers and I think they will --

It's dollars. It'll cost them more to, especially the New Solar Home Program. Now we're going to have to, we have certified plans examiners go through the plans. That's an
additional cost. On a new custom home we can get the plans from the builder. The homeowner now has to pay a certified plans examiner to calculate their Title 24. So they're going to pay this rating and their house might not meet energy efficiency requirements. So they're already out. They don't want to spend the $3,000, $4,000, $5,000 to upgrade it. They're already maxxed out. And they're going to spend $300 or $400 to get their plans examined. I think the program is good how it is and it will slow down by making it any more stringent.

PRESIDING MEMBER GEESMAN: Good points. But as is often the case, when the Legislature gets involved in this stuff they like to attach a lot of strings to public money. That's why we're here trying to sort through how many strings and what should be attached to each string. But I hear your point loud and clear.

MR. CLARK: It's a good program. The implementations they have done with the new program are appropriate. Now it is orientation to geographic location, shading, definitely good. But when you get out to Central California or you get out to a different
environment than in this room where people already
have those ideas in their head, people here are
going to make energy efficiency improvements in
their home. They're going to recycle, they're
going to do their part. Try and sell that to the
35,000 people in the Central Valley or in
Porterville or Tulare or wherever. It's not as
easy as you make it sound.

Mortgages. There is the energy
efficient mortgage company. How many of those are
there? You go to the cheapest rate that you can
possibly find. Everything else is -- So it's
really money. This makes it a little more
expensive. Adding more strings. And it makes it
harder to achieve the goal. Thank you.

PRESIDING MEMBER GEESMAN: Thank you.

David Wind, Sundowner Homes.

MR. WIND: Thank you very much. I'm
surrounded by diplomats. I'm not one. I've been
in the building industry for 35 years. I started
out in geodesic domes. Now my company, Sundowner
Homes, in late 2005 we started a project, 48 lots,
48 homes, all of them with solar. We've got 22
homes finished.

In our last application to Southern
California Edison it was rejected. They said well, these are new homes. You'll have to go through the New Solar Home Partnership. I reviewed it, it's a deal-breaker. I don't know what I'm going to do. I've got 28 left and I'm just stuck. I have to change all my plan specs, submit a ton of paperwork, get more inspections, jump through more hoops. It's basically dead.

I called the New Solar Homes Partnership and asked, how many developers have signed up? One. One. How many homes? My solar contractor, the last custom home that he submitted was application number 16. At the rate this is going it will take 2,000 years to get a million homes (laughter). I'm just a little guy but the big guys aren't going to jump through these hoops.

People don't buy homes because of solar power or energy efficiency. Up to a point. They buy them, they buy what they can afford in a location that they desire. My own house, which is in my own subdivision, my electric bill last month, July, was 95 cents. I don't exceed by 15 percent Title 24 calcs. None of my -- Well, a couple of my houses depending on the orientation do.
But the people that moved in, I mean, their bills are like $3.20. You know. Why do I have to go through a whole other layer of bureaucracy to do what I am already doing? And a lot of people aren't going to follow me. They're not going to do it. It's costly, time-consuming. It doesn't help. It discourages builders, it doesn't encourage them to do this.

Fifteen percent more efficient or 40 percent more efficient, plus solar. A ton of money. And across the street a same size house, you know, reasonable, meets Title 24, and it's $20,000 less. Forget it.

So I'm stuck. I'm right in the middle of a project and now I've got to disassemble the thing, put it back together and join a new program. Where is the grandfather clause? What about the guys like me that are already ahead of the curve? That's a question. Is there an answer?

ADVISOR TUTT: You can meet with our staff.

MR. WIND: Do you actually know how many homes have been done under the New Solar Homes partnership or how many developers have actually
signed up for this deal?

PRESIDING MEMBER GEESMAN: I know what
our staff has told us. I don't know myself.

MR. WIND: Your staff told me one
developer. And my solar guy said that his
application was number 16. There's 150,000 homes
built every year in California.

PRESIDING MEMBER GEESMAN: The last
information we received from our staff was
different than that.

MR. WIND: Well that was the information
they gave me last week on the phone. But I'd love
to know. Anyway, thanks a lot.

MR. PENNINGTON: So let me update the
information here. There has been a very slow
pickup from the beginning of the program until now
and those were almost all custom homes in the
first few months. There has been a dramatic
upswing in participation over the last couple of
months. And I think we're at 800 homes now.

MR. WIND: That have been approved?

MR. PENNINGTON: That are in the
reservation process.

MR. WIND: Well yeah. No, I heard that,
650 homes in the pipeline is what I was told. One
developer on board and 650 homes in the pipeline. I mean, it's minuscule.

MR. PENNINGTON: So there's eight developers that have come in under the reservation process. So this is dramatically changed since you first asked the question.

We're in this big upswing process, which is what we expected. That it's going to take developers a while to figure out what to do, you know. We're getting into the construction season. During the first part of the year we weren't in the heavy construction season. We're also facing a real downturn in the home building market. So there's been a big change here over the last few months. So that's the only comment.

MR. WIND: And thank you very much, Commissioners and staff. I just, I want to urge you to take a really close look at what you've already done. It wasn't broken. I was going along fine doing my job. A lot of other people like me were starting to think in that same way. I'm a big proponent of it, always have been. But this, what's happened now is a deal killer for a lot of us.

And if it continues into the existing
home market there will be no chance for a million solar homes. I mean, do you really want a million roofs or do you just want more bureaucracy. It will fix itself. I mean, people will do it, it's a great idea. But why stop it. And that's what's happening. Thank you.

PRESIDING MEMBER GEESMAN: Thank you.

Matt Golden, Sustainable Spaces.

MR. GOLDEN: Thank you, Commissioners. My name is Matt Golden, I'm with Sustainable Spaces and we are actually a building performance contractor. We work throughout the entire Bay Area.

And I just wanted to really stress to you guys and say, it's time to be bold, you know. We've gone through this market creation process in solar. I was part of it. And it was very necessary to really subsidize solar and make the market happen.

And we're in the process right now where -- I don't know the state numbers but there's over 150 solar contractors in the Bay Area that are on the list. And maybe 60 of them that are really active.

We all at a fundamental level I think
know that the process that has the macro impact, that has the biggest impact for ratepayers, for the environment, for homeowners, is to address efficiency and underlying issues first and then put a much smaller, more appropriately sized renewable energy systems as a next step towards zero energy.

And we understand that if you look at it, if you look at the dollars that go into subsidizing production systems, I think there's a recognition if you really look at it objectively that right now efficiency and solar, when you include the incentives, look pretty similar. But it's because there are such massive incentives on the solar side.

We really almost never use the rebate programs even that are on the efficiency side because they are more arduous than they're worth for the kind of projects that we're doing when we're looking at whole systems.

We in the Bay Area right now are actually experiencing just the opposite of what you're hearing here. We work with probably three out of the top ten solar contractors in the state in terms of residential construction and maybe a
dozen solar contractors.

They're coming to us faster than we can actually work with them. We're actually literally putting the brakes on these programs because we're trying to expand to handle the demand that they're getting from their customers for a more integrated approach. And that is honestly what is happening.

They're paying for us to go out and inspect their customers' houses right now as part of their process. They're taking that on and paying us to do that as a differentiator because there is actual demand in the marketplace.

We also have contractors that are actually building into their contracts allowances for energy efficiency right now on the front end because it differentiates them, it helps them sell solar, and their clients know they're getting a better product. And so this is the leading edge of what is happening in the marketplace.

But to just push this back and to say no, you know, we're going to wait for the market to mature. It's a chicken and egg game. And we're on the wrong side of it.

It's time to really demand market creation to get behind efficiency, which we know
is the right course. We know that we should be
doing efficiency first, then production systems
and really take some bold steps in that direction.

    And the market will come along and
homeowners will understand it. And they'll be
getting more value because they'll be getting a
better deal from a dollar standpoint but they're
also going to have healthier kids, a more
comfortable house, a better overall system. And
it's a better value proposition, it's not an
inhibitor.

    It is a change in the way that this
market is going to work. But you're going to
create a better product that serves homeowners
better, serves ratepayers better and does better
for the environment at the end of the day.

    So I just encourage you guys to be bold
and don't be afraid to take bold action and the
market will catch up. Thank you very much.

PRESIDING MEMBER GEESSMAN: Thanks for
your comments. Mark Gaines from Sempra.

MR. GAINES: Thank you, Commissioners.
I am Mark Gaines, director of customer programs
for both SoCal Gas and San Diego Gas & Electric.
I am responsible for the energy efficiency
programs and demand response programs of both utilities. I appreciate the time to talk here this morning and I do want to say that we support the staff's recommendation for SB 1. A few goals and that it certainly is consistent with the energy action plan. It does properly prioritize our customer incentives with energy efficiency first followed by photovoltaics.

From a personal standpoint I am responsible for meeting all the energy efficiency goals at both utilities that are very aggressive and any help we can get to meet those goals is greatly appreciated.

A couple of suggestions we do have. You might want to look at differentiating on the residential existing, existing residential customers, both multifamily and single-family. We think there's differences in approach that would be appropriate for those two different market segments.

And secondly going back to the loading order. There's discussions here about energy efficiency programs. We also think we ought to discuss the demand response programs that are available.
We think that does diminish the peak load obviously for homes and can reduce either the need for photovoltaic or certainly the value that is transmitted back to the system at the peak time.

So on the residential side all three investor-owned utilities have air conditioning cycling programs available, smart thermostats are coming in the future.

On the commercial/industrial side we have numerous programs, either rate or incentive programs that are available to customers that they could participate in.

We have a goal of five percent reduction of peak load at least available for demand response. It seems like that might be a reasonable expectation for customers that are participating in that photovoltaic program to also deliver that.

With that, that's our basic comments.

We do support the general direction.

ASSOCIATE MEMBER PFANNENSTIEL: Thank you, Mark. Kenny Stein. Not here. Mike Bachand from CalCERTS.

MR. BACHAND: Mike Bachand from
CalCERTS. Thank you, Commissioners and staff for allowing me to give a few comments.

As you know I am a HERS provider here in the California. And I am not speaking on behalf of all of them but I would like to -- I would like to thank Bobbi Glassel for that shameless plug she gave me. I guess I owe her lunch.

Anyway, I wanted to say that the rater community right now is really under-utilized. And not just because the construction market is ailing and hurting right now but has been even during that process a year ago when the market had a huge tail wind in it and things were going on.

The 2005 standards scared a whole bunch of people into becoming raters. And good, that helped a lot. We went from right around 100 raters in 2004 to around 750 right now and that is growing.

In fairness, the solar part of what we have done has been difficult to develop. It's complicated, it's new, it involves some processes that weren't contemplated initially. So I think that it's been very helpful that staff has tried to contain the solar HERS processes in the same continuity that Title 24 has been going under in
the last decade.

I would also like to thank Charles Segerstrom and PG&E for helping us develop the training, providing an opportunity to get that solar training at no cost to our people and to really help us get through that process.

But I would like to emphasize most of all, under-utilization. Not only in the field. In other words, raters are ready to go to work. They would love more work. They're out there, they're hunting, they're ready for it.

But also our data acquisition registry. I don't know how familiar you are as Commissioners with how our data registry works, and this is for all providers. I know staff is highly aware of it. We acquire data from every inspection that's done. And we could be acquiring lots of different forms of helpful data that we are not necessarily acquiring now.

So I would like to just bring that to the Commission's attention. That maybe this is an opportunity to help gather useful information. Everything costs money, and we've heard that a lot today so we understand that and our efforts have been always to keep costs as low as we can.
And the final thing I'd like to say is that the HERS industry, a year ago you didn't hear about the HERS industry, you heard about these HERS rater guys.

It is becoming an industry. It's important that that be promoted and cultured so that it becomes a useful, meaningful stakeholder in all of this process.

And so I'd like to say that we are interested in promoting that as an industry growth. That would benefit us personally and community-wise too. Thanks for your time.

ASSOCIATE MEMBER PFANNENSTIEL: Thank you for your comments. Jeanne Clinton from the PUC.

MS. CLINTON: Good morning. I thought I would offer a few perspectives on some comments that have been made today on how some of these requirements would relate to the Public Utilities Commission role in terms of improving budgets for utilities, both for efficiency and for CSI.

And I should just say my role at the PUC is as an advisor and some of the issues that I'm going to point to today reflect decisions that have already been taken by the Commission.
Other comments that I'll make are issues that have not yet been -- the result of a formal decision by the Commission. I'll try to make those distinctions but I may forget. The general point is that the remarks I'm saying are not all reflective of actual decisions that have been taken by the Commission so far.

I thought I'd clarify one thing. One person was commenting on the cost effectiveness issue. I think it's important in any policy decision to distinguish cost effectiveness to whom.

And the issue of what is cost effective to a homeowner or a resident or a business that is considering efficiency in solar is a different question than is it a cost-effective use of ratepayer money to pay for the efficiency programs and solar incentives that are being expensed against ratepayer funds.

And so those are just two different perspective and we just need to make sure we look at both of those as we consider options.

The second is -- I think the Energy Commission staff understands this but I'm not sure if it was fully reflected in the document. That
in 2005 the CPUC took a fundamentally different approach to approving utility expenditures on efficiency programs.

And that approach was to, what we call, portfolio, it gives the utilities targets, quantitative targets for energy savings and megawatts, gigawatt hours and therms. It gives guidelines on overall cost-effectiveness of the portfolio.

And we do not give prescriptive direction to the utilities on specifically which programs they should include in their portfolio or what the design features of those programs should be.

So there are many instances in the staff report where it says the utilities should offer these kinds of programs or should fund these kinds of things or the PUC should direct or order the utilities to do X, Y, Z.

And at least from the point of the PUC and the investor-owned utilities I just wanted to clarify that we have taken this portfolio approach. We do think that performance is ultimately the name of the game forgetting these preferred resources at the lowest cost. And we
don't take that approach of directing them to do program X which features A, B and C. So that is just a clarification.

On the comments that were in some of the slides this morning about certain elements or features being consistent with the Big, Bold, Energy-Efficiency Strategies at the PUC.

Again, just to keep us clear on where we are today. The Big, Bold Strategies are staff proposals that have been put forward in a public process. The Commission has not yet issued a proposed decision or made a decision on those issues.

So we don't know for sure if they will become a platform. We are scheduled to release a proposed decision in a few weeks, in early September and have a vote by the Commission in early October, 30 days after that. So certainly by October we'll all have a better sense as to whether that's an official position of the PUC.

Related to that, I think an important philosophy that sort of underlies the concept of big, bold is to try to engage the market stakeholders in moving towards far-reaching, energy efficiency integrated with other demand-
side solutions including solar and demand response activities.

But our approach has been to try to create a market demand or a market pull for these things. To try to get stakeholders in the market to see that it's in their economic interest to be pushing these.

And I understand that the issue before you today is to say, well should we take one slice of the market, that being those customers that are contemplating solar and have them perhaps be the guinea pigs, if you will, for requirements that might go in the exact same direction that we've been proposing as staff in terms of Big, Bold.

So I just wanted to sort of a philosophical and policy issue. Is the solar market the time and opportunity to test on a required basis some of the mechanisms that are being put forth now on a voluntary basis to try and move the market.

And one other comment on that is, as you know the PUC strongly supports energy efficiency, authorizes substantial amounts of funds for energy-efficiency programs. The investor-owned utilities who have commented today have indicated
that they are interested in many of these ideas, have many programs either on the way or maybe on the drawing boards and what I want to say about this is these are good ideas.

And they should be offered broadly to all customers in California. And I think what we ought to be doing is trying to create enough market interest and market demand to have these broadly embraced.

And then we can address separately the question of whether they ought to be mandatory at the time of the seller decision. So I want to underscore that.

And energy efficiency obviously is first in the priority order in California. And these are great ideas. And we need to be putting more attention into how to get those ideas broadly out there.

I think a related question about how we look at combining solar energy efficiency is that we know that one of the biggest obstacles right now to solar is the cost.

And I think the challenge as we move forward is how do we design our incentive programs and policies in a way that will support driving
the cost down.

And we've both embraced the concept of, both of our organizations have embraced the concept of declining incentives which is sort of the rabbit out there telling the industry you really need to get your costs down, you really need to get your costs down.

And so I think we have to look very carefully in understanding other parallel decisions we may make. And whether they are supporting or perhaps competing with the goal of not only getting our solar installed but in order to get more solar installed we have to get the costs down.

And so we have to look at the way that solar is being sold in the market now and the way energy efficiency is being delivered in the market now. I know that there's an ambitious goal here to have those broadly integrated in the way they're delivered in the marketplace.

But the market isn't there yet. So the question is, we don't have the same contractors delivering both solar and all of the energy-efficiency solutions for a home or a business.

And so I think the challenge in linking
these two in any kind of mandatory way would be, who will do the delivering and what will the elapsed timeline be for going through an analysis process, a contracting process to get all the pieces installed.

And I think we need to give some thought to what will that look like, what will the cost implications be and what will that do to our policy hopes.

I have two more points and then I'll stop. One is that obviously the Legislature has directed the Energy Commission to adopt some energy-efficiency requirements that are become conditions of solar incentives.

And I'm not sure to what extent there's been consideration given to coming up with some minimum, prescriptive list of measures that would be clearly identified and understood. So that solar contractors can form business partnerships with appropriate energy-efficiency contractors who together can sell a packaged solution. Without necessarily having to go off and get involved with home energy raters or building performance analysts or commissioning specialists who aren't necessarily the ones who would then install the
efficiency measures.

So this is again thinking back to, we're trying to get more solutions in front of customers and have customers make informed choices and perhaps some sort of a analyzed, prescriptive list which isn't perfect but would allow the market to operate in some sort of a clear and orderly manner.

It might be considered and a starting point for looking at what this could look like would be to look at the half dozen or so retrofit-on-sale ordinances in California, both in the residential and commercial sectors and see what kind of prescriptive measures are in those and what's been the experience with those.

Finally I would just observe that the California Solar Initiative Program as overseen by the PUC also includes the industrial sector and the agricultural sector.

And most of the efficiency recommendations have been targeted at buildings. We do have a substantial amount of participation from the industry and ag sector, in particular, wineries that are classified as agricultural.

So to the extent that solar systems are
being installed as trellises over parking areas on
dairy barns in other kinds of establishments that
aren't going to lend themselves to benchmarking or
energy star ratings I think, you might say, well
let's just exempt them, but I just thought I'd
point that out so that you can finish your
recommendations. Thank you.

ASSOCIATE MEMBER PFANNENSTIEL: Thanks
Jeanne. Let me say that I'm, it's really
important that the Energy Commission and the PUC
are in this together. I think not just in terms
of the dollars and the requirements but in terms
of the basic, underlying philosophies.

The two agencies together adopted this
electric loading order of energy efficiency and
then renewables. And we have common
responsibilities making that real. So I think
that our working with the PUC on the energy
efficiency part of the CSI is really important.

The other part of that of course is the
money that we have responsibility for billions of
dollars of ratepayer money over some period of
time as well as ratepayer money that goes in the
utility programs and then the public goods charge
monies that go into these programs.
And I think that we share your view that we want to make sure those dollars are used for the highest priorities first. And so we do need to find the way of integrating energy efficiency with the solar programs.

Clearly there are a lot of both philosophical and I think we're hearing today a lot of practical, administrative concerns of how to do that. But I do think we need to make sure that we are together in using our energy-efficiency money to support the solar program not to hinder it but in fact to be supportive of what we're giving to people in the state for their money.

I don't think this is different than where you're coming from. But I do think that we need to make sure that as we implement the CSI that we are connected with the PUC in that.

MRS. CLINTON: I would just offer an observation that obviously we need a connection. The question is how. And the question is to what extent are there minimum requirements. And to what extent are there other opportunities that we're both broadly encouraging in marketing.

And this may be too black or white of an
analysis but California supports energy
efficiency. California supports solar.
California supports low-emission vehicles but we
don't tell a household, you can only get the
incentive to buy the Toyota Prius if you first
insulate your home.

They're all important. And each one is
in a different place in the market spectrum. And
each place has consumers and end users adopting
them for different reasons.

And I think the challenge is how do we
move all of those forward and to what extent to we
have the linkages. I would be the first one to
admit that there's a strong potential for our
residential, existing home market product that
says we'll come in and make your house a low-
carbon house. And we'll do all this efficiency in
solar.

And I think the challenge from a policy
perspective is what's the right set of steps in
phasing to get that kind of situation happening in
the market.

ASSOCIATE MEMBER PFANNENSTIEL: I agree
that that would be an interesting product. But
I'm not sure that's the only product that we are
bringing to together here. I think that there is much more of a connection within the household or the business or the commercial establishment between energy efficiency and solar.

And it is very simply that we want to make sure that we're giving the best, most efficient use of the solar dollars with the system that is sized for the most efficient house or building that we can have.

And that was a philosophy that has been driving the Energy Commission for several years now. As we've looked at building a solar program it was to make sure that we're using our solar dollars to get the biggest bang for the buck, if you will.

And that's driving where we are in the CSI. I think that the partnership with the PUC on this is the partnership with the PUC and of the utilities and the solar industry and the building industry, the construction industry in California. And we have been working to build that to make sure, we understand that there are administrative obstacles and we're trying very hard to find ways to alleviate them. We don't want this to be a problem.
But we do want to make sure we're using our incentive dollars as efficiently as we can. A million solar homes or 3,000 megawatts or however you want to measure it, there really isn't enough money to pay for all of that if we're going to have to keep those incentives at a very high level.

But if we can move the, as you pointed out, if we can move the cost down we can get that many more solar installations for the money.

MS. CLINTON: So I think we're agreed that we need to get the cost down so that we can get more solar. And maybe if I could beg your indulgence for just one more observation. Last year before SB 1 passed the Public Utilities Commission, in the course of presenting its first, the staff proposal for the original design of the CSI Program had a proposal there for connecting energy efficiency to CSI, including not only the energy audit requirement but we, as staff, had floated the idea that in customers where there was not a willingness to undertake energy efficiency at the same time that perhaps we might cap the size allowance of the solar system.

That obviously wasn't, didn't carry
forward because of a number of reasons including becoming more evident that SB 1 was likely to pass and that the Energy Commission would be promulgating the requirements.

But I'll just share briefly with you the thinking there was. Even if energy efficiency were able to cut energy use at a home or business by 50 percent that home or business still would need some electricity.

And so the idea at that time was well what if we say that the solar system could not be sized more than 50 percent of the load reserving the option for the energy efficiency to come in at a later date and do the rest of it.

We didn't go forward on that. But I just would share that we too shared that sense of how do we spend ratepayer money correctly.

Thanks.

ASSOCIATE MEMBER PFANNENSTIEL: Thank you Jeanne. I seem to have engendered some additional blue cards. Julie Blunden, Sun Power and Solar Alliance.

MS. BLUNDEN: Thanks very much. Madame Chairman and advisors. A couple of data points about Sun Power which I actually think are
relevant to this conversation.

Sun Power is based in San Jose. We manufacture the highest efficiency solar cells and panels in the world today.

We also are at this point we have now grown to be the largest manufacture of residential systems being installed in California. And we do business with dozens of dealers across the state and therefore have pretty good data about what's happening in the markets.

We also have as a result of the acquisition of Power Light in January, the largest installed base of commercial systems in California and therefore an excellent view of what customers have done in the past.

You may know that we have worked very closely with customers on energy efficiency issues from public agencies like the SFPUC and the City of San Francisco with the Moscone Center to Macy's where we announced a couple of months ago that we'll be doing 26 stores across the state that all include major suite of measures associated with energy efficiency.

We also have a large backlog of new solar homes in the state, over 3,000 across both
the Energy Commission program and the muni
programs and therefore I think we've got an
excellent view of the general state of affairs in
terms of what's happening in which markets in the
state.

I also serve as the team lead for the
Solar Alliance in California. And we work very
closely with CalSEIA and Vote Solar. And we hope
to be able to put comments together for you by the
29th from all three groups on the staff report.

We very much appreciate the opportunity
to have this workshop. We consistently find that
the Energy Commission does an excellent job of
putting forward some material, putting together
presentations explaining the positions they came
up with. And I find these workshops personally to
always be informative in terms of the thought
process behind the positions put forward.

The team of the Solar Alliance, CalSEIA
and Vote Solar do not have a defined set of
positions that I'm going to try to speak to today.
But I wanted to put forward from Sun Power's
perspective a few things that I think may end up
seeing thematically in our broader comments.

Harking back to a couple of things that
Jeanne talked about. The operationalization of this element of integrating energy efficiency into the process of putting solar into somebody's roof or their ground-mounted system is a challenging one. And let me give you a couple of very specific examples.

In the new solar homes market we are working with multiple builders right now, some of whom are very purposefully moving forward with a very broad suite of home applications that they're looking to differentiate on.

So for example we had a couple of our builders, I think it was in May, put out data that showed that their solar homes were selling twice as fast as homes in the nearby community which is outstanding. It's wonderful to have solar actually being something that is helping the housing market in an otherwise down cycle.

And it's appropriate in a new solar or potentially new commercial building perspective to integrate all of the energy efficiency stuff right up front. It makes a ton of sense. It's a clean slate. It makes lots of sense.

Retrofit market obviously different. As staff noted trying to separate the program
requirements. One of the things that's interesting in the commercial market is that solar is not necessarily on the same track as other energy initiatives within a commercial company.

So if we're going in and talking to somebody who's very sophisticated in energy procurement like a Macy's or Wal-Mart or Lowes, Target, all of those folks have been procuring in competitive markets in California and other parts of the country for years and therefore have many things operating in parallel.

So they may have a whole plan for energy management system roll outs. A whole plan for energy efficiency improvements. A whole plan associated with solar. And they aren't necessarily, solar is not necessarily going to be the thing that instigates new efficiency measures. It may be something that they decide to tag along with. And it may be something that they had on the back burner. We come in with solar. We say, hey how about some energy efficiency too. And they buy into it.

But I think it's important to recognize that, particularly in the commercial market, that may also be true in the ag market, that solar will
not necessarily be the driver and therefore
operationally thinking about the question of
sequencing and whether doing things in parallel or
in series ends up being incredibly important.

So that we not end up getting kind of
cart before the horse in terms of a very rational
plan for energy efficiency implementation that a
company is taking that would essentially delay
solar implementation beyond, for example, the
current step which would make it no longer as
attractive to do, a multi-site deployment for
example.

On the residential side it's
fascinating. We had a colleague up here earlier
talking about he's got more demand than he can
deal with right now from some the larger dealers
in the state coming and looking for help. It's
fantastic that the, apparently the, online audits
that are being used today are creating demand for
energy efficiency services. And I think that's
excellent market data suggesting something that I
think some folks looked at as being diminimus to
the point of is it worth the effort turns out to
have been worth the effort, in fact, perhaps not
diminimus at all.
Probably the theme that Jeanne ranged
that I would like to just build upon for a minute
is the notion of assignment of responsibility in
application of energy efficiency. The solar
dealers are, and I don't want to say struggling
because that sounds negative, but I just did, what
they're doing is very, working really, really hard
to grow their businesses really, really fast.

And that's something that at Sun Power
we're helping them do with our community dealers.
We're helping scale their services et cetera.
It's a major undertaking to take what was
potentially a mom-and-pop business with a couple
of folks and ask them to become a much larger
business really quickly.

What they aren't is energy efficiency
experts. They're just not. And to the extent
that we move forward with broader, big, bold plans
for energy efficiency linked to solar which I'm
all for conceptually I think the question is how
do we do that in a way so that the folks who first
of all have the money which are the utility
programs and have the expertise which are the
utility program managers and their contractors
actually take responsibility for the sales and
implementation of those efficiency measures.

So the way I think about it is both
sides have the potential to ledge in for the
other. We have, in fact just yesterday, received
updated interim marketing and outreach plans from
the program administrators for the CSI.

And the CSI has a great opportunity to
be linked with energy efficiency at marketing
material that's already going out to customers.
what a great thing to just add solar to the list
of opportunities that are already offered to
customers in bill inserts, et cetera.

In the same way with the CSI has an
opportunity in its marketing through its dealers
to market energy efficiency services that the
utilities offer whether it's commercial or
residential.

If I were to break things down what I
would say is that there's an opportunity for CSI
to essentially lead gen for the energy efficiency
programs that are coming in, a place and well-
funded, well-considered, as far as I can tell,
quite strong motivation from the utilities to
fully implement.

And our job is to figure out how to take
maximum advantage of a the marketing on both sides of the equation, the energy-efficiency marketing to cross market solar and the solar marketing to cross market with energy efficiency.

I worry about ending up in a situation where we either sequence that to the point where we lose customers who would like to do both but aren't, for whatever set of really legitimate reasons, aren't willing to wait until they finish their window installation to put their solar system in.

So the kind of bottom line is that we do very actively expect to see major cost declines in the solar industry over the next five years. At Sun Power we very publicly state that we will reduce the installed cost of a system by 50 percent by the end of 2012.

We see needing to do that across the value chain. Realizing that looking at today's California prices about half the cost of a system is downstream. That is, after you sell the panel all the delivery to the customer costs about half of the system.

That means we got to get that system cost down by 50 percent just like we need to get
the module price down by 50 percent.

Asking the solar installers to become
energy efficiency wizards is not going to help us
reduce the costs. Helping the solar installers
quickly transfer customers over to the people who
are energy efficiency wizards would be in my mind
the most logical method of trying to meet the
goals of SB 1, the goals of the loading order but
also kind of legitimately address pragmatically
who is best served to do what. Any questions?

ASSOCIATE MEMBER PFANNENSTIEL: None,

thank you Julie. Steve Chadima, Energy
Innovations.

MR. CHADIMA: Thank you Madame Chairman.

I am here representing my own company, Energy
Innovations. We are also part of the Solar
Alliance. But at this point my reason for
stepping forward is actually to talk to you about
something that I did 25 years ago. I'm dating
myself.

But in Portland, Oregon that speaks
directly to the question of energy efficiency and
how you handle the question that everyone in one
way or another seemed to describe as unanswered
and sort of the devil that is the detail. And
that is the question of cost effectiveness.

We had a program. We had an ordinance, energy efficiency ordinance in Portland that was widely regarded by the citizens, the ratepayers in Portland as very progressive and very acceptable and very understandable.

The program was a three phase program. But we required an energy audit. We required that homeowners and businesses implement all the energy efficiency improvements that had a five year payback or less. And, and this is very critical, we provided the incentives for them to do it.

We provided a low-interest loan program that from day one, I think Bobbi was describing something similar but, from day one the amount of money that you would pay to fund the improvements was less than the amount of energy savings that would result from doing those improvements.

So you were cash flow positive from the very first day that you implemented those energy efficiency improvements. It was simple. It was straight forward. It was understandable by everyone. And no one resented the requirements. The minute you start to dictate specific efficiency improvements, R30 in the ceiling,
double-pane windows, whatever it might happen to be, those may or may not be very cost effective for the individual homeowner.

You've got a lot of homes in Portland that were flat roofed. Requiring insulation would, ceiling insulation would require building a super structure on top of the home in order to get the insulation in there.

The same thing goes though also by the well meaning but unfortunately I think it turns out to be self-defeating notion of requiring improvements that would put a specific building into the top quartile of buildings in their class.

The problem with using that kind of measure is that it's a bit like chasing your tail. It's not our call to evacuate to the park or anything (very loud noise from workmen on the roof) No? Okay. So I think it's probably best illustrated by the kind of obviously silly notion, if you ask a random sample of parents whether their children are above average or average or below, 80 percent of parents will tell you that their kids are above average.

Well, obviously 80 percent of children cannot be above average. The same thing goes with
buildings. If you start to stack everybody into the top quartile that top quartile keeps escaping you. And you're never going to get a situation where you're going to be able to shut everybody into the top 25 percent.

So you don't really need those kinds of criteria. All you need to do is just use cost effectiveness as an approach. And remember Jeanne mentioned this and other people have raised this question as well. Cost effective to whom.

But in this particular case it was to the homeowner because it's the one thing that made the most sense to them. And so I encourage you to use that as really your criteria regardless of who is responsible for implementing.

Julie had a suggestion that maybe the utilities are best equipped to deal with the energy efficiency improvements. Whoever it is, make it sensible. Make it really common sense for everyone to simply agree without a lot of objections.

ASSOCIATE MEMBER PFANNENSTIEL: Thank you for your thoughts. Adam Browning, The Vote Solar Initiative.

MR. BROWNING: Thank you Commissioner.
My comments will be brief here. I just wanted to start by saying that SB 1 is primarily a solar program. And that as you implement the non-solar aspects to it you keep in mind the effects that it may have on the solar industry.

I think clearly the energy efficiency requirements will add additional costs to the implementation of the program both on the administrative side as well as on the installers side.

But it has the potential anyway. (Very loud noise coming from roof) Someone doesn't agree with my comments here, apparently. (laughter) Should I just keep going. My comments are brief. I'll be done here. It has the potential of setting up a situation where you have deal-killing requirements.

And the replacing of the building envelope for example may be (continued very loud noise from roof) - (laughter)

ASSOCIATE MEMBER PFANNENSTIEL: Why don't we hold just a second and see if we can get somebody to.

REPORTER: Commissioner this may not get on the record because of this.
ASSOCIATE MEMBER PFANNENSTIEL: Well I know but we're having trouble hearing it in the room. Oh, I'm sorry, you mean what has just been said won't be on the record because of the noise.

REPORTER: It may or may not be depending on the final tape.

ASSOCIATE MEMBER PFANNENSTIEL: Okay, it sounds like we've stopped it for now. I'm terribly sorry. Can you go back over your last thoughts.

MR. BROWNING: Certainly, no worries at all. I was simply saying that SB 1 in primarily a solar bill and that as you implement the non-solar specific considerations that were contained in the legislation be mindful of the impacts that it will have on the solar market or could have on the solar market.

So first and foremost it will definitely add additional cost, both on the administration side as well as on the implementer's side, the solar installers. But more importantly there is the potential for, on the proposed energy efficiency requirements to have a deal-killing requirements.

And other speakers have discussed the
definition of energy, of what is cost effective as being key to this. I just mean to say that replacing a building envelope may be cost effective to someone's definition. But that could definitely end up being an absolute deal killer to the solar market.

So as you go forward I just encourage you to focus on the realities of developing a market transformation in the solar market and to keep that in mind and keep the program flexible.

Thank you.

ASSOCIATE MEMBER PFANNENSTIEL: Thank you very much. That's the pile of blue cards I have on the energy efficiency area that we have covered. Because I do have to leave at one I'm going to beg everybody's indulgence and ask you to hold off on the need for a lunch break right now. I'm sorry.

MS. CHONG: We have one call on the phone.

ASSOCIATE MEMBER PFANNENSTIEL: That's fine. Just a second and I'll take that call. But I think our schedule going forward will be -- I'll ask Smita to, after taking this call to keep on going because I would like this to be as much of a
commissioner workshop, a committee workshop as we
can get in.

We'll break just before one o'clock as
far as we've gotten at that point. And then I'd
suggest that you have a lunch break and reconvene
as a staff workshop. And I do think that there's
further comment that we would benefit from
hearing.

So that's my thoughts going forward.
And we have a caller on the line?

MS. CHONG: We have a Michael Keyes.

ASSOCIATE MEMBER PFANNENSTIEL: Go ahead
please.

MR. KEYES: Hello, can you hear me?

ASSOCIATE MEMBER PFANNENSTIEL: Yes,
perfectly.

MR. KEYES: Actually most of my comments
sort of reinforce somebody's previous comments. I
think the greatest concern is that this type of
requirements will inhibit sales. And probably 80
percent of the installation, solar installations,
physical installations are residences.

And that it is tricky to figure out the
exact cost-effective measures that, the cost-
effective measures that can be implemented in any
given residence. Each residence is different.

And each geographical area is different.

Earlier Andrew McAllister mentioned San Diego is
different. I'm from Sebastopol. And Sebastopol
for those of you who don't know it has the
highest, installed PV, number of PV systems per
capita of anywhere in the state.

And our clients up here are all very
aware of energy efficiency measures. That is not
that much of an issue. They don't all actually go
ahead and install new windows or ceiling
insulation. But it's not that they haven't
already put in lights and replaced the
refrigerator.

So the second point is and for us we
don't use air conditioning here, or very seldom.
It's not needed. And most energy efficiency
measures save natural gas not electricity. Which
is not a bad thing and I'm not saying that you
shouldn't incorporate energy efficiency measures
in some manner and require them in some manner.

But it's the kind of question of is this
the appropriate venue for doing it. So as thirdly
as the type of audit. Currently it's an online
audit that's normally done by customers
themselves. And it's rather than being an audit per se that it's really more of an education for the customer.

That to do a valid audit you would really want to have either a HERS rater, a building performance contractor come in and do that. Sometimes you can't tell the condition of your ducts until you do a duct test.

But those kinds of audits you're getting into costs of $500 to $1,000. And it's going to inhibit people if they have to do that first it's going to inhibit them from even exploring solar further.

And then Jeanne Clinton mentioned earlier that perhaps a prescriptive approach would work better. And that'll be something that would at least be easier for installers to understand. And clearer measures that affect electrical use are things like lighting and your refrigerator and then your clothes dryer and the rest of those electrical items, electrical-use items are almost more personal habit, like do you turn your lights off and when do you use your clothes dryer and those types of things.

So those are the comments that I wanted
to add. Thank you.

ASSOCIATE MEMBER PFANNENSTIEL: Thank you very much for sharing those comments. Now I think we'll move to the next, oops I'm sorry.

MS. CHONG: We have actually one more phone call. It's from Tom Conlin.

ASSOCIATE MEMBER PFANNENSTIEL: Go ahead please. Mr. Conlin.

MR. CONLIN: Yeah, thank you. I apologize for not being able to be up there in Sacramento in person today. And I just wanted to make briefly some quick comments about the report.

It's not really my area of expertise but it occurs to me that the solar component in installation standards in the report. They actually appear to be fairly well developed. And I want to commend the staff for that.

However the energy efficiency recommendations, particularly related to existing homes, appear to me to be much less well developed. And I'm concerned that the current report may not really meet the mandate of SB 1. In that area of requiring reasonable and cost-effective energy efficiency. And consideration of that as a condition of providing incentives for
eligible solar energy systems.

And I did hear, and I want to acknowledge the concern of the solar industry representatives who obviously at this period of growth don't want to be burdened with unreasonable requirements in a prescriptive standards or things that would really get in the way of people who want solar from being able to get it installed.

So I'm really trying to think through how the report the conditional language that's in the report turns like concepts rather than eligibility criteria might be tightened up and made a little bit more specific without really limiting the ability for the industry to continue to grow and meet customers' demands.

What I'm imagining is some kind of more like a disclosure oriented approach. Essentially the, placing a fairly light burden on the solar contractors at this stage to simply document what kind of energy efficiency analysis and disclosure they have done as part of their applications for solar incentives.

I'm thinking along the lines of a maybe a one page form that would require them to simply disclose what kind of energy efficiency analysis
was provided. For example, was it a self-administered web audit, was provided, which particular one was used, whether a HERS rater was used.

And simply requiring that that information be captured at the time that the solar application is filed. Going beyond that to require perhaps counting up the solar, I'm sorry the existing consumption data, maybe 12 months of billing data for the house, or I'm thinking primarily about the existing residential sector here aspect.

That gives generally in my experience part of the solar quotation. And probably wouldn't be an additional on the developer and may already be part of the process for applying for the incentive.

And then, if possible, identifying which energy efficiency improvements were determined to be cost-effective through that process. Again this is just reiterating whatever came out of the analytical process that was chosen.

So it doesn't strike me that that would be terribly burdensome. And it would provide the condition and the policy makers as well as the
utilities to get a lot of information on how are
different projects how is energy efficiency being
integrated into these different projects.

And it would also be a way of ensuring
that if energy efficiency analysis information was
coming into the dialogue with the customer at the
time that the decision is being made.

And as far as trying at this stage to
impose prescriptive mandates that strikes me as
being counter-productive as many of the solar
industry people have indicated that that would
simply be trying to, as it were, have a, require a
person to insulate their walls before buying a
Toyota Prius.

So I'm, just in summary I would
encourage a more of an information disclosure
basis approach as opposed to a very close-ended
specific set of guidelines. And thank you for
consideration of my comments.

ASSOCIATE MEMBER PFANNENSTIEL: Thank
you for your comments. Move on to Smita.

MS. GUPTA: Can you turn the lights
please. Good afternoon everybody. I'm Smita
Gupta from the Building and Appliances Office.
And in the presentation I'll be covering the staff
recommendations related to component and installation standards.

The first slide here is a quick overview here of what the SB 1 direct the Commission to set up. Bill has already covered that. But just as a recap the design and installation and electrical output standards and the rating standards for equipment and component. So, next slide please.

And in the component standards, of the three main components related to the PV system that we'll be covering are the modules, the inverters and the performance meters.

So the first will be the PV modules itself. The Commission has been moving away from a capacity-based notion of describing systems and therefore the eligibility criteria for PV modules needs to be not based on the nameplate power rating of the modules.

Because that does not provide adequate indication of the performance that those modules will have when a part of a system. And this would be related to both SDC or the PTC rating standards since those are conditions, very specific conditions of solar radiation and temperature that are imposed to create, to figure out the
properties of the module.

And also that a different cell manufacturing technologies and of engineering developments are not primarily focussed or captured by the nameplate rating alone. It's a bigger area of properties that describe the performance of a module. You know distinguishing of one kilowatt, amorphous silicone form crystalline silicone. So that's just as an example.

The other issue is to deal with the international of being aware of the international test standards and provide performance data that is in accordance or modules that are tested in accordance with international test standards.

Currently in the US the UL requirement or the UL test 1703 for modules related to safety is the only standard that is imposed on the modules. But in Europe and worldwide there are international tests, the IEC tests that address more of the performance characteristics.

And so the staff recommends to use those. And also that the tests be performed by accredited independent laboratories to provide credibility to the results that are being used.
Just to go over some of the module performance characteristics that are recommended here for being used rather than just the nameplate capacity rating. That modules have an entire curve of performance related to their current and voltage. And it's seen right here.

So the nameplate rating would just give you this point on the curve. But for this given point there could be multiple shapes to this curve which is what distinguishes one technology type, one manufacturing type from the other. And so therefore utilizing these other data points is very important because they impact the overall performance. This is just one specific condition.

The other thing is the normal operating cell temperature which is a property since PV modules tend to perform differently at different temperature conditions. And therefore there is a big difference in a rack-mounted versus building-integrated products since they are in more close contact with the substrate that they are installed on and therefore tend to run at higher temperatures compared to the given ambient temperature.

And therefore the NOCT becomes an
important property of the module that would
determine its performance. The other are the
temperature coefficients which are seen in the
graph here as indicative. The drop or the change
in performance or the power output of a typical
module with increasing temperatures. So on the X
axis here you have increasing cell temperatures
and see the rapid decline in the power.

So that is another set of very important
indicators of the performance of modules when
actually installed in the field.

So based on this brief background the
staff recommends that the PV modules, all eligible
PV modules have the UL 1703 safety requirement
which is no change from what the current status
is. Because the earlier eligibility, CEC
eligibility criteria included that basic
requirement which is being used both by the CSI
and the NSHP program at this point.

The bigger step has been the inclusion
of the performance data related to the module
which the NSHP program has implemented. And there
over 100 modules that have been listed under the
program that have completed these test
requirements and provided performance data as
tested in accordance with IEC 61215 and 61646
which are two test standards related to
crystalline silicone and thin-film technologies
respectively.

And these test results be carried out by
an ILAC accredited laboratory which gives
credibility to the equipment and the test
performing capabilities of the lab in reporting
these requirements.

And the third bullet here if for the
NOCT as mentioned in just previously the NOCT or
the operating cell temperature is an important
property. And for a building integrated products
the Energy Commission under the New Solar Homes
Partnership has developed a specifications or
tests that describe how the NOCT for building
integrated products should be tested. Because the
status in the industry has been the NOCT is
provided typically in an open-rack condition which
is not the case for BIPV.

So as installed a BIPV panels built into
a relatively higher temperature and that needs to
be accounted for.

In making these recommendations it is
recognized that there are other national and
international efforts that are also developing requirements. For example the Department of Energy's Solar America Initiative and also in the European Union there are efforts and so all the test requirements here that's why will be aligned with the international requirements.

For one we know that the UL 1703 requirement is slated for update in accordance with international standards in the near future.

So just the staff recognizes those efforts and changes and will align with them.

For inverters, there is no change compared to what the current eligibility criteria is. The Energy Commission since 2005 has adopted testing protocol which in place to list eligible inverters that provides detailed test data, performance data for the inverters apart from their UL Listed safety status.

And this is an eligibility criteria as in used both at the Energy Commission and by the CSI program. And so no change in that criteria is suggested. Next slide please.

The only main, slight caveat to that is since the whole performance data for the inverters is available through these testing requirements
the Commission will recommend to make use of the entire range of the performance data rather than just the single, rated efficiency number that abstracts the entire performance there will be capability to address the performance of the inverters at various operational conditions.

This is just an example curve here where the efficiency tends to drop in the lower power operation ranges. This will promote better match up of modules and inverters and address under-sizing and over-sizing issues more specifically.

The performance metering requirements at this time are very well defined under the CSI program. And so the staff recommendation is to align totally with those. And as we understand the CSI Metering Subcommittee is still developing additional protocols and requirements for the five percent accuracy meters and is acquiring ANSI tests for the two percent accuracy meters.

And so the staff recommends that in these guidelines we totally align with those requirements in place.

Moving on to installation standards. In this we'll cover some, these broad topic areas which are related to calculation methodology,
shading, peak load, addressing peak load, field
verification and installers.

ASSOCIATE MEMBER PFANNENSTIEL: Excuse
me Smita. I think this is going to be a fairly
separate and significant part of your discussion.
I'm wondering if this would be a good time to
break. I think that rather than, I do need to
leave by one. And rather than having me leave in
the middle of what you're doing.

MS. GUPTA: Okay.

ASSOCIATE MEMBER PFANNENSTIEL: Maybe we
can break now. You can come back and finish this.
And then we can get comments on this. All of
which will be on the record. So I will capture
the comments as well as any written comments, of
course, that come in.

So why don't I suggest a break until two
o'clock. And then, Bill, would you conduct the
staff workshop thereafter?

MR. PENNINGTON: Sure.

ASSOCIATE MEMBER PFANNENSTIEL: All
right, so we will be adjourned until two o'clock.
(Whereupon, the lunch recess
was taken.)

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AFTERNOON SESSION

MR. PENNINGTON: Okay, we're going to start. Smita, you want to continue.

MS. GUPTA: Good afternoon everybody again. We'll continue the presentation dealing with the installation standards.

MR. PENNINGTON: Did people -- What happened with the blue cards, anyway? Do we know?

MS. ORLANDO: I'd like to say one thing about the blue cards, on the speakers. When you come up to the podium be sure that there is a blue card filled out or you hand the court reporter your card so he can accurately capture your name, your correct name and spelling.

MR. PENNINGTON: So is anyone else going to want to comment this afternoon?

SPEAKER FROM THE AUDIENCE: Are you going to use the existing pile or do you want us to put a separate card in for afternoon comments?

MR. PENNINGTON: I prefer a separate card.

MS. GUPTA: So the recommendations related to installation standards, the main goal is to have high performing systems that address peak. The main mechanisms to address performance
are, one of them being the performance-based incentives, which is where the bill encourages most systems should be. And for that the staff recommendation is to use the CSI deployment schedule for requiring the performance-based incentive approach, which is incentives which are paid over time based on the ongoing performance of a system.

The thresholds set for that are 50, are systems that are 50 kilowatts or higher starting in 2008 and it would become 30 kilowatts or higher in 2010.

For the remainder of the systems, which will need calculation of the expected performance base, it becomes really important to have a calculation methodology and other mechanisms in place that will ensure the ongoing performance of the system even though the incentives are being paid up front.

So the calculation methodology that accounts for all the performance factors is really important. The issue of shading avoidance mainly, and if unavoidable, accounting for it. Addressing peak load. And having a field verification protocol and methodology in place as well as
addressing the installer responsibilities. These should all go together to ensuring high performing systems that would be paid up-front incentive.

Here is a list of the factors that are key to affecting the performance of the system. I’ll quickly go down the list here. The location, of course, is the main one because that determines the weather data, which is the solar resource, the ambient temperature and wind, which are the conditions under which the PV system would operate.

Then the installation characteristics, which would be the orientation, which is characterized by the azimuth, that is north, south, east, west, and the tilt at which the installation is installed.

Then mounting type, which is the offset of the modules above the surface that they are closest to. In case of the IPV, which are in direct contact versus rack-mounted systems which have a frame and have a free flow of air underneath them. Because as mentioned in the previous section, the operating temperature, the immediate conditions around the PV panels is really key to the performance as well.
The mounting height of the system above
the ground in terms of if it's on one-story, two-
story or higher because that affects, again, the
conditions, the localized conditions around the
system in terms of wind and impact of wind at the
operating temperature.

Along with that would be the number of
modules and the way they are strung together in
terms of the electrical circuit, series and
parallel. Because different designers would
create systems to operate on high voltage or be in
parallel circuit to accommodate for various
mounting conditions available. So those also play
a key part in determining the performance because
the voltage and the power output at specific times
is affected by those.

And the installation related to shading.
Because the location after installation exposes it
to certain obstructions and shadings sometimes
during the day and year and that is, again, a very
important factor that needs to be accounted for.

Then carrying over to the specific
characteristics of the equipment that is selected
for each of the systems. We have discussed some
of the details of the equipment earlier in the
earlier section, the PV modules, the detailed current and voltage performance, the normal operating cell temperature, the temperature coefficients, because these determine the performance given a set of conditions for a specific hour.

And the inverter performance data, which when matched up with the output of the range at a certain point makes it operate at different points in its efficiency curve.

And then there are some overall system level factors which are to some extent given as a -- there is bound to be some dirt and dust buildup and some mismatched wiring, which as an overall impact the performance of a system.

Also the equipment mismatch, which is partly a function of how the inverters and the modules are matched up, both in terms of the circuitry as well as the equipment and their varying performance characteristics.

So based on all of these characteristics that performance staff is recommending a calculation of performance calculation methodology that at minimum accounts for all these factors that affect performance.
In order to incentivize high performing systems, again going back to the notion of not having just a single name plate number, a name plate capacity number to incentivize the system but rather the calculation approach to account for all these factors.

These factors also include, part of them, the different cell technologies that are available in terms of addressing the performance characteristics of the PV modules specifically and also addressing different installation types. Could be fixed systems, one and two axis tracking systems, et cetera.

Also that the calculations be performed on an hourly basis. Because that is really important to be able to address the pack load factor because the peak load is very hour-specific in the year. So it is important for the calculations to be determining performance at specific times in the year and to be weighting the performance during peak loads differently from other times to incentivize systems or reward systems that optimize their installation characteristics and equipment characteristics to address that time.
And the hourly calculations also allow for addressing shading on an hourly basis. Along with that goes the notion of being able to generate a field verification table. As we'll discuss a little bit later in more detail that verification of performance is, again, considered an important aspect of ensuring high performing systems and the expected performance realm. And then for the ability of the calculator to generate tables which can be used easily in the field to verify spot performance based on measured ambient conditions such as solar radiation and temperature.

So under the New Solar Homes Partnership the Commission has developed such approach and the ability of the calculator to generate such a table. This is seen as one of the major things to be used in the expected calculation approach.

I am going to go through a table here which compares at a very broad level the two major approaches that are used widely in California at this time. We do recognize that there are other programs that have different calculation methodologies but for the focus, the majority at this time are either CSI or NSHP.
We're just going to go through a one-on-one comparison of these two approaches, which are called the EPBB and the EPBI, respectively, the Expected Performance Based Buydown versus the Expected Performance Based Incentive. Just a difference in terminology there.

So the column on the left, which is the blue, is the CSI-EPBB approach and the one in green on the right is the NSHP-EPBI approach.

So the first one here is dealing with the module characteristics. This table is divided -- Perhaps some of you are familiar with the concept of the two approaches but just let me give a quick review on that. The EPBB approach, which is the CSI, uses the PTC watts rating of the modules combined with inverter efficiency and accounts for installation and geographic differences through a design factor, which is calculated using the PV watts engine. So this first part of the table here is just dealing with the non-design factor portion of the calculation.

The EPBI-NSHP approach has been to try and move away from the capacity notion altogether and use the reference system as a means to establish dollars per kWH, which is TDV rated.
conversion, and then applied to the hourly, annual output from the system. So the comparison sometimes is not, there may be some repeated fields here just because of the difference in addressing this calculation.

So the first one here is the module characteristics and this is addressed in the EPBB using the nameplate PTC rating after the module, the proposed module. As we have been mentioning in the earlier part of the presentation as well, the detailed performance characteristics of the module that are used in the NSHP-EPBI approach.

The module type in terms of either the BIPV or a rack, which the NOCT value is the main, different characteristic addressed in the recent CPUC decision by adjusting the PTC for the EPBB. In the EPBI there is a methodology to account for that temperature if it is not reported in the interim. But since the eligibility criteria requires that all BIPV modules be tested in their as-installed condition, the NOCT that is used does reflect what is actually -- affects the performance of the BIPV.

When the inverter is handled on a single weighted efficiency number versus using the entire
performance curve for the range of operation
conditions in the EPBI approach.

Generating the field verification table
is one of the things that the NSHP program and the
EPBI calculation emphasize, which is carried out
by the CEC-PV calculator and that is not a part of
the EPBB calculations. Next please.

Now we will go to the factors that are
accounted for in the design factor portion and
compare those to the NSHP approach. But again,
just reminding that in the NSHP there is an hourly
calculation for every proposed system.

So the design factor. One of the key
things in the EPBB approach is that is always
capped at one. Whatever the reference system, the
performance and installation and the location of
the reference system is the maximum that is
rewarded. Whereas the EPBI-NSHP approach does not
cap any performance but rewards systems that
perform better than the reference. The selection
of the reference, if it's a BIPV system based in
San Jose, that's used only one time in order to
determine the effective dollars per kWH.
Thereafter any proposed system depending on their
annual production gets rewarded accordingly.
Other differences in the base
calculation engine that is used. The EPBI-CSI
calculator uses the NREL developed PVWatts2
calculator in the background to calculate the
performance of the system. As a contrast the
EPBI-NSHP has selected the five parameter model,
which has been enhanced with the inverter model
and customized for California. This came out of
the University of Wisconsin Solar Energy Lab,
Dr. William Beckman and his group. They are the
ones that have implemented this approach into a
California customized version for NSHP.

Then again I'm coming back into the
module characteristics because of the design
factor portion of the calculation. The module
characteristics are, in the EPBB calculations, are
the ones that are defaulted by the PVWatts engine
because in its base assumption the PVWatts engine
carries out the calculations for the values that
are typical of the characteristics of the module
and therefore in effect the NOCT or the
temperature coefficients or the performance curves
are identical for any system.

The NSHP calculations in contrast
recognize the difference in the different module
manufacturing technologies and engineered designs
and uses the entire range of performance
characteristics, which distinguish a different
module than manufacturers in the calculation.

In the inverter it's again the same,
weighted efficiency versus the entire performance
curve range. And also handling the match-up of
the inverter to the modules differently. The EPBB
approach uses a capacity-based reasoning to allow
for capping -- disallowing any under-sizing off
the inverter more than 25 percent.

Whereas in the NSHP approach the
inverter and the module, the array matched up is
totally based on the performance curve of the
inverter and the production capability of the
modules, limited by whichever is the, you know.
Whichever reaches the limit. If the modules reach
the production limit or of the inverter reaches
its handling capability.

And again this is on an hourly basis.
These performance, detailed performance
characteristics are recognized at conditions
operating at each hour.

The mounting height, we've talked about
that as the height above ground. So since the
NSHP calculator utilizes detailed weather data on an hourly basis and recognizes the impact of wind at various heights so that is scaled according to the mounting height.

Then there is handling of the peak load portion, which is addressed in the EPBB calculations through recognizing production in the summer months, which are defined May through October. Versus in the EPBI-NSHP approach where since the data is hourly there is recognition of the exact hour and the year the production happens.

And it is weighted using the TDV values, which is the time dependant valuation weighting methodology that is in use and been developed for the energy efficiency standards, which rewards energy savings at a particular hour in the year according to the impact that they have in terms of the generation and cost of generation and transmission for the grid for that zone. That's one of the key differences. Next please.

The handling of location and weather data is again different in terms of since the EPBB calculator uses PVWatts and the weather and location selection is determined by the PVWatts of
selecting the closest selection weather data,
depending on the proposed location.

The NSHP-EPBI calculation uses the 16
climate zones weather data, which is used for the
Title 24 energy efficiency standards that
everybody is aware of in the building industry.
And again the data is, weather data is hourly and
uses solar radiation, temperature and wind data
for each hour.

There is a difference in selection of
the reference location. EPBB uses Orange,
California as a reference location and compares
systems in their geographic correction portion of
the design factor to compare against production in
Orange, California. And the EPBI uses San Jose,
installation in San Jose as a reference. But
again, only to calculate one time for a given
incentive level the dollars per kWH TDV and does
not limit any systems thereafter.

The orientation which is determined by
azimuth and tilt are slightly different again in
both approaches. It may be due to rules that are
decisions based on the proposed and the reference.
In the EPBB systems that are oriented between
south and west are compared to the same azimuth.
Whereas in the EPBI approach the reference system is always fixed south. So potentially any -- again, since that is what sets the incentive rate per kWh TDV, so any systems that are oriented to better or to optimize production greater than that or less than that are rewarded accordingly.

And systems that in the EPBB, systems that are relatively east, east or south are compared to south. Whereas systems that are relatively north of west and east are compared to a west facing system. It's so that the production in west is relatively lower compared to south because of the low sun angles. So the systems that are relatively north are compared to a lower production value typically.

Tilt is also a part of the calculations here. Addressed through, being compared to an optimal tilt for a given location. And in the EPBI approach the reference system is at, considered at a tilt of 5:12 roof pitch. Because for the New Solar Homes Partnership this addresses production housing. A 5:12 roof pitch is considered a typical roof pitch for the installations.

However, through various analyses that
our staff has carried out for the most typical
ranges of azimuth, two ranges that are common to
roof pitches do not have a very significant impact
on the production. It's always within 10 percent
at the most.

Then shading is another of the key
things the staff has recognized that needs to be
addressed in the expected performance calculation
in order to have installers and verifiers aware of
the impact, potential impact of shading, which
could be disproportionately higher than the actual
shading amount in the case of PV systems.

And it can get a really complicated
methodology in order to estimate the exact impact,
therefore the production impact of shading. So to
try and come to a mid-level approach there has
been the use of this 2:1 minimal shading criteria,
which is in use both in the CSI and the NSHP
program that allows for obstructions that are
sited at least twice the distance from the array.
That they project above the array to be exempted
from being accounted for in the shading.

But any other obstructions do need to be
accounted for. And the methodology in the CSI-
EPBB approach right now is under discussion and
review in the CSI shading subcommittee
discussions, which I understand would have a
recommendation soon. But the current status is of
reporting a percentage of solar availability for
the summer months, which are the ones that are
used in accounting for the design factor.

In the NSHP-EPBI approach it has been to
use a more simplified methodology in which
obstructions are described in terms of the
distance and the height, the distance from the
array and the height that they project above the
array. And it is the calculator which analyzes
internally the hour and the year that the
obstruction will end up obstructing the solar
altitude at that given location. So the
measurements are more simplified.

And also that it accounts for things
like trees. Only the distance of the sitting of
the tree from the array is more critical because
the methodology asks for the species of the tree
and categorizes trees, all trees in California
based on the USDA classification of trees as
small, medium or large and defaults mature tree
height to them. So that takes away from any
complicated measurements or effort in estimating
those things in order to promote more compliance rather than avoidance of such analyses.

so that part is addressing the future shade. So trees are one of the main things. And also any other potential structures that may be surrounding the array. In having this methodology in place it makes both the installer/designer aware of these impending obstructions that might affect the performance of the system in the future.

This is going to lead into the discussion on shading and therefore we have given all these facts about shading. The staff recommendation has been to address shading in enough detail and as described or based on the NSHP methodology, which is recognized to be more oriented towards new homes. But on that basis it can be easily extended to existing residential and the commercial sector as well. But to have the NSHP methodology as a basis.

And again to say that to review the findings and recommendations of the CSI shading subcommittee and definitely pick up any of the merits from there.

One thing I'd like to say is the shading
methodology bases itself in trying to minimize the
use of any complicated instrumentation, again
which is perceived to be as some of the reasons to
avoid or have non-compliance of doing enough
shading analysis. So having a very --

There is an option of using the detailed
shading analysis, two, that are available and
widely used at times by the solar industry. But
to use them to a level of determining the
elevation of the obstructions and then calculates
the effect in the calculation approach rather than
using the numbers that come from the tools
themselves and relying on those. Next please.

In terms of addressing the peak load the
staff recommends that there be hourly weighting of
the production in order to encourage systems that
perform higher on peak. And for that it is
suggested that the TDV weighting factors for every
hour of the year be used to value the production.

And field verification is also a very
important factor that helps ensure the performance
of the system in terms of ensuring that all the
intent of the system that was calculated does in
fact get installed in the field accurately.

So third party field verification is
seen as an important aspect to that and should include verification of the equipment, the PV modules, inverters, meters. The installation characteristics, which is in terms of it's a PV module, what azimuth tilt it's mounted at.

Also the performance verification, which is another thing. To avoid any systems that are not installed or have some missing, you know, modules that are not connected. To otherwise catch any systems that are, that could not have the expected performance that was anticipated and incentivized.

And the field verification table that was mentioned earlier is the main mechanism to ensure that in which the verifiable make a spot measurement of incident solar radiation and ambient temperature and look up the inverter display for the corresponding production from the system and verified against a look-up table for that specific system. That is generated for the specific system to verify that it indeed is performing.

And there are tolerances that are built in this protocol for each of these measurements to account for any instrumentation discrepancies and
measurement discrepancies between the installer and the verifier.

And to use a sampling approach when verifying the system so that it does not place a burden on having to verify 100 percent of the systems. In the New Solar Homes Partnership, in the production housing case the approach of one in seven sampling is used, which is similar to what is used for field verification purposes under the Title 24 standards for verifying energy efficiency measures. I know you talked about the tolerance.

And the last but not least thing is on having installers also aware of all the field verification protocol and use that to certify all the systems that they install in order to ensure that they are up to the performance level that the field verifier is going to check for. So the protocol says not only for the field verification purposes but also for the installer as a guide to know what aspects of the system that they need to check for.

And the requirements for the installer are totally consistent with what CSI and NSHP have in terms of the qualification of the installers, with the addition of requiring installers to
certify that the installation qualifies on all the component installation and performance and shading aspects. They have to verify all of that.

And that's all we have for the installation.

MR. PENNINGTON: So I have a couple of blue cards here. If there are other people that would like to comment could I have your blue card.

So these are it, is that correct? I was hoping your blue cards would say what you're going to speak on. Some of them do. Okay. Could we start with Steve Chadima. Is that correct?

MR. CHADIMA: My name is Steve Chadima. I'm with Energy Innovations. Our company installs large commercial systems in California and also is developing a rooftop tracking concentrator for use in the same program. So I have two comments completely unrelated.

One of them has to do with the standards, and particularly the IEC standards. In addition to the two standards that you've noted for silicon and for thin film there is a third IEC standard for concentrators, which is under development. It is being circulated around the world now for comment and it should be, it should
be adopted by the IEC sometime this fall.

So I would only suggest that you think about that as well. We support the IEC standards as a mechanism for more realistically assessing the peak capacity of the systems. So I would just suggest that you keep a note of that.

The other is a question. I really have to admire the level of detail that you guys have gone to in looking at the potential impact of not just, for example, average inverter efficiency but inverter efficiency over a range. The same with operating temperatures, orientation of the systems and all.

The question I have for you though is, have you taken a look to see how much more accurate you would be using this what on the surface seems to be a much more complex evaluation system than the simpler system that is in place right now?

I have this tendency to think that most of us who have academic backgrounds, I'm a mathematician by training, we love models and we love the perfection of tweaking these models so that they're exactly correct. But in the end it may turn out that all of this complexity gives you
very little additional benefit for the ratepayers, for the customers involved.

So I would just encourage you to really take a look at trying to find some balance between perfection and practicality and simplicity and ease of installation. Because, you know, there is the old saying about perfection being the enemy of the good. Thank you. And I think that may be at work here as much as I admire the level of work that you have gone to.

MR. PENNINGTON: Do you want to respond, Smita?

MS. GUPTA: Appreciate your comment there. Just one. The response is that though the whole methodology sounds complicated but to the user, the end user as such, the amount of input and the effort is going to be no different. Because at the end of the day you're just selecting a module, you're just selecting your inverter.

And all the calculation burden really is being handled at the back end by the computation and the computation power these days is not a limiting factor. Therefore if we have the ability to use all these performance values that are
available and tested and provided we see the merit in being able to use them at no detriment to the end user and adding any complexity to their life.

MR. CHADIMA: As long as you've got that in mind that's the most important thing.

MR. PENNINGTON: One other comment I would have is that the, particularly the cell temperature and the performance of the modules relative to temperature is kind of the next horizon for manufacturers to address. And in fact they are addressing it and the performance of these systems will be dependant on the improvement at that level. So by having a system that takes that into account you align your incentives to be consistent with the goals of improving the modules.

MR. CHADIMA: No argument. I don't think you could find a person in the room who would argue with the objectives of the program. By the way on that note, one thing that it was good to see in your comparison between the two current EPBB type calculations is why there's a cap of one on the EPBB calculation is beyond me. I mean, you ding people for under-performing systems but the PUC doesn't reward people for high
performing systems.

And I'm glad to see that the program that you've at least pursued at the New Solar Homes Partnership doesn't have a cap one way or the other and it simply is what it is. You have a performance system that has certain performance characteristics and you're rewarded accordingly. That's a good thing as they say, so I thank you.

MR. PENNINGTON: Okay, thank you, Steve.

Is it Joeline Monestier?

MS. MONESTIER: I just have a few questions I wanted clarification on. And the first one is kind of touching on what Steve had brought up about the NSHP calculator allowing for no caps on the incentive. However, maybe this is just a clarification. To my knowledge the CPUC has required that the incentive not go over a certain step amount for that. So in recommending that the New Solar Homes Partnership calculator be used how would you basically address the fact that it cannot go over the incentive to reward higher performing systems?

MR. PENNINGTON: I don't know how to answer that question. That's a policy decision that the CPUC has made relative to that, that we
have not made. From our vantage point it makes sense to incent the highest performance systems and find a way to do that.

MS. MONESTIER: Okay. I just wanted some clarification to see if that was possible to look into.

Another question I had was, it was addressed that the New Solar Homes Partnership has the HERS raters to come out and do the inspections and it was also addressed that the installers would have a certification of installation.

The first question is, when there are HERS raters that were coming out, it was addressed earlier, that they cost anywhere from $300 to $1,000 potentially to go out and do an inspection. Is the installer required to pay for that, is the customer required or the program administrator required to pay for it?

MR. PENNINGTON: That --

MR. PERKINS: That's a good question.

MR. PENNINGTON: If you want to come forward, sir. Come forward, sir.

MR. PERKINS: Dan Perkins.

MR. PENNINGTON: One clarification before you respond, if I could.
MR. PERKINS: Pardon?

MR. PENNINGTON: One clarification before you respond. You were talking previously about doing a home energy rating for an existing house, looking at the energy efficiency measures that would be cost effective for that house.

MR. PERKINS: Yes, that's correct.

MR. PENNINGTON: And using a HERS rater as a field verifier is a different task completely than that and you wouldn't expect the field verification costs to be as high as what you said. So disagree with me.

MR. PERKINS: It could be as high as that. First of all I'm Dan Perkins, Energy Smart Homes, San Diego.

But it could be as high as that if it were a very large home and if the homeowner wanted more in-depth on their rating it could go as high as $1,000. Generally speaking it's $300 to $350 on the average home.

But the fiduciary responsibility is between the rater and the homeowner or the person that is going to buy that home. They have an arm's length from anyone else that's involved in this. So there is no responsibility that anyone...
outside of that rater has other than to the homeowner. Okay.

MR. PENNINGTON: So the other comment I would have is that we also have a sampling approach. So the $350 or whatever was estimated would be for the house that is sampled. So the house, you know. And the total cost works out very well for subdivisions in particular where that cost gets spread so it turns out to be, you know, one-seventh of that cost on average.

MR. PERKINS: Yes, and I'll speak to that in a little bit.

MS. MONESTIER: I was going to say, so in theory then a customer doesn't know when they're a purchasing a system whether or not they're going to have to pay potentially $350 at the end to get their inspection because they don't know if they're going to be the one in seven.

MR. PENNINGTON: I don't know. There's other HERS raters in the audience that might respond to that question.

MS. MONESTIER: Okay. And then my last one was, you said the installer certifications for installation, that each installer has to be certified. Are you saying one person per
installer? So if there's say 100 installers in a company that only one person would have to be certified. Or would it be every installer?

MS. GUPTA: The certification is of the system, not the installer. So the installer has to certify the system is in accordance with what was proposed for the incentive.

MS. MONESTIER: But didn't you say that we had to be certified to be able to do an inspection to make sure it's in line with the HERS raters?

MS. GUPTA: No, the system has to be certified by the installer. The requirement for the installer is to have the contract, the appropriate contract licensing requirement. But the certification is for the system by the installer.

MS. MONESTIER: Okay, so there is no separate approval of installers.

MS. GUPTA: No, the NABCEP certification is encouraged but not required.

MS. MONESTIER: Okay, thank you.

MR. PENNINGTON: Joelene, could you identify yourself. I'm sorry, I didn't ask you.

MS. MONESTIER: Joelene Monestier with
SPG Solar.

MR. PENNINGTON: Thank you. Julie Blunden.

MS. BLUNDEN: Julie Blunden from Sun Power.

One of the things that was very helpful in this section was to have the table that described the differences between the two calculators, very clearly delineating what the PUC version does and what the Energy Commission does. I think it would be incredibly helpful for those of us needing to put in comments next week to have something similar for the rest of these two sections.

Because there's a whole bunch of issues here where there has been a discussion in the material about what your preference is but it is not entirely clear whether that is different than how it's currently operating in one or both programs. So for example I noticed it looks as though somebody had come in with a similar comment because of the words on some of the slides saying, like the New Solar Homes Program or like the PUC program or like both or a combination thereof.

It would be incredibly helpful so very
specifically and concretely. If you look at the field verification item, for example. In your VI, page six, you --

MR. PENNINGTON: Chris, could you pull that up.

MS. BLUNDEN: -- you designate field verification. This is the bullet in the executive summary:

"Staff recommends that a sample of systems be required to have third party field verification for visually checking components, installation characteristics and shading, verifying performance using NSHP protocol."

We have a measurement and evaluation program that will be in place through the PUC program that will have a sampling technique and requirements thereof.

What I am not sure is whether you're saying there needs to be something above and beyond that or whether you're saying, use the M&E protocol that the PUC comes up with but have that
protocol incorporate requirements that are part of the New Solar Homes Program.

Whether you're saying, take the field verification approach we're using in this New Solar Homes Program and use the same one in the PUC program. Or whether you're saying, do something completely new that we're not doing in either program currently.

So in order to have kind of a concrete response to this and several of the other points that you've made in both the installation and component standards recommendations it would be very, very helpful to have that level of detail in terms of, here's what we're doing in one program, here is what we're doing in the other. We're recommending either one, the other or a third thing.

Because this is such a dense piece of work, in order for us to be legitimately thorough in responding to things I am 100 percent confident that we will miss a recommendation that we thought was intended to be just a confirmation of something we're doing currently but isn't. And then we'll miss our opportunity to have a contribution to the conversation. So that's kind
of point number one.

MR. PENNINGTON: So reacting to that. Smita, did you want to react to that? One thing is what's recommended here are the elements that are covered by the NSHP field verification. And we see that these are, from our view these are the necessary things to be observing in the field or measuring in the field.

MS. BLUNDEN: And have you compared them?

MR. PENNINGTON: I think it's correct that we don't know of a counterpart protocol.

MS. BLUNDEN: Okay, let me just ask our program administrators. I believe we do have inspection protocols set up for the Energy Commission -- for the PUC program. Yes? And have we compared those two protocols?

MR. PENNINGTON: If that was made available to us we could probably do what you're suggesting.

MS. BLUNDEN: Okay. So I have a concern that if we don't have the ability to create the same kind of table we have for the EPBB, EPBI, the quality of the conversation is going to be moderate to low as opposed to very good to
excellent.

So I think it's imperative actually that we do a very clear side-by-side on each of these major points so that we're clear on whether or not we've actually got a difference of opinion between the two programs. Is it some third new thing? Because for those of us operating in both programs we know what we like and what we don't about both programs and we're not clear on what exactly is being recommended for the entire program across both agencies plus the munis.

MR. PENNINGTON: Okay. To give you something that would help for comments immediately we would need to do something very quickly. Our attempt was to make these slides clear.

MS. BLUNDEN: Right, but this is a great example where we actually don't know.

MR. PENNINGTON: I'm not sure there are other examples.

MS. BLUNDEN: Well.

MR. PENNINGTON: We could talk off-line if you have some further comments on that.

MS. BLUNDEN: Yeah. For example, on the performance based incentives, I'll just go through them one by one. If you look at the performance
based incentives we talk about continuing the
payment based on a discontinuation of incentives
based on capacity. To my knowledge the PUC
program no longer does that. We have the EPBB
there. So is there, is there a recommendation
that we move away from the EPBB program to
something else?

MR. PENNINGTON: We are recommending
that a calculation that takes into account all of
that stuff in the calculator is what we're
recommending.

MS. BLUNDE: Okay. So I think that you
could argue that the EPBB calculator as set up
today is clearly a performance, expected
performance based calculation with a level of
detail less than what is in the Energy Commission.

MR. PENNINGTON: Okay.

MS. BLUNDE: So the subject matter here
appears to suggest that there's a movement away
from something that I don't think actually is
being moved away from, I think we're already
there.

And each one of these I have a similar
kind of question, you know. What's the problem
statement and is the solution one program's
approach, the other program's approach or a third approach?

So on the calculator I think what you're saying is you want the EPBI to be used universally across all programs including munis. Is that an accurate statement?

MR. PENNINGTON: Yes.

MS. BLUNDEI: Okay.

MR. PENNINGTON: Tim.

ADVISOR TUTT: This is Tim Tutt from the Energy Commission. And I think it's true that we're talking about moving away from capacity-based approaches. Many municipal utilities and POUs have continued to have capacity-based approaches and that's really what that is referring to here. We recognize that there is a performance estimation of a component in the EPBB calculation.

MS. BLUNDEI: Okay.

ADVISOR TUTT: And just one other thing, Julie, I'd say. That in these slides and in the report it says, based on NSHP protocols or based on something else. I think it's pretty clear if you go through there that we're in many cases talking about -- the proposal is either the NSHP
way of doing things or some other way that's in there.

    When we use words like based on we're looking for a comment, I think, to say the final, you know, the final document requirement in the SB guidelines will reflect public input. It may not be exactly what is initially proposed here by staff.

    MS. BLUNDE: Okay.

    MR. PENNINGTON: I agree with your comment that the side-by-side table makes it easier to review. The staff report tries to go through all the issue areas that we see and describe in detail what the issues are.

    MS. BLUNDE: Right.

    MR. PENNINGTON: So that's kind of our best shot at describing those issues. I doubt if we can do significantly better than that before, in time for you to get your comments together.

    MS. BLUNDE: Yes, we're worried about that. We're pretty confident that the density of the material without some sort of a basic overview that says, here are all the issues that are actually up for decision, a recommended decision that is different than the way that one of the
programs is operating now, means that we're going
to miss, we're going to miss commenting on
something that turns out to be an actual decision.

So for example, at the PUC we actually
have in the back of a decision, findings of fact,
conclusions of law and then ordering paragraphs.
So it is pretty clear what decisions are actually
being made. And here we don't have that level of
specificity. Which I am not recommending going to
the PUC approach putting the last few pages onto
the decision but some sort of a summary would be
incredibly helpful.

Just turning to the second of three
points I have. EPBB versus EPBI. Just, Smita, to
go back to the question Steve kind of touched on.
I expect that somebody somewhere has sat down and
done a pretty thorough analysis of how the two
compare to each other in terms of the spread
between outputs for the incentive levels in
similar, you know, the same system, the same
climate zone, et cetera. Do you have data around
what that spread ranges from and to?

MS. GUPTA: That is a pretty extensive
piece of research that needs to be structured very
well in order to isolate different factors that
impact the calculation in each of the things.

As you realize, you know, going through
them, that both the calculation methodologies deal
with each aspect in such a different way it's
really hard to isolate the factors. Just one
thing is, you know, like the TDV and the weather
data itself can drive so many of the differences.

MS. BLUNDE: Right. What I'm trying to
get a feel for is not the causality, just the
results. So are the results that we have a
difference as much as 50 percent in incentive
levels for the same system in the same location
between the two calculators? Or is the maximum
delta more like, you know, five percent?

MS. GUPTA: Bill?

MR. PENNINGTON: We don't have that.

MS. BLUNDE: Okay. That would be
incredibly useful to do before coming up with a
conclusion about the value of going to the
additional detail. Because if it turns out that
the delta, the maximum deltas anybody can find are
five percent that would, obviously, suggest that
going to a big overhaul might be more trouble than
it's worth.

I know that we have found internally
that when, and have communicated with the Energy Commission about concerns having dealt with both calculators that the EPBI calculator comes up with some non-intuitive results regarding different climate zones and are trying to address that off-line. But because of that experience and the lack of resolution on those questions we have some concerns about the EPBI as it currently exists.

And obviously it hasn't been used to the same extent that EPBB has, just because of the volume of residential applications that have gone in through the PUC program. So that's been more fully vetted just from an empirical perspective. Which doesn't mean you couldn't get comfortable with the other one, it's just that, you know, data is still outstanding on comfort level.

The last point is, on the third party verification it sounds to me as though this, you know, logically it's stemming from the notion of a home development, percent of home development kind of approach. Given the auditing protocols of the PUC's program are you, are you looking to recommend -- I heard you say one in seven, Bill. Are you looking to recommend a certain level of penetration of audits?
Because I think that's, you know. We've had that discussion over at the PUC and we've had -- that's obviously part of the M&E program that's paid for outside of, either a customer cost or an installer cost. So it's essentially an admin cost. I wanted to make sure I understood fully what the expectation here is.

MR. PENNINGTON: Yeah. In the NSHP program we don't have the option of paying for that out of administrative costs.

MS. BLUNDEE: Right.

MR. PENNINGTON: And so we have tried to internalize that verification in the market cost. And relied on the market to provide that service and have built up infrastructure to try to do that.

MS. BLUNDEE: Right. Obviously we don't need to export that issue to the rest of the market because we do have the ability to have the IOUs and other PAs -- they are specifically awarded an admin budget and an M&E component to the programs that are funded. There is no reason to think that the publicly owned utilities, you know, couldn't or wouldn't do the same thing? As we would approach energy efficiency, right?
MR. PENNINGTON: Perhaps. I think the POU's are quite concerned about program administrative costs and might be -- I don't know, I haven't heard comment about this directly but might be interested in a market-based costing of that.

MS. BLUNDEK: I think there might be value to consider, particularly with the smaller POU's, consider a contribution to a general fund that has a, you know, a common M&E service to the POU's. Thanks very much.

MR. PENNINGTON: Let's see. Raghu Belur.

MR. BELUR: Good afternoon. My name is Raghu Belur and I'm from Enphase Energy. Thank you for the opportunity to speak.

This is an excellent document. As one would expect the guidelines have been developed based on existing technologies and existing architecture. What I would like to encourage the Commission is to be open-minded and develop recommendations that would actually further encourage and allow development of newer technologies due into the market.

As a very simple example, current...
deployment architecture really suffers from issues such as shading and mismatch of panels, et cetera and there are newer technologies that are coming into the market that address specifically these things.

So please develop guidelines that have the flexibility to allow and encourage innovation. PBI is definitely a step in the right direction. That is the direction you want to go. However, with a number of systems still being, still being incentivized through EPBB you need to make sure that newer technologies that solve some of the endemic problems in existing solar systems are rewarded so that newer technologies now can be allowed to come in and flourish in the marketplace. Thank you very much.

MR. PENNINGTON: Do you have specific technologies in mind?

MR. BELUR: Yes. There are newer technologies, inverter technologies as an example, that are more robust in dealing with issues such as shading, as an example. Systems, existing systems, if there's 30 percent shading, suffer from some quantified number of loss and output. Whereas there are new inverter
technologies that address specifically that. Who don't suffer as much. Are more robust in dealing with these weaknesses. They are more robust in dealing with, you know, localized dust and debris and PPT efficiency. All of these things are being developed, are being innovated on in the Valley, in the Silicon Valley and everywhere.

All I request is that these guidelines encourage that, and have the flexibility to encourage that, and have the flexibility to take into account as newer and newer technologies become available. Thank you.

MS. GUPTA: Just, you know, that's been an intent, you know, having the entire performance range of the components be used. So if you feel that the Energy Commission is always open to recommendations, that if there are newer technologies that address properties or performance characteristics not addressed in any of the ones that are currently listed and do end up impacting to be definitely brought to our attention.

MR. BELUR: Absolutely. Thank you very much.

MR. SUPP: Hi, my name is John Supp and I want to thank you all for letting me comment today. I am the CSI program manager for the California Center for Sustainable Energy in SDG&E territory.

In the first six months of this program we had been receiving feedback from the public about specifically the shading methodology, the impacts of shade, the process changes that went into effect because of the way we need to incorporate shade.

Prior to January 1 of this year installation companies could know the cost of a system and the incentive prior to having to do a substantial shade impact study because the previous incentive models for the last nine years didn't incorporate shade into the incentive component. So it's a substantial shift.

And during that time we found some interesting, interesting impacts as a result of that. Costs that had been increasing on the contractor side because of an increased need to send additional people onto roofs, which then requires additional workers compensation insurance, to additional tooling costs because
you're having to do more shade impacts.

We found some other interesting issues as well. And one of them is we put together based on this feedback, based on our inspection feedback, based on results of a public forum we had, to put together a shade subcommittee to evaluate exactly what's been going on and how do we fix it. And after evaluating all kinds of different options we will be submitting our official, our official recommendations.

We came down to a couple of very specific, specific issues. And one of the issues that came up on a recurring basis was this concept of minimal shading. Because there is a practical understanding of minimal shading, meaning, you have a system that is not being impacted very much at all by shade. But then you have the technical definition which is, there are no objects closer than two times their height relative -- two times their height relative to the array or the 2:1.

Well mathematically a 2:1 ratio if you actually had it could produce a very relatively low availability yet still constitute minimal shading. That minimal shading definition would allow you to get a higher incentive.
What's happened is we've gone out and inspected systems and found that they actually do not fit the minimal shading definition but have measured availabilities of 98, 99 percent and thus we have to discount their incentive. So that's led to some very unhappy customers, unhappy installers, and actually very awkward inspectors -- a position for inspectors as well who again are the people who are using these tools, using and making these measurements.

So we found a few things. One is that definition may -- the majority of the committee appears to be in favor of actually changing that definition and making it more of a, determine what the availability is. And then tell what would constitute an unshaded or minimally system. And if you are above that threshold then just count that as an unshaded system. Or an unshaded month or an unshaded -- And again, we'll provide the actual details later.

So instead of saying that any system right now mathematically, which could be as little as an 82 percent availability depending on where you're located, today would be a minimal shade system. But systems that are above 82 percent may
not be minimally shaded.

So it results in, again, a lot of wasted, I would say wasted program dollars in rectifying very high performing systems that just don't meet this technical definition of minimal shading. That's the biggest, that's the biggest finding we have.

The other thing that we found as a result of that is a discontinuity in the incentive level that occurs when you have that, such a hard line distinction between it's either minimal shaded or it's not.

And what we found is, if you have such a jump we may be ending up with perversely incenting people to mischaracterize or otherwise push the boundaries of reasonableness when claiming how much impact there is, shade impact there is.

If there is a 15 percent jump in incentives if I'm at 84 percent and I meet the minimal shading I would get 100 percent incentive. But if I'm at 83 I would have to claim 83 and that's a 17 percent drop. Well that's a very awkward position for a program to try to put the inspectors and the contractors alike when the difference between an 83 and an 84 on an estimated
shade impact is really minimal.

So those are the two major areas that we were trying to rectify. How do we, how do we adopt a definition of minimal shading that always means, the system is shaded minimally regardless of, you know. Regardless of where the array is facing and what not.

And two is to eliminate potential discontinuity in the incentive such that we wouldn't be putting contractors, inspectors or the program administrators themselves into these, you know, awkward one percent solutions.

About two-thirds of the way through the shade subcommittee we received the CEC proposal, which we have been looking at as well. We opted to continue looking at the CSI program and how to make recommendations to fix the shade protocol within our existing program without making wholesale changes to our calculator, design factor, maximum and all the things that we have been talking about here today.

So again, please look forward to our recommendations. Are there any questions?

MS. GUPTA: Can I respond just briefly?

You know, the concern about the 2:1 in the NSHP
the calculation approach. Since we use the 2:1 ratio for the minimal shading and have done an impact study that -- in detriment from the 2:1 shading, you know, if there was like a continuous obstruction all around, which is supposedly an implausible condition. You know, if you have like a two-foot high fence one-foot away from the entire array for some reason. Not plausible.

That's the time when you would actually see the full, you know, the 84 and 85 percent detriment that you're talking about. So the 2:1 is in order to provide the marketplace with a convenience of not having to go through the detail of conducting the shading study and having a rule of thumb to avoid any shading. Because the sun angles that are obstructed by 2:1 are fairly low, below the 26 degree horizon. And the production of those -- and again, the production is blocked at those specific hours only that the sun is low.

MR. SUPP: Correct.

MS. GUPTA: So that is the whole intent. And since the -- In the NSHP since the shading is calculated in an hourly approach you don't run into that situation as much where you have this like 84 percent and 83 percent thing because it's
only for that specific hour in the day.

MR. SUPP: Sure.

MS. GUPTA: And for a given azimuth that
the obstruction is providing shade.

MR. SUPP: Absolutely. I don't -- The
intent of our recommendations were not to debate
time dependant valuation or not time dependant
valuation. We simply don't have it. So it's a
bit of a moot point currently because our tool
doesn't address it that way.

In reality though, when you have a home
that's already there and you have trees that are
already there and you're on the ground,
identifying 26.6 degrees is not, is actually very
similar to taking a shade measurement tool and
running a shade measurement evaluation. Because
to actually find 26.6 degrees throughout a 270
degree or 305 degree arc really does require some
sort of tooling of some kind.

So in practice it hasn't, it hasn't
necessarily saved time because making those
assessments, again without using some type of
surveying equipment or tooling, means that they're
either going to make a guess that it is minimal
shading and check minimal shading, or they're
going to take the actual measurements, one or the other.

And we found very few people are really interested in going on a roof with, you now, a surveying tool, just to find whether they need to do a shade impact. When for the same time they could just take a shade impact. That's been a sort of practical experience.

And again, the same question about the theoretical minimal shade versus the actual minimal shade. And again we run into the same problem, which is, we can have genuinely minimally shaded systems, 98 percent, 99 percent available systems, that don't meet the definition of minimal shading.

But the definition of minimal shading is going to allow for a substantially under-performing system to get a higher incentive. And we don't feel that that's, that that's directly supportable under trying to incentivize high performance systems.

So in any event the general discussion is to adopt some level of availability that's consistent in all azimuths that would constitute minimal shading. And that's based on a measured
quantity as opposed to an actual measured
percentage of availability. As opposed to a, you
know, a 2:1 or a 26.6 degree angle.

So in any event that's -- Any other
questions?

MR. PENNINGTON: Thank you. Thank you
very much. Mike Bachand.

MR. BACHAND: Mike Bachand from
CalCERTS. I just wanted to get on public record
the strongest language I can say in public
recommending continuity in this process between
the EPBB and the EPBI in terms of field
verification.

Because experience told us during the
time that the 2005 standards began to be
implemented that there were a lot of interpretive
issues still left open, which caused some
differences in training of raters and some
differences in interpretation at billing
departments and jurisdictions.

The results of all of that have been at
times difficult and inconsistent implementation at
the field level. So I am just trying to recommend
and state in the public record that the more
continuity we get out of these two processes,
wherever this all lands. I don't want to be between these two commissions.

I just want to say that it will be better implemented based on historical evidence of confusion causing bad implementation or lack of good implementation at times. I just want to make clear that the more continuity we have, my experience tells me, the better implementation we'll have in the field. Thank you for your time.

MR. PENNINGTON: I have a couple of cards here that perhaps should have been called at some earlier time. They don't necessarily relate directly to this discussion per se. But why don't we take them anyway. Dan Perkins.

MR. PERKINS: Thank you. Thank you again. Dan Perkins, Energy Smart Homes, San Diego. I'm going to throw you a little curve ball here. Does the thermal solar count as a solar roof under the million solar roof program?

MR. PENNINGTON: I am not particularly an expert on the absolute nuances of this.

MR. PERKINS: Okay.

MR. PENNINGTON: But it's a solar electric system as defined by the statute, which is a production-oriented system, right? Anyone
else want to respond to this question?

MR. PERKINS: Okay, I'll leave the question to you to answer at some point in the future. And if it does, as you know, we have a pilot program going on in San Diego for a thermal solar application. It may be determined that there is an incentive program based on that thermal pilot program and so we would like to address that.

MR. PENNINGTON: Let me read you the definition here.

MR. PERKINS: All right.

MR. PENNINGTON: A solar energy system means a solar energy device that has the primary purpose of providing for the collection and distribution of solar energy for the generation of electricity.

MR. PERKINS: And under that definition then a parabolic dish that would run a --

MR. PENNINGTON: There are other constraints.

MR. PERKINS: There are other constraints, okay. It is something that we need to look at in the future, if solar thermal is an application, particularly with new technologies
that are coming on in evacuated tube. That could
generate electricity as well. We'd like to have
those considered at some time in the future.

Then my second issue is that we know
that a HERS energy rating is going to be, is
something that we really need in order to
substantiate what the criteria should be for an
incentive program.

There are some guidelines that we think
that need to be included in that as well. That
anything that is newer than ten years or within
this first, last ten year window, that they be
included as a Title 24 and under the ENERGY STAR
program of being Title 24 plus 15 percent.
Anything beyond that ten years would require a
HERS rating.

And that's our platform for this. That
if it's over ten years old in all cases at the
time of sale that the HERS rating be incorporated
as the guideline for what that criteria would be.
Not that the customer have any specific thing that
they have to do to accomplish. In other words, no
specific measure, no mandated measures, but only
those that be supported or the application be
supported with a HERS rating.
The customer then or the home buyer can then make the decision as to whether they want to do energy efficiency in lieu of solar or -- In some cases that's the only choice they may have. It may not be practical to do a solar system on a particular house. Then the only application that they have would be to do energy efficiency. Okay?

MR. PENNINGTON: Okay, thank you. And Peter Brehm.

MR. BREHM: Thank you for the opportunity to comment, specifically on the solar energy system component.

MR. PENNINGTON: Could you identify --

MR. BREHM: I'm sorry, Peter Brehm with Infinia, vice president of business development, government relations for Infinia Corporation.

Thank you for the opportunity to comment specifically on the solar energy system component standards in the staff report. As I just mentioned my name is Peter Brehm, I'm Infinia's vice president of business development and government relations. I speak on behalf of Infinia Corporation, a Washington State company headquartered -- We're headquartered in Washington State and have developed a solar electric product.
Infinia's three kilowatt solar electric product has been in prototype development and testing for over two years and will enter commercial production in 2008. It fully meets the definition of a solar energy system in SB 1. When introduced in 2008 Infinia's solar electric product will convert solar energy into electricity at significantly higher efficiency rates than any PV product on the market today. It offers the opportunity to significantly reduce the cost of solar electricity in California.

Unfortunately, under the proposed eligibility criteria for solar energy systems in the staff report Infinia's solar electric product will not qualify for any incentives because it is not a PV product.

Adoption of the Energy Commission's proposed eligibility criteria will limit consumer choice to only those products that use PV. This is clearly not good public policy because it artificially limits the number of potential solutions and solution providers available to the market. And probably most importantly, is not in compliance with SB 1.

In SB 1 California's lawmakers describe
the objective requirements and desired outcomes for a dramatic, world-leading, solar electric program. SB 1 explicitly defines the term, solar energy systems, as meaning solar electric systems. A much broader definition than the PV-only approach put forward by the Commission staff.

In SB 1 lawmakers acknowledge that the CPUC had adopted the California Solar Initiative program which was expressly understood to be, and was treated in SB 1, as a solar electric program encompassing both solar thermal electric and PV photovoltaic systems. The preponderance of evidence throughout SB 1 clearly indicates and requires customer-size solar electric programs.

SB 1 requires the Energy Commission to establish eligibility criteria for solar energy systems and it provided the explicit definition of the term, describing a class of solar technology that it intended the Commission to establish criteria for. And that definition includes Infinia's product.

By definition in SB 1 a historical precedent in CPUC's CSI program, and by straightforward application of market logic, the term, solar energy systems, are solar electric
systems and include products based on solar thermal electric as well as PV technologies.

The Commission staff by attempting to redefine solar technologies, excuse me, by attempting to redefine solar energy systems to be solar energy in parentheses photovoltaic PV systems, restricts the technologies that receive incentives when SB 1 made no such restriction.

The SB requirement on the Energy Commission does not refer to such a term. The approach taken by the Commission staff in its staff report defining PV eligibility criteria rather than the broader, solar electric eligibility criteria, does not meet the expressed requirements of SB 1.

Now it has been suggested that the solar thermal and solar water heating programs created by SB 1 be used to, quote, accommodate non-PV solar electric systems such as ours. This approach fails to recognize that our solar electric product generates electricity directly from concentrated sunlight and may or may not make use of any available thermal energy for other uses.

An attempt to accommodate non-PV solar
electric systems in this solar thermal and solar
water heating program, and consequently to not
provide the appropriate eligibility criteria for
solar electric systems such as Infinia's product,
not in compliance with SB 1.

SB 1 explicitly states that the
Legislature understood that the CPUC had adopted a
CSI program that included photovoltaic and solar
thermal electric applications. Then the
Legislature added a program for solar thermal and
solar water heating, which the CPUC correctly
interpreted to mean solar heating that displaces
electricity usage.

This solar heating program is for
products that capture solar thermal energy and use
it in a way that reduces electricity consumption.

As I mentioned earlier, while Infinia's
product can provide solar thermal energy for this
purpose the predominant use of this product is to
generate electricity directly from concentrated
sunlight, and so much more efficiently than PV
products can.

Infinia respectfully requests the
Commission's revise its eligibility criteria by
aligning it with SB 1's broader definition of
solar electric systems encompassing both solar
thermal electric and PV systems. This will ensure
California's access to the best available products
and technologies, converting sunlight into
electricity.

Thank you for the opportunity to comment
on this matter of great importance to Infinia and
thank you for the opportunity to introduce you to
a US manufacturer of near-term available solar
electric technology that can contribute to meeting
California's solar electric objectives. Thank
you.

MR. PENNINGTON: Thank you, appreciate
that. Those are all the blue cards I have for
this portion of the afternoon. Is there anyone
else that wanted to be heard at this point?

Benjamin Collinwood.

MR. COLLINWOOD: Should I just jump
right up?

MS. CHONG: I have one.

MR. PENNINGTON: I'm sorry, you have one
on the phone too, okay.

MR. COLLINWOOD: My name is Benjamin
Collinwood, I am a representative of Sanyo Energy
USA Corporation. We're a manufacturer of solar
photovoltaic panels. And I just had a couple of comments on module certifications that have been introduced in this program.

Mainly I wanted to say that frankly we are okay with the new certifications. For example, IEC performance testings that have been required in the New Solar Homes Partnership Program in order to get your panels listed and approved and that kind of thing. And also the tighter tolerances that have been requested as of late.

However I did want to ask though and mention that there are many new solar technology start-ups introducing new panels and technology and the testing centers are often maxxed out currently. It is difficult to get products tested in a reasonable amount of time.

The market is growing very fast. For example there are many, many thin film companies coming on line. A case in point is that Sanyo recently introduced a new module and it took us 16 months to get it through the process. This was excessively long.

And in order to facilitate faster adoption or introduction of new solar technologies
I would like to ask that you consider the restriction that only ILAC certified testing centers are the approved ones to use.

For example, we had -- To do the IEC performance characteristics of the modules we had to submit the test results of that. Well we had the panels tested at Sandia National Labs, a government sponsored lab. And yet it was not ILAC approved and therefore we couldn't submit that data, even though we had everything we needed to do. And we had to go back to another organization and have our modules, excuse me, retested and submit that data again.

So I would just like to ask you to please consider the fact that the market is booming. There are many new companies. There are only a handful of certification centers where modules can be tested and they are often maxxed out and it takes quite a bit of time to do that. So please consider opening it up to other certification centers that are not only ILAC approved. Thank you very much.

MR. PENNINGTON: Thank you. And Diana, there is a person on the phone?

MS. CHONG: Right. It's Michael Keyes.
MR. PENNINGTON: Okay.

MR. KEYES: Hi, can you hear me?

MR. PENNINGTON: Yes.

MR. KEYES: I just want to comment. I am assuming that the NSHP calculator will be used in a CSI program at some point in the future, if for no other reason than that it accommodates the adjustment for time of use or time of production and the current methodology doesn't.

But it also has other advantages. The hourly estimated productions based on current conditions. That as far as verification goes is probably the only tool you need. Because if you go and it's producing as expected you can just assume everything else is correct. Or if it is not correct it doesn't really matter. If they are claiming 10 modules and they have 12 modules, who cares?

I do have some -- I have actually a long list of questions about the calculator but two primary ones. One is, has it been calibrated against actual systems in production across the state? Do we know how accurate it actually is?

And then the second one. The EPBB calculator is strictly intended for calculating
rebates. It has no other purpose. That's clearly stated on the calculation worksheet. Is the NSHP calculator designed to do or intended to do design as well?

Those are sort of my two questions.

Well actually I sort of have a third question. I was also on the CSI shading subcommittee with John and he sort of covered most of what the committee included but he didn't really talk about the CSI shading methodology versus the NSHP methodology.

And the NSHP methodology is fairly simple but at the same time it is also -- this is a very high resolution. That it can be extremely inaccurate very easily. And the CSI uses multiple measurement locations. Currently the four corners of the array, it averages them. Which if you have a shading object that just covers part of an array or a single part of a string may not have very much impact but would be recorded as 100 percent loss of production.

So are you looking at enhancing the shading, how shading is done with the NSHP tool? And those are sort of my questions. Thank you for taking the time.

MS. GUPTA: Okay, Michael. Your first
question regarding the calibration of the NSHP model. The NSHP calculations are based on the five parameter model which has been developed, as I mentioned earlier, by the University of Wisconsin Solar Energy Lab. And the five parameter model is a published model and has been validated in the peer, has had by peer review and been validated against tested data from various sources. So the basis of the whole NSHP calculation is already a pre-validated calculation algorithm model.

We do have ongoing efforts to get high resolution monitored data from various sites that can provide good validation to the tool on an ongoing basis to cover for any newer technologies and systems that need to be addressed by the calculation.

Your second question regarding the strictly for rebate purposes. The NSHP calculation methodology as such is definitely usable for predicting performance but not necessarily intended as a design tool. Maybe because it has a whole layer of rules and restrictions directed towards creating the incentive amount. So the model as such has the
capability for use, but with the rules set on it, it is strictly for incentive calculation purposes. And your third comment about the shading methodology. The methodology that has been developed for the New Solar Homes Partnership is at times primarily aimed towards new construction and was cognizant of the fact that the shading estimate at application time needs to be made on systems that don't exist on the ground. Hence the methodology was kept really simple.

So we feel that approach is good for, suitable for new construction and definitely keep the opportunity open to the recommendations from the CSI shading committee to extend the basis of this protocol to address any aspects of the market in terms of the existing retrofit or large commercial systems that would be more suitably addressed through that methodology.

Does that answer all your questions?

MR. KEYES: Yes, thank you.

MR. PENNINGTON: Okay, thank you. One other card, Dick Lowry.

MR. LOWRY: Hi, I'm Dick Lowry with Sharp Electronics. We're the largest manufacturer of solar modules worldwide. I just have a very
brief comment. I'm our manager of government relations and I only point that out because nowhere in my title will you find the word engineer.

I just have a few notes that I'm passing on from our engineers touching on some of the testing protocols, et cetera. Some of what I'm going to say is slightly different than what Mr. Collinwood mentioned a moment ago. We work together through the Solar Alliance. We will come to a consensus position. But just for right now I wanted to give a little bit of a different viewpoint for balance.

To begin with, because the IEC testing is not required throughout the rest of the country we are wondering if there are certain pieces of that testing, certain data points that you are looking for and if we could actually just perform those particular tests rather than have to go through the entire IEC process.

MR. PENNINGTON: Do you want to respond to that, Smita?

MS. GUPTA: Yes. That is the specification for subsections that relate to the performance data that is required are the ones
that are required, not necessarily the entire IEC certification.

MR. LOWRY: Okay great.

MS. GUPTA: So that is desirable.

MR. LOWRY: Great, thank you.

In agreement with Mr. Collinwood, I am under the impression that there are only two independent labs that can run the testing that you're asking for and we do feel that that will take an extremely long time for the entire industry to go through those labs.

But further we would like to potentially recommend that similar to the current UL testing that self-testing be allowed if there are
guidelines set for that testing by you. If we are, you know, available for audit, you know, on whatever kind of basis, you know, needs to be set. That we be allowed to self-test, if that might be a possibility.

And then the last note I have is we'd like to see this testing become sort of module, sort of platform-wide rather than each individual, specific module. Obviously parameters would have to be set. but there are a not of very small modifications made to modules which will not
significantly impact their performance. We think that to have to do all of the testing for each individual little change is a bit onerous.

And that is all I have for now, we'll submit more in writing.

MR. PENNINGTON: Thank you.

MR. LOWRY: Thank you.

MR. PENNINGTON: Okay, I think we'll move to the next section of the agenda. Sandy.

MR. MILLER: Thank you Bill. I'm Sandy Miller, I'm with the renewable energy program. I'm going to be up here because I didn't bring my glasses today. I want to be able to read what I am talking about here.

This reminds me of a couple of weeks ago I was at the PV managers meeting and I was the last speaker before lunch and lunch was a half hour late. So I don't know what's better. Being at that meeting where you're just before lunch or whether you're at this meeting where people are starting to look at their watches and trying to think about when they're going to go.

But my topic today, last but not least, is the guidelines development and implementation schedule for the SB guideline book. As you can
see here is basically a tentative schedule for the
development of the guidelines.

Now we are at today August 22nd.

Written comments are due on the 29th. We'd like
to have them earlier if possible because we have a
lot of development of the guidelines after this.

What we're shooting for is the
guidelines posted on September 20th. So we have
that amount of time, approximately three weeks
there, to get the guidelines in the book.

Basically the guidelines written.

We're planning on a committee workshop
on October 4th and this would be to discuss the
staff draft guidelines.

After the workshop we're planning,
actually we would be coming out with committee
proposed guidelines 30 days before the proposed
adoption, which would be 12/19.

Now as you can see from there, there are
other opportunities down the road to make comments
on the guidelines and the recommendations. The
first one after the 29th would be during the
committee workshop on October 4th.

After October 4th there is going to be,
we will have the committee proposed guidelines
out. Hopefully by that time most all of the major recommendations from the various parties will have been submitted.

There's still some opportunity probably to put out some comments on that but by that time, the committee workshop on October 4th, that period of time after that, which we'll probably have maybe another week or something after the October 4th date to give people an opportunity to provide some written comments in there.

The implementation of the guidelines is a companion issue here. All of this information is out of Senate Bill 1. As many of you have read the Senate Bill you are aware of the requirements here. The first bullet there basically is that we establish the guidelines and eligibility criteria. And that is by January 1, 2008.

In the meantime under PUC sections the publicly-owned utilities are required to initiate and complete a public proceeding to fund solar energy program by the same date.

So as many of you are aware it's almost, it's a Catch-22 situation. We have until January 1, 2008 to put out the eligibility of criteria. The publicly-owned utilities are required at the
same time to initiate their proceeding and put out their guidelines and criteria by the same date. So those are things that potentially could be in conflict. We have proposed solutions here that we can go through here in a second.

The other provisions here, the PUC codes basically require the PUC to determine eligibility of solar systems until the Energy Commission establishes eligibility criteria.

It also says that the PUC in that same time period is supposed to adopt a performance-based incentive program by January 1, 2008, also using some types of eligibility criteria.

So our proposed implementation schedule basically is from January 1st through December 31st of 2008. It would be basically a transition period to go from potentially a bare bones type eligibility program that would be put in place. And the publicly-owned utilities and the CPUC would have a year to transition over to these proposed provisions that have been discussed earlier today.

The staff recommends the formation of a working group to further the development of the efficiency requirements. We would like to have
some comments on that.

Finally the last bullet there. The effective date for all programs' conformance with state guidelines would be January 1, 2009. So it is basically giving everybody that one year to try to put all of these provisions, which the final guidelines would have in place.

So we're looking for comments and ideas people have on the proposed schedule. The earlier slide about our guideline schedule there is pretty much, that's what we feel we need to abide by. The transition period from going from when the guidelines have been adopted to when all of the provisions have been put in place for the one year.

We also would like some recommendations on updating procedures and stuff like that that you may have. ...Consider that for your written comments if you don't have any today. So that's all I have to my presentation.

MR. PENNINGTON: Are there any questions about that?

MS. BLUNDE: Julie Blunden with Sun Power. So just so we get a, we're clear on what we're actually going to see on the 20th of
September.

When you talk about guidelines, the way I'm used to working with the Energy Commission is the Energy Commission puts out like a guidebook or a redline to a guidebook and people get to comment on it and you're real clear on what the changes are going to be.

And I think what you're saying here is you're not going to be putting out a guidebook per se. Is it going to look more like the document that has already been delivered or is it going to look like something different that is closer to a guidebook?

MR. MILLER: Well it may be a little bit of semantics between guidebook and guidelines. Senate Bill 1 specifies guidelines so we wanted to be consistent with that language there.

MS. BLUNDEK: What I'd say is, going back to my earlier comment about the need for like a clear set of decisions. The thing that is so handy about working on a program specifically is you've got a guidebook. You know exactly what proposal, what operational changes are being proposed.

To the extent that you are not going to
be delivering something that is essentially a
draft guidebook for use either to be inserted into
the PUC's -- You know, there's a single handbook
which we worked on last fall and have since
updated and we have an advice letter. Obviously
there will be an advice letter process. I don't
know. Have you guys worked out the advice letter
discussion between the PUC and the Energy
Commission? Okay.

So I think it would be worthwhile to go
through the calendaring exercise. Figuring out
how the advice letter process would work should
these, whatever the guidelines are, require advice
center adjustments in the PUC program.

And you know, ultimately what we need is
not a guideline. We need language for a handbook
or language for an operational manual of some way,
shape or form.

And I'm wondering if to shortcut the
exercise you could actually just either extract
the piece of the New Solar Homes Program that you
propose to use as-is or to adjust per whatever
your guidelines are or to extract the similar
language out of the handbook and say, we're going
to use this one instead.
But to get very concrete about, here is what we think you should do. Because, you know, I'm again going back to a bunch of the standard discussions. I think at the end of the day what you're saying is, you want to use a calculator that has these elements in it.

Rather than going into the discussion around here's shading and here's this and here's that, you say look, here's what we're proposing. Very concretely. And it has all these attributes in it.

Then we don't end up in the same position where we're going back and saying, well what does that mean operationally. I'm concerned that what we could end up with is a time period between September 20th and October 4th where we're still fuzzy on what it is that we think is going to be trying to be operationalized by January 1st.

So to the extent, my recommendation would be to try to get as concrete as possible about a handbook or a guidebook language. Or, you know, if it doesn't exist yet create some that people can respond to.

MR. MILLER: Okay.

MR. PENNINGTON: I think that's really
consistent with what we were thinking. We're
developing the format of that document in our
minds right now but that is very consistent with
what we have been discussing.

MS. BLUNDEN: Great, thanks.

MR. PENNINGTON: Any other comments?

Yes.

MS. BROWN: My name is Leslie Brown, I'm
with the City of Santa Clara, Silicon Valley Power
and Municipal Electric Utility.

I've hesitated on making any comments
today because I had not had a thorough opportunity
to read through the report as much as I would have
liked to yet, and I am also not sure if what the
content might be of a coordinated municipal set of
comments would be. But I did want to comment on a
couple of points that, Sandy, you mentioned when
you were talking about the coordination of these
guidelines and schedules with municipal utilities
and any publicly-owned utility programs that might
already be in place.

I know that over the last, over the last
couple of years we've had several conversations at
different times. We have a working group of PV
managers within the public utilities that has been
together for quite some time.

And in the last couple of years I know that we've definitely invited and had multiple conversations with the Energy Commission, legislators, trying to come together with bringing together our programs and what is going to get on with the investor-owned utility territories.

And trying to have a bit of cohesiveness but still maintain our independence and our ability to have our program guidelines that are appropriate for our customers within our service territories, dictated by our governing boards. Which are our councils, our different utility boards that are in place depending on where we are within California.

I cannot speak for everybody, although I think a lot of the other program managers at other utilities would probably agree with me. But we were not expecting that this guidebook would be dictating program design and implementation details for the publicly utilities. At least I know I wasn't for our utility.

And I know I have been involved with conversations over the last couple of years with not just PG&E and the other investor-owned
utilities but with members of the Commission, the
Energy Commission, and other legislative bodies.

Where we were under the impression, or
at least I know I was, that we were going to be
having some conversations about design and system
components and not about overall implementation of
program design and decisions beyond a component or
an agreed-upon standard of elements within a PV
system and not necessarily administrative
decisions that were going to be not within our
ability to dictate what is appropriate for our
customers, responding to our own management,
utility boards.

So I hope I haven't overstepped my
bounds in making those comments but I felt like I
couldn't not say something. And I don't want to
be disrespectful in my comments and I don't want
to presume that I am speaking for anybody else
other than myself and my own experience in the
eight years that I have been with Silicon Valley
Power and been a part of Energy Commission
hearings and a part of legislation and a part of
program design for PV programs within the state of
California and municipal utilities.

I guess that's what I have to say, thank
you. Did you have any comments or questions or a response or anything that I can address? Okay, thank you.

MR. PENNINGTON: I think those are legitimate comments. Any other comments?

Okay, well thank you very much. This is a tremendous turnout. We got a lot of input and we really appreciate it.

(Whereupon, at 4:05 p.m., the Committee Workshop was adjourned.)

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CERTIFICATE OF REPORTER

I, JOHN COTA, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Committee 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 31st day of August, 2007.

John Cota

JOHN COTA