COMMITTEE WORKSHOP

BEFORE THE

CALIFORNIA ENERGY RESOURCES CONSERVATION

AND DEVELOPMENT COMMISSION

In the Matter of:	)	
	)	
2008 Rulemaking on Appliance	)	
Efficiency Regulations	)	Docket No.
	)	07-AAER-3
Implementation of California Code	)	
of Regulations, Title 20, Section	)	
1601 through Section 1608	)	
_____	)	

CALIFORNIA ENERGY COMMISSION

HEARING ROOM A

1516 NINTH STREET

SACRAMENTO, CALIFORNIA

TUESDAY, JANUARY 15, 2008

10:06 A.M.

Reported by:
Peter Petty
Contract No. 150-07-001

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Arthur Rosenfeld, Associate Member

ADVISORS PRESENT

Tim Tutt

John Wilson

STAFF PRESENT

Melinda Merritt

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Gary Flamm

ALSO PRESENT

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Pacific Gas and Electric Company

Alex Chase
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Randall Higa
Southern California Edison Company

Ramin Faramarzi
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Sempra

Jon McHugh
Heschong Mahone Group

ALSO PRESENT

Noah Horowitz
Natural Resources Defense Council

Tracey Peacock
3M Optical Systems Division

Ted Pope
Chris Calwell (via teleconference)
Energy Solutions

Luis Fernandez
California Lighting Technology Center

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Ecos Consulting

Wayne Morris (via teleconference)
Association of Home Appliance Manufacturers

I N D E X

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P R O C E E D I N G S

10:06 a.m.

PRESIDING MEMBER PFANNENSTIEL: This is an Energy Commission Efficiency Committee workshop, a scoping workshop on the next round of appliance efficiency standards.

I'm Jackie Pfannenstiel; I'm the Chair of the Energy Commission and the Presiding Commissioner on the Efficiency Committee. To my left is Commissioner Art Rosenfeld who is the Associate Member on the Efficiency Committee. To Art's left is his Advisor, John Wilson. And to my right is my Advisor, Tim Tutt.

I have no other comments to begin. Art, do you have any?

ASSOCIATE MEMBER ROSENFELD: No. Welcome.

PRESIDING MEMBER PFANNENSTIEL: Welcome. Melinda.

MS. MERRITT: Good morning, everyone. I'm Melinda Merritt with the appliance efficiency program in the buildings and appliances office. I have a little script to read here to get us started.

PRESIDING MEMBER PFANNENSTIEL: Melinda,

can you get the lights over your slides so we can see them a little better.

MS. MERRITT: Okay, is that sufficient?

PRESIDING MEMBER PFANNENSTIEL: Yes, that's fine, thank you.

MS. MERRITT: Just a few housekeeping items before we begin. For those of you not familiar with this building, the closest restrooms are located just out the door. I think everyone's rather familiar with where those are. There's a snack bar on the second floor under the white awning.

Lastly, in the event of an emergency and the building is evacuated, please follow our employees to the appropriate exits. In that event we would reconvene at Roosevelt Park, which is located diagonally across the street from this building. Please proceed calmly and quickly, again following the employees with whom you are meeting, to safely exit the building. We're not expecting anything along those lines to happen, but important information.

We'd ask that if you have a cellphone that you either turn it off or put it in vibrating mode for the duration of the workshop.

Also you should be advised that there is a webcast and your ancillary conversations could be picked up on the microphones, so please consider the environment within which you're speaking.

So, we are going to be considering today the Efficiency Committee's rulemaking activities to amend the appliance efficiency regulations. This is a proceeding where the order instituting the rulemaking was adopted in December of last year. We have copies available for you in the entry of the adoption order, itself, of the Committee workshop notice. We also have some other background materials for you that we will be presenting in context later.

The appliance efficiency regulations are contained under the California Resources Code, Title 20. These govern all appliances sold or offered for sale in California. The regulations, themselves, contain not only the efficiency standards, which are either minimum operating efficiencies, or design criteria for both energy or water use. But the regulations also specify test methods that must be used in establishing the efficiency of the appliance.

The regulations also contain marking and labeling requirements for the appliances that we regulate. And the regulations also prescribe manufacture compliance certification data that must be submitted. And we also have approval requirements for any testing laboratory that's used to establish the efficiency.

The Energy Commission regulates a wide variety of appliances. This is just some informational background of the variety and complexity of the appliances that we do consider.

The Energy Commission has a, I guess a growing appliance efficiency program. We've added some additional staff this year and we have some new faces to carry on the work of the program.

The work of the program is not only standards development and adoption, which is the focus of our meeting today and the rulemaking activity. We have a very important and labor-intensive compliance certification and database activity.

We have ongoing outreach and education activities targeting manufacturers and distributors, as well as trying to answer all the questions the public may have regarding the

program.

And finally, we do have compliance survey work, testing and enforcement activities.

As stated in the order instituting the rulemaking, the scope of this rulemaking is to focus initially on general purpose lighting to help meet the requirements of Assembly Bill 1109. And these would apply to indoor residential, indoor commercial and outdoor lighting products.

Also, this initial rulemaking we expect to focus on battery chargers. We consider that there may be some necessary updates and clarifications to the existing standards that require rulemaking. And then finally there may be other priority matters that the Committee may want to add to the agenda.

The order provides that the rulemaking may be divided into phases. And that the scope of each phase will be established and modified as needed by the Committee.

This slide presents a schedule assuming that there's an initial phase to this rulemaking that focuses on general purpose lighting. And this is intended as much to give you just a brief idea of the process that we're involved in in the

rulemaking.

We expect that following this workshop the Committee will establish the scope of the initial phase. And that will hopefully be done within the next couple of weeks.

We will have about two, two and a half months in total to receive and evaluate proposals, specific proposals for amendments to the regulations. At which point staff will assemble and publish the draft standards or proposed amendments.

Typically we follow that release with a staff workshop. There may or may not be a need for revisions or discussions. There may be a Committee workshop in the early summer, if needed. But finally we expect to release the proposed standards, also known as 45-day language, along with the staff's CEQA analysis, in early September.

The schedule is driven by the need for Commission adoption of lighting standards in response to Assembly Bill 1109. And we're targeting the December 3rd business meeting, December 3, 2008.

Assembly Bill 1109 is, again we've

provided copies in the entry for anyone who wants to read the bill in total. It requires that on or before December 31, 2008, the Energy Commission will adopt minimum energy efficiency standards for all general purpose lights on a schedule specified in the regulations.

And that these regulations, in combination with other programs and activities, will reduce average indoor residential lighting energy by not less than 50 percent relative to 2007 levels; and reduce average indoor commercial lighting and outdoor lighting energy use by not less than 25 percent relative to 2007 levels.

These very ambitious energy reduction goals are expected to be in place by 2018. Or have been achieved by 2018.

So, in order for the Energy Commission to implement Assembly Bill 1109, again we need to adopt regulations for general purpose lighting this year by December 31, 2008.

And in order to achieve the lighting and energy reduction requirements we need to do several things. This will require us to evaluate statewide residential, commercial lighting electrical usage data and establish a 2007

baseline lighting electrical energy use.

We will need to evaluate the expected growth in electrical lighting demand. We will also need to identify, evaluate and prioritize other programs and activities outside of the rulemaking process that may include amendments to the building energy efficiency standards, more aggressive outreach and education activities targeted at manufacturers, distributors and consumers, and possibly rebate and incentive programs.

At this point I'm going to turn the presentation over to Harinder Singh. Harinder is -- he joined our staff last year as our program engineer and will be picking up, in particular, the lighting and battery charger information.

MR. SINGH: Good morning. My name is Harinder Singh. I am technical staff for appliance efficiency program.

My first slide presents the current state regulated lighting. These are the lights we currently regulate. And this provides us -- it went into effect January 1, 2008. And the estimated projected wattage savings or reduction is 5 percent for the current regulations in effect

right now.

Next is we have this federal energy bill, HR-6, which would go into effect -- will become effective 2012 to 2014 for different wattage -- and it's going to provide approximately 28 percent wattage reduction from 2012 onwards.

And then we have tier two. For tier two DOE is required to start a rulemaking by 2014. And the DOE must finish the rulemaking by 2017. And that rulemaking, the adopted standard will take effect in 2020.

And if the DOE fails to adopt any standard by 2017, then the backstop requirement kicks in, which would give 45 lumens per watt for the lamps. This would give California 60 percent wattage reduction after 2020 if that goes into effect, if the backstop measure goes into effect.

Since California is preempted so tier one will provide -- California has two options, one option. That it can adopt the tier one standards one year prior to the federal effective date, which is 2012 to 2014. So, California can adopt these standards 2011 -- for different 2011 to 2013.

And the tier two would take effect at 45

lumens per watt if the backstop requirement kicks in. Then 45 lumens would take effect in 2020 for the federal. But California can adopt that requirement by 2018.

The question here is can California adopt different standards for tier two. So we are seeking proposals, and also ideas and identify the opportunities which can take us to 50 percent wattage reduction by 2018, as is required by average 50 percent reduction, as is required by the AB-1109.

And this is the end of the lighting issues on the federal energy bill.

And by Assembly Bill AB-1109, we are also required to come up with a 25 percent reduction for indoor commercial lighting and outdoor lighting. So we may have work with Title 24 or other areas to come up with some requirement or some ideas to how to reduce this by 25 percent by 2018. And that ends the lighting part of it.

I'll move to the battery chargers next. Battery chargers, currently there are over 600 million products through the United States, different battery chargers, out of which approximately 120 million different battery

chargers are in California. These are the approximate numbers.

And the battery chargers include small household appliances, personal care products like electric shavers, high-power battery-operated forklifts.

The amount of energy consumed by the battery chargers is quite a bit. It varies actually from size. System efficiency of battery chargers are very low, often 30 percent or less. Significant savings can be achieved by improving efficiency. Battery chargers in active mode can draw as much as from 5 to 20 times more energy than is actually stored in the battery.

I tried to show the power consumption. This is the active mode, power consumption is large. And time taken to charge is a medium, which varies from six to 12 hours. And the maintenance is the medium power consumption, but it has a large time. And the standby mode, the power consumption is small, but the time is large because the battery charger stays plugged in. People unplug their telephones or whatever the devices are. So this accounts for quite a bit of energy.

Since advanced designs for the battery chargers are available, that can improve energy consumption by more than 35 percent. So, again, the significant energy savings can be achieved with the use of efficient battery chargers and millions of kilowatt hours per year.

Electric energy savings generated by use of efficient battery chargers would result in preventing the release of millions of tons of greenhouse gas emissions.

And the current situation is that DOE adopted a test method in July of 2006. The test method adopted by the DOE measures two modes of power battery chargers, maintenance mode and standby mode.

And California Energy Commission, PIER, Public Interest Research Program, funded ECOS Consulting to develop a comprehensive test method. And ECOS published their test method in September 21, 2007. And ECOS test method covers all types of residential and commercial battery charger systems, testing in active mode, maintenance mode and standby mode. One more thing, that this test was also funded by PG&E.

The EPAct 2007 requires the U.S.

Department of Energy to determine that no energy conservation standards are technically feasible or economically justifiable or cost effective for battery chargers by July 2011. Or if they find that it's cost effective and feasible, then prescribe standards for battery chargers by July 1, 2011.

And also DOE has to prescribe a test procedure for the battery chargers at no later than 31st of December 2008. At this time they have one test procedure which covers only the maintenance and the standby power. We don't know what DOE's going to adopt by December 31, 2008.

So Energy Commission will consider adopting a test method which was developed by ECOS and also will consider prescribing standards for battery chargers.

2000 rulemaking updates, clarifications and other priority matters. Updates to clarify standards and make consistent with the federal legislation. That's section 100 changes.

And then we also are going to present to the Efficiency Committee televisions -- consumer electronics which includes televisions, set-top boxes, home entertainment system, game consoles

and other items. As also as stated in SB-332.

At this time I would like to, if anybody has proposals, I have a template available. My business card is here at the desk, so if you are interested in submitting proposals please email me. I will send you the template for submitting your proposal. And thank you very much.

Any questions?

The next presentation is by PG&E. And Alex Chase is going to be making the presentation. Thank you.

MR. FERNSTROM: Good morning, Commissioners, Staff and interested parties. I'm Gary Fernstrom from the Pacific Gas and Electric Company. I'm a Senior Program Engineer at PG&E and the Project Manager for our appliance standards project.

I'd like to very briefly introduce our presentation for you this morning. I see there are a number of interested parties in the audience, many of whom wish to speak, so we'll try and be as quick as possible with our presentation.

Our team consists of the American Council for an Energy Efficient Economy, the Davis Energy Group, Energy Solutions with Alex Chase at

the podium who will do the majority of the presentation for us, ECOS Consulting, LED Consulting, Lighting Wizards and the California Lighting Technology Center is supplying technical advice to us on lighting issues.

I'd like to give you a very quick history of the codes and standards program. PG&E developed this program in 1997, just a little over a decade ago. Its purpose was to bring into code energy efficient measures which we have seen through our other programs to offer a highly cost effective opportunity for the State of California.

So, it's a supplement to voluntary programs such as emergency technologies, information, education and our incentive programs.

I'm happy to say that we've worked quite collaboratively with the California Energy Commission and the PIER program to make a continuum of energy efficiency efforts that range from the development of new technology to bringing into code technologies that are fairly prevalent in the marketplace, and offer energy saving opportunities particularly for those that aren't influenced by voluntary measures.

We've presented a number of code

advocacy recommendations, both in the building standards and appliance standards, over 50 of them; most of which have been adopted into California code, many of which have been adopted by other states as well as agencies of the federal government.

So the program consists of recommendations for improvement to the code language; training and education associated with that; and work at the federal level where that is constructive with respect to codes that have results in California.

Only recently have we gotten energy saving credit toward our goals set by the California Public Utilities Commission for this program. We've pursued it mostly through the past decade because it was the right thing to do, even though credit wasn't forthcoming. Now that we do get credit and the energy saving goals set for the utilities by the Public Utilities Commission are very high, it's critically important that attribution be allocated correctly such that we can realize some savings from our efforts in this area in order to sustain our work here.

The program has gone statewide, and I'm

happy to say that the other utilities are participating in codes and standards efforts and have various proposals and efforts underway, as well.

So, I'd like to take just one more quick moment to introduce the others at PG&E here who are involved in this effort, being that we've had some new staff and staff changes, as well. Pat Eilert is our Program Manager for codes and standards; if he'd just raise his hand; he's sitting out here in the audience.

Ed Elliot is a Senior Project Manager at PG&E who has been helping, and will eventually be taking over for me in this area. And Lianne Williams is a new Associate Engineer who's also helping with codes and standards.

So we have for you this morning 29 topics. We realize that the Commission resources are limited and we may not be able to initially address all of those. We believe that all 29 topics, however, are cost effective and are merited in terms of their consideration.

Of these, 12 are lighting related; seven are related to consumer electronics and plug loads; three are related to HVAC and

refrigeration; and seven are miscellaneous.

We're prioritized these recommendations and case studies, particularly with respect to Assembly Bill 1109. And you will see that we've given our recommendations a high priority, the highest priority, that is, a high priority, medium and so on, based on how we think they relate to your legislative requirements in this proceeding.

The next slide we have shows an estimate of the overall energy savings at time of full replacement if all of these measures are adopted on schedule. About 1710 of the measures -- pardon me, 1710 gigawatt hours are subject to federal preemption, and we're a little uncertain about the potential savings there, as the outcome depends at least in part on action of the federal government.

We'd like to also show you the implications of this in terms of megawatts. In 2005 our Title 20 efforts were the equivalent of about two combined cycle gas-fired power plants. The opportunity associated with the recommendations we're making here in 2008 are slightly over that. So demand reduction is critically important in terms of utility economics and consumer economics and price. And these

recommendations have a significant impact in that area.

We're also showing you what the total potential impacts are with respect to greenhouse gas reduction after stock turnover. And you'll notice that if all of our recommendations are adopted on schedule it amounts to about 11 percent of the electricity greenhouse gas reduction goal.

Eleven percent may not seem like a very big number; on the other hand, this just serves to illustrate that it's critically important that the California Energy Commission act aggressively in this area to get whatever savings each of these opportunities has to offer as the statewide strategic goals are very aggressive.

The next slide, which Alex will go into greater detail later, shows the annual electric savings by measure that we're discussing. And rather than speak to those individually, I would just ask you to take a close look at the slide.

I think a couple of measures in here that have high opportunity that have recently been suggested are portable lighting fixtures and game consoles. Actually, Gary Flamm of the California Energy Commission suggested portable lighting

fixtures and we agree, given the federal involvement with general service incandescent lamps, there's a tremendous opportunity here in California to take a look at portable lighting fixtures with respect to the energy savings that might be achieved through those measures.

The next slide here looks at the same measures in terms of their megawatts of peak demand reduction. In consideration of the Huffman Bill, Assembly Bill 1109, we are specifically looking at ten measures having to do with lighting. And we believe this will help the CEC with respect to trying to come into compliance with the requirements of the Huffman Bill.

That concludes my brief introduction, and I'd like to turn the presentation over to Alex Chase to continue.

MR. CHASE: Thank you, Gary. As Gary mentioned, we are -- in our presentation we have 29 specific topics. Because our time is limited, and since I know a lot of folks here have other presentations to present, my general approach will be to highlight just a couple key points for each of our standards focused on AB-1109 topics and consumer electronics and plug loads, which we see

as the two significant opportunities here.

I would encourage folks to download our presentation to get further details. For each of the topics we've provided estimated stock and sales in California, energy and demand savings estimates, and potential savings from our proposed standards levels.

In addition, by January 30th we will be submitting detailed case reports and/or CEC templates that will provide a comprehensive technical, economic and market information for each of the topics related to this workshop.

The first topic I'd like to discuss is general service lighting. And as Harinder mentioned in the earlier presentation, the federal bill set tier one levels that would become effective 2012 through 2014, and gives California the opportunity to move those dates up one year for each bin.

And the subsequent tier two standards, which are to be determined on the federal level, California can adopt those levels January 1, 2018. So we are recommending that the CEC adopt general service lighting standards as early as permissible as the federal bill allows.

And in the afternoon session we will have Chris Calwell on behalf of PG&E present a more detailed discussion on general service lighting and the implications for the AB-1109 bill.

The next topic is linear fluorescent fixtures. And for this topic we propose that the Commission set ballast efficiency standards for new commercial and residential fixtures that are four foot and eight foot in length. Primarily the standard will be based off the Consortium for Energy Efficiency, CEE, high-performance T8 specification levels.

And in some cases we may recommend standards that slightly go beyond CEE levels in product areas where there has been significant growth in new, more efficient products.

This topic has a relatively significant savings opportunity compared to the other topics discussed today; represent nearly 2000 gigawatt hours a year in savings after stock turnover; and approximately 560 megawatt peak demand reduction.

The next topic is portable lighting fixtures which Gary mentioned earlier. And we recently added this primarily in response to the

aggressive AB-1109 goals. And we're currently assessing a couple standard scenarios and will most likely recommend a tiered approach to this standard. We're setting certain levels that become more stringent in phases.

One of the standards options that we're currently assessing is to limit the maximum total fixture power draw such as around 35 watts per fixture. And an alternative approach is we're looking at requiring fixtures that meet the current EnergyStar specification levels.

The next topic is metal halide fixtures. And California set efficiency standards for this during the last cycle. The recent federal energy bill explicitly excludes California's metal halide fixture standards from preemption and provides a one-time opportunity for the CEC to adopt revised standards by January 1, 2011.

Therefore, we recommend the CEC adopt revised standards that require metal halide fixtures to have equivalent -- electronic or equivalent efficiency ballasts. Specifically we recommend ballast efficiency of 90 percent for 150 to 300 watt fixtures, and 92 percent for 300 to 500 watt fixtures.

This is a -- the next topic is decorative string lights, and this is a photo of a number of different types of decorative string lights, both incandescent and the increasingly popular LED decorative string lights.

We recommend at two-tiered standard approach for these lights. Tier one would set a maximum power level draw at .25 watts per lamp; and a tier two standard would set a maximum power level at .1 watts per lamp.

Tier two essentially would require low wattage incandescents or LEDs. And tier two would establish the majority of decorative lights being LED.

We've also been assessing the opportunities for standards for nightlights. And ECOS Consulting, a partner on our technical team, has been testing dozens of these nightlights, three of which are shown here in the picture.

On the left is a nightlight used for way finding, in the center for signal, and on the right a nightlight is basically a novelty light.

We are recommending that the CEC adopt standards that set the annual energy use per nightlight at less than or equal to 3 kilowatt

hours per year with a maximum of 0.5 watts limit for standby power.

Nightlights on the market will meet this standard primarily through utilizing low power light sources such as LEDS and/or automatic switches such as motion detectors and photo switches.

The next topic, which again we've recently added, is shelving lighting systems. Again, this is a product that could help California prepare to meet the commercial goals of AB-1109, which is a 25 percent reduction in both indoor and outdoor lighting.

This photo here was taken by Kate Conway of LED Consulting, another partner on our team. It basically shows a drugstore that has five vertical shelves, each shelf has about 25 linear feet of linear fluorescent lighting. And it appears that the shelfing units come with the lighting with it.

We are currently assessing standards opportunities and we recommend that California consider standards that could be similar to the current Title 20 standards for under-cabinet lighting.

Next topic is illuminated address numbers. We are recommending that the standards be set primarily aimed to replace the existing incandescent lighting products in the market with LED products, with photoswitches to eliminate these address number signs being on 24 hours a day.

Next topic is dimming ballasts. For dimming ballasts we propose that the Energy Commission consider efficiency standards for dimming ballasts, looking to harmonize with the proposed levels in the expressed Title 24 45-day language.

That concludes the cluster of lighting-related projects that could help California meet the aggressive goals of AB-1109.

And the next cluster of slides I'd like to present are seven topics related to consumer electronics and plug loads. We currently have seven topics, including television, set top boxes, video display equipment, battery chargers, game consoles plug-in luminous signs and power supplies for signs that all fit in within this category.

And I think, as many folks in this room are probably aware, electronics represents one of

the rapidly growing end-use sectors within California. Energy Solutions conducted a study for PG&E's mass market sector, which is primarily residential and small commercial, showing various scenarios for load growth within that sector, looking at 33 unique electronic devices.

And this graph here shows the bottom bar -- bottom axis is 2005 through 2010. On the left, which is represented in the bars, is gigawatt hours per year. And the line graph represented by the percentage is the percentage of consumer electronics as a part of the overall mass market electricity use.

And you can see how the bars are rising, and in this one scenario the relative end use goes from about 18 percent in 2005 to 26 percent in 2010.

Now, these numbers may be off by a percentage point or so. But the illustrative example here, which is represented in other studies looking at similar things, is that this is one of the fastest growing end-use segments. Which is why we are prioritizing these seven topics as high-priority topics going forward.

The first topic in this category is

battery chargers. And as Harinder mentioned, some of the details specific to that, our general recommendation is that the CEC set standards for active maintenance and no battery modes.

And we also recommend that the Commission utilize the battery charger test procedure developed by ECOS Consulting in EPRI, which was funded by PG&E and CEC PIER. And, again, in the afternoon session the PG&E technical team will present a more detailed presentation on battery chargers relative to the federal bill, and more specifics in terms of what we recommend.

The next topic is televisions. Most people here are probably familiar with some of the common tv trends, generally getting bigger, average usage time is increasing, and there's a trend towards high-definitions capabilities. Tvs will soon outnumber people in the United States, and the average household is watching over eight hours of tv per day.

The current energy use of tvs in California is approximately seven gigawatt hours per year, representing about 5 percent of all residential electricity.

We're recommending that California set a

standard that addresses active mode. And following up on the standard that addresses a maximum standby level. Primarily because active mode accounts for about 85 to 90 percent of the tv's overall energy use.

For an illustrative example here we have shown the savings for setting the standards, standards set at the proposed EnergyStar specification levels, which will become effective in November of this year.

Currently estimates from EnergyStar is 30 percent of the tvs on the market today will be able to meet that EnergyStar level. In that hypothetical standard scenario California would achieve about 2300 gigawatt hours per year after stock turnover.

Next topic is digital set-top boxes for cable and satellite purposes primarily. Set-top boxes are one of the fastest growing product categories that we're studying. The stock in California was estimated to increase about 130 percent from 2005 to 2010.

And perhaps the most significant energy characteristic is the fact that on average about 80 percent of energy consumption occurs in standby

mode when most users perceive the device as being off.

Therefore, we're recommending that the Commission consider a standard that has at least two elements. One is to set a maximum standby level at or around 10 watts; and to require the set-top box to have an auto power down feature after a certain length of time, for example four hours or so.

The next topic is video display equipment. And primarily this covers computer monitors, but we're also looking at standards opportunities for nonconsumer professional displays which are increasingly being utilized in such places as airports, retail stores and hotels.

We recommend that the Commission consider standards for all operating modes on standby and off. And we also will most likely recommend a tiered approach. We're currently looking at savings approaches that would set the first tier at the current EnergyStar specification level for the first tier, and then going more stringent in subsequent years. I should note that the computer monitor EnergyStar specification has been effective since January 1, 2006.

We're also studying the opportunities for setting standards for game consoles. And this is similar to set-top boxes where we ar recommending that they have a auto down power requirement and a maximum standby power level. TIAX, on behalf of CEA, conducted a survey in, I believe, 2006 showing about 36 percent of U.S. households owned at least one video game system. And for those households that owned at least one system, they had an average of 1.5 systems.

And the general trends is with each subsequent version of the major game consoles out there, they're requiring higher capability, which is driving the power use up in these game consoles.

Next topic is plug-in luminous signs. And here's a number of photos to illustrate what types of signs we're looking at. On the top left here is a -- all three up here are internally illuminated box signs, that's what we're calling them. And from left to right you have an incandescent sign showing a pizza price; a fluorescent Western Union sign; fluorescent ATM sign.

We're also looking at exposed light

source signs, also known as skeleton or matrix signs. And here's an example of a neon sign. And right next to it is a LED sign. We're also looking at pull signs as evidenced here on the bottom right-hand corner. And here's another neon open sign -- I'm sorry, LED open sign.

For these types of signs we recommend that the Commission consider standards that will follow two approaches. One establishing a watts per square foot for different sign types. And also requiring certain controls such as timers, photosensors and on/off switches.

We're also looking at power supplies for luminous outlines, text and channel letters for indoor use. And again we have a number of photos taken by our consultant, Kate Conway with LED Consulting, looking at neon outline signs, this photo up here; channel letter signs in the photo in the upper right; these plug-in neon signs in the lower left here; and generally looking at the power supplies to the transformer for neon ballasts for fluorescent signs and the circuit driver for LED signs.

And I should mention that Edison has conducted some market analysis for neon signs. We

are collaborating with them on aspects of this study.

Generally we propose that the Commission consider standards that are harmonious with the Title 24 power supply signage efficiency requirements.

So that concludes the cluster of topics related to consumer electronics and plug load. The remaining topics listed here ar the three topics for HVAC and refrigeration, and the ten other products -- seven other products that fall within the miscellaneous category. I'm not going to go through each of these in detail, but, again, we spell out our recommendations in our publicly posted presentation and will be providing subsequent case studies or CEC templates on a majority of these topics.

I should mention that ACEEE, another member of the PG&E technical team, has completed case reports for residential refrigerators, premium efficiency motors and fluorescent tube lamps. And PG&E has successfully impacted federal standards activities for motors and refrigerators. And the fluorescent tube lamps, there's going to be a DOE hearing in future years.

And we recommend that the CEC stays actively involved with that, as will PG&E. The potential energy savings with those measures are approximately about 3000 gigawatt hours, which relative to our other topics presented here would put it in the top slot in terms of energy savings.

We also would like to recommend some refinements to the current Title 20 pool and spa standards listed here. I won't get into the details here, but I should mention that PG&E has been actively engaged with the pool and spa industry and we expect that the recommendations to be consensus agreements.

With that, this is a slide that Gary introduced earlier, and it's probably worth another 30 seconds going over. Again, we've broken down these 29 products into highest priority, high priority, medium priority and no further action at this time.

The products that are in gold here are all related to AB-1109. And the relative circle size is gigawatt hours after stock turnover.

So, as Gary mentioned, we propose that the Energy Commission consider all of these standards going forward, but due to limited

resources and timing this is how we would prioritize our different topics.

With that I'll turn it over to Gary to provide some concluding remarks.

MR. FERNSTROM: So thanks, Alex. Consistent with what we believe your priorities to be, we'd like to recommend that you consider in the first phase our recommendations for general service lighting. The key topics are related to AB-1109. As you've indicated, battery chargers, metal halide ballasts and walk-in coolers where the Southern California Edison Company is the lead with respect to this proposal.

Not listed here you might also want to consider one or two gas measures where the Southern California Gas Company, Sempra is the lead.

With respect to other timing factors, tv and set-top boxes, Energy Star specifications become effective late in 2008. And many of these measures we're recommending are long-lived. So, to come to the point where the complete market has turned over will take substantial time. That would indicate that it's critically important that we reach some sort of decision and adoption on

these measures as soon as possible in order to comply with the legislative requirements.

So, just a couple of concluding comments. PG&E and the other IOUs are available to assist the CEC. Our codes and standards program includes recommendation for code language improvement. Advocacy at the federal level, where that makes sense, and training and education. We have staff and technical team resources. We've done market research. And so on.

We'd like to note the importance of engaging all of the key stakeholders early in the rulemaking process, so hopefully we can come to some sort of consensus. And not have surprises that would interrupt the quick resolution of many of these recommendations.

We also recommend that the CEC establish more definitive expectations for stakeholder intervention including assertions must be documented on a timely basis. And stakeholders that sit on the sidelines and wait until the last minute should be discouraged and not given undue consideration.

One last concluding comment. The savings opportunity we're pursuing here is large.

It needs to be pursued vigorously to the greatest extent possible to realize the AB-32 goals.

Historically Title 20 has accounted for a large part of both the utility and, I believe, the CEC goals with respect to energy efficiency. These appliance standards are, by far, the least costly and most impactful tool for reaching the population in general.

But, as we're currently proposing, our recommendations represent only around 11 percent of the needed impact. And subsequent rounds of Title 20 will be too late to have the required impact by 2020 that we're looking for.

So, given all of this, the costs and challenges faced in scaling up the energy efficiency standards are significant. And Title 20 needs to move quickly and aggressively in order to achieve all of what we're recommending, plus some more if we expect to get to the strategic state and federal goals that have been outlined.

This concludes our presentation. Thank you very much.

PRESIDING MEMBER PFANNENSTIEL: Gary, just a conceptual question. In looking at the list of possible appliances, some have fairly

substantial savings; and others, of course, have fairly minor savings.

Would you recommend that we just do, at some point, kind of a cutoff and say, given relatively limited resources, both within this agency and among the stakeholders whose participation we value and really need, shouldn't we really just be looking at those where you get a fairly big bang for the buck?

MR. FERNSTROM: That wouldn't be my recommendation. There are some opportunities that are smaller in terms of their absolute benefit, but may be less controversial and opposed in the process.

So, I would say, in terms of prioritization, we ought to pick those measures that we think have the greatest likelihood of success with the available resources, even though some of them may be smaller.

PRESIDING MEMBER PFANNENSTIEL: Thanks. Other questions? John.

MR. WILSON: Going back to Alex's slides, just quickly, slide 31, when you talk about consumer electronics, you had percentage of mass market. What is mass market?

MR. CHASE: For PG&E that's primarily residential with small commercial; primarily commercial operations that have 100 or less employees.

MR. FERNSTROM: So this would be appliances that are sold basically through retail to the general public, both to residential and small commercial customers, such as outlets through the Home Depot and Lowe's and so on.

MR. WILSON: So it's a category of products, not customer classes?

MR. FERNSTROM: It's a category of market including residential and small commercial.

MR. WILSON: Okay.

MR. FERNSTROM: We've reorganized our energy efficiency programs in terms of their delivery to serve different markets, what we call the mass market and the targeted market.

Mass market is all those entities that purchase through retail.

MR. WILSON: Okay.

ASSOCIATE MEMBER ROSENFELD: And what was the other one, mass market and?

MR. FERNSTROM: Targeted market.

ASSOCIATE MEMBER ROSENFELD: Targeted.

MR. WILSON: So, Alex, looking at this slide and then also the slide 8 where you had the horizontal bar graph of savings by appliance type, just trying to understand the big picture of how those two things relate. Because some of the things on this slide here on page 31 at not on slide 8. I'm not quite following this.

MR. CHASE: That's correct. That's a good question. This chart here was done for a study outside of the codes and standards process, kind of giving PG&E a general framework in terms of what the energy use is for a number of different consumer electronics.

So this figure here represents 33 unique devices. So it also considers computers and printers and fax machines that we're currently not recommending to the CEC in terms of adopting a standard.

MR. FERNSTROM: If I may I'd like to go back to Commissioner Pfannenstiel's question with a specific example. Someone has come up with a better photocell for parking lot lighting and street lighting. And what this better photocell basically does is it turns the parking lot light on a little later in the evening, and turns it off

a little later in the morning.

The photocell can't be set to turn on and off at exactly the same light level. There has to be what's called a ratio so it doesn't get confused about whether it wants to be on or off.

Well, this one company's developed a product to narrow that ratio; claims lighting savings can be in the range of 8 to 10 percent. This is a fairly small measure, but it seems to me like it ought to be a slamdunk, a no-brainer. If there are better photocells available, the state should be using them.

So that's a small measure that I think merits consideration even though it isn't really significant.

MR. PENNINGTON: Could I ask a following question to John's question? What percentage of the total electricity is the mass market? This slide is showing percentage of the mass market, so what would this be a percentage of the total?

MR. CHASE: I believe it's about 43 percent, but I can get the exact figure.

MR. PENNINGTON: So, 43 percent of the total is mass market?

MR. FERNSTROM: That would be my guess,

as well. The residential market, alone, is probably about a third, adding the small commercial component that we believe purchases out of that market. Alex's estimate is pretty close.

MR. WILSON: One more quick question. Alex, when you were estimating the energy use for these electronics products, did you look at the survey that the Consumer Electronics Association did and published a year ago? I'm just curious if methodologically you were taking that research into account.

MR. CHASE: Absolutely. That and other studies available in addition to product testing that ECOS Consulting has conducted, as well.

MR. WILSON: Thank you. This is an impressive presentation, Gary. Thanks.

MR. FERNSTROM: Thank you.

PRESIDING MEMBER PFANNENSTIEL: Now we have Edison.

MR. HIGA: My name is Randall Higa. I'm with Southern California Edison. I manage the statewide codes and standards program.

First I want to say thank you, Commissioners Pfannenstiel, Commissioner Rosenfeld, for the opportunity for Southern

California Edison to talk about our Title 20 activities. And thank you, Gary and PG&E team, for their presentation. Thank you, Gary, especially for sort of the overview of the codes and standards program.

The utilities do work as a statewide group and we do coordinate these activities. You'll see some similar projects that we're working on, in many cases jointly, to make sure that we're covering all aspects of a particular subject matter and/or all parts of the state.

Also want to say that I work with a team at SCE in the design and engineering services group. We have a number of project managers who manage these projects that we'll be talking about. One is in the audience, who's hiding back, Vireak Ly. Wave. One of our lighting experts.

We also work with a number of other organizations and consultants including the California Lighting Technology Center, led by Michael Siminovitch, who's back there. And other consultants such as HMG, Nancy Clanton, Jim Benya, ADM. We also do some of the cooling-related items with the Western Cooling Efficiency Center.

And last, but not least, one of the

primary groups that are in SCE that are working on Title 20 items is our refrigeration and thermal test center led by Ramin Faramazi. And he will be also presenting, as part of the SCE presentation, on some of the refrigeration items. So he'll come up and deliver part of this presentation, also.

The way I've broken up this presentation is to talk about first the lighting-related AB-1109 issues; some of the completed, current and future things that we're looking at. And then we'll cover some of the preemption items which primarily relate to the refrigeration-related item, and then other items, other topics that we've been working on.

So, timing-wise on some of these, we are looking at trying -- we haven't identified the timing of all the projects that will be talked about today. Some of them are more immediate and more ready for putting into regulations. And others may be something that we want to look at, scope out for future regulations. But that's something that we have some flexibility on.

So let me get right into the AB-1109 items. These are projects or phases of projects that have been completed. As noted earlier, we've

been doing some survey market assessment work on neon lighting. And by the way on these AB-1109 items that I talk about here, we'll be talking -- we have more detail on these that we'll be presenting in the afternoon. So I just want to sort of go through really quickly right now.

The neon study was basically looking at what percentage of neon lights are indoors, what percentage are outdoors. Also, an of that what is plug-in, covered probably more likely by Title 20 and those that are hardwired.

Now, a lot of the signage-related things we did work with the sign industry, and again we'll talk more about some of the results of that survey and what that could potentially mean, and how that could potentially fit in with some of the work that PG&E's doing.

Low ambient task lighting project was sort of a survey type work that we did, looking at the behavior of workers working in cubicles. If they have the ability to dim their ambient lights, their overhead lights, with having task lights, how much dimming will they actually do to their overhead lights, given a variety of different sorts of task lights and under-cabinet lights.

And what, you know, cut to the chase, we found that when you have good task lighting available and efficient task lighting, such as LED task lighting, you have the potential to reduce overall energy because most people or many people in the survey did reduce the amount of overhead lights when they had the task lighting available.

So that was kind of an interesting thing. And this sort of, again, fits in with some of the dimming ballast-related type things that PG&E is doing. And also starting to look at the effectiveness and what sort of task lighting we may want to look at as being regulated as part of Title 20.

Fluorescent sign lamp efficacy. One of the things that we looked at in talking with the sign industry is that we can't immediately jump to T5, T8 type lamps. So we decided let's work with T12 lamps and see if we can improve the efficacy of those lamps.

And with T5 and T8s, going to a rare earth tri-phosphor coding, you can increase the efficiency. So we tried doing that. So the idea was let's apply that technology to T12 lamps and see if we can improve the efficacy.

And then once you do that then you have to, to really get any energy savings, you're going to have to change the spacing of the lamp. So there's some component of what the geometry of the lamp placement is within the signs.

We worked with one manufacturer of lamps and unfortunately, with the tri-phosphor coating we did not get the energy savings or efficacy improvements that we were expecting. So we're going to be actually continuing this study and working with other manufacturers and see if we can improve the efficacy of those lamps.

This is a Title 20 workshop, but I just wanted to mention that there are some Title 24-related things. Certainly, I mean AB-1109 is going to be have to be met, not just with Title 20, but also Title 24, especially to get at some of the nonresidential lighting.

And just mentioning some of the other projects, as I mentioned, that ambient task lighting, I think does have both Title 20 and Title 24 implications.

Current projects that we're working on now, dimming ballasts. What we're doing with this is again sort of a market assessment study. We're

doing interviews and conducting surveys with specifiers of light, of ballasts, to see how many of them, how often do they specify dimming ballasts; if not, why not. And then if they do, what has their experience been with the use of those dimming ballasts.

Again, it's sort of a market potential study. Again, this will help feed into some of the other dimming ballast work that's being done by PG&E and others.

I just wanted to mention the super CFL group that has been convening. The purpose of that group is to develop specifications and CFL lamps that have the ability to dim; high color rendition index; and I'll say a more preferable color temperature.

It's a statewide program, meaning that all the utilities are involved, some industry, and also -- and even SMUD is involved with this super CFL group.

Again, some Title 24 projects that we are working on, also, in concurrence with our Title 20 work.

Items that we're looking at. As I mentioned, task lighting. We had some experience

with LED task lighting, both under-cabinet as well as portable. And I'll talk more about some of the findings of that study in terms of what we found as important drivers for getting these types of products more into the market, and a way to regulate them effectively.

We're going to be probably looking more at the office, nonresidential applications. So it will sort of dovetail with the PG&E work that's doing mostly residential, but obviously there will be some overlap that we'll be coordinating on.

Neon lighting kits. Again, we're looking at various things. I'm not going to go into too much detail on that right now.

Ceiling fan and landscaping lighting kits. These are interesting ones. Actually the ceiling fan is the interesting one. We have another related to that, but they're really hardwired devices. But they're something that you go into Home Depot and people generally don't hire contractors to put these in. They just buy them and put them in, themselves. So they're kind of effectively plug-in appliances.

So we're looking at what sort of way that they can be regulated. Again, maybe sort of

a maximum wattage type of requirement there.

Landscape lighting kits. Again, we're talking about the malibu-type plug-in lights, either for pathway lighting and/or, you know, landscape lighting of trees, et cetera.

Lighting options for vending machines and beverage coolers. Because our refrigeration test lab does a lot of work with vending machines, this is sort of a natural part of that work there. And, again, perhaps having a maximum wattage requirement for the front of the vending machines.

And this is one area where, again, we've worked with industry to get an understanding of what the lighting requirements are, and the importance of the marketing requirements for that light level. So, again, we're looking at ways for those requirements to be met, but doing it with lower energy use.

Directional lighting. We're looking at lamp types that are more directional in nature. Again, we're not sure on how we're going to be approaching this. I think this is really an early sort of scoping type that we would look at doing.

Lighting controls, the same way. LED open signs. Again, working with PG&E on that, and

also the sign industry.

Again, on all these sign industry things we're working very closely with the sign industry to see, you know, what makes sense and on the timing and how to incorporate these into regulation.

Track lighting kits. That's one that's similar to the ceiling fans that are hardwired, but still sometimes you buy in a box, go home and install it.

Again, the communicating -- with ballast luminaires. Again, perhaps progress from the survey work we've done, looking at the outcome of the survey, seeing what needs to be done there. Again, working with PG&E. Also looking at the demand response sort of opportunities with that.

Luminaire efficacy. Again, PG&E is doing a lot of that with linear fluorescents. We may want to look at other types of fixtures. Again, that would be more of a scoping thing. And the same with the regulation, looking at that for non-A lamps.

With that, I'm going to go to the technologies subject to preemption, which are the refrigeration items. So I'm going to turn this

over to Ramin. And I'll come back at the end for other items and a wrap-up.

MR. FARAMARZI: Good morning, Madam and Mister Commissioners. I'm going to follow the same structure that Randall is following with respect to the projects, past, present and the future projects that we have envisioned for primarily technologies that fall into the preemption areas.

And it happens to be that most of them are refrigeration-related. And since I'm overseeing the operation of the refrigeration and thermal test center at Southern California Edison, I have pretty much managed to come up with a list for this presentation today.

I would like to start by talking about the projects that we have completed, and we do believe that these projects would be subject to preemption. One of them is vending machines.

In the past four years, Southern California Edison has been working fairly intensively on the area of vending machines. We have about half-a-million vending machines in California estimated. And most of these machines are either used in indoor or outdoor applications.

Currently Title 20 does regulate vending machines, and the standards currently follows EnergyStar tier one levels. And as of July 1, 2007, EnergyStar tier two has become effective. And yet Title -- and also at the same time the DOE's federal standards is considering vending machines for inclusion in the upcoming standards. And they have not yet developed energy consumption data for it. And they anticipate to have this information, standards, also available as of 2012.

We have been working with the federal government to provide them with a lot of the research work that we have done in the past. And that has become basically the basis for some of their standard development activities.

We have looked at the closed front and glass front vending machines and both indoor and outdoor applications, and we have a lot of information on these projects that we have shared with the federal government.

The current projects that we have that are subject to preemption primarily fall into the display case, refrigerated display case area. And a little background about the refrigerated display cases.

Again, we worked very closely with the federal government and also their consultants to provide them with the research data that we had on open vertical display cases for most parts. And then some region display cases.

The federal government is planning to have standards that become effective as of 2012. And we have provided a lot of information to the feds and we think that the federal government is really on the right path to establish a fairly robust set of standards. And it's a fairly complicated area, and we think that we might not see feasible or advisable at this point for creating a set of standards in California before 2012. And just wait for the federal standards to become effective.

At this point, as part of our case study for display cases, we're trying to document everything that we have done with the federal government with respect to the research and past projects. And we have -- we are planning to include them in a case study report.

We're also working on a scoping project covering multizone heat pumps. And then some of the future projects that we're considering falls

into the wide category of the walk-ins.

A little background about the walk-ins. Edison worked closely with the American Council for an Energy Efficient Economy and ARI to draft a federal legislation which passed in December of 2007, that governed walk-ins, walk-in coolers and freezers, with less than 3000 square foot footprint.

As of 2008, federal government will establish standards, prescriptive standards, following essentially Title 20's footprints. And starting in 2012 then would switch over to performance-based standards which will include the energy consumption of walk-ins based on their sizes and all that in different climate zones. And they would have a size and source energy targets as of 2012.

However, we do think that from now till 2012, or at least 2011, California has a great opportunity to establish more stringent standards for the walk-ins beyond what the federal government has considered.

In my next slide -- I apologize for the slide, the fonts here -- what I've tried to do here is to give you a quick, at-a-glance overview

of how the California standards, here on the left-hand side column, compares to the proposed federal language for the walk-ins.

In a nutshell what is important is that in the area of lighting, California standards do not address lighting, and the federal government has set some minimum standards for lighting in walk-ins, both coolers and freezers. So here is an opportunity for us to work on the lighting.

The other area is infiltration barriers. Currently we do not have any requirements under our prescriptive regulations for walk-ins with respect to infiltration barriers. Infiltration barriers include any technologies, such as strip curtains, air curtains, or swinging-type doors that would prevent the infiltration of the warm and moist air adjacent to the cold environment of freezers and coolers.

And the federal government currently has strip curtains and spring-hinged doors as part of their minimum requirement for infiltration area.

Neither one of the standards, California nor the federal standards, do address defrost technologies. And this is another area that we wanted to talk about today.

With that said, we are planning to set a new project starting in this year that would look at the effectiveness of different infiltration barrier technologies, including strip curtains, spring-hinged doors, door gaskets and air curtains in walk-in coolers and freezers to quantify the demand that energy impact of these technologies under different weather conditions. So we're going to actually change the ambient conditions, and also assimilate or replicate the climatic zone variations in order to quantify the savings in the 16 climate zones that we have in California. Again, Title 20 currently does not address the infiltration barriers at all.

Another technology that we're interested in looking into is the use of variable speed evaporator fans for walk-ins when the cooling load of the walk-in freezers and coolers start reducing and the system, and the walk-in box or the refrigerator system for the box meets the thermostatic setpoints, typically the compressor shuts off.

At that point typically fans, evaporator fans continue operation. What we are proposing here to test in our test chambers is the testing

of a new technology that would actually, with the use of a proper algorithm, would look at the effects of reduction in the cooling load and accordingly reducing the speed of the fan so that we create some fan energy.

And when the system shuts off we operate at the lowest speed of the fan. And as the thermostatic setpoints, as the temperature inside the box goes above the setpoint we start speeding of the fan. And if, at the maximum speed of the fan we have not satisfied the cooling requirements, we will kick in the compressor to commence.

Defrost technologies. Right now many of the small walk-in freezers that we have in the State of California rely on electric defrost mechanisms. We would like to provide intelligence and information with respect to demand and energy impacts of switching over from electric to potentially hot gas defrost; and quantify that, again, for 16 climate zones in realistic operating conditions.

Also looking at termination methodologies. Currently many of the walk-in boxes used in food service and also in

supermarkets rely on timeclock time-initiative and time-terminated defrost mechanisms. We're interested in seeing if we can go to a temperature termination and quantify that and provide that intelligence to all the stakeholders in the process.

And in that process we are interested in looking at some of the newer emerging technologies that might impact defrost, such as advanced controllers.

And with the area of anode heat controls, almost all of the walk-in's solid doors, walk-in freezers and walk-in coolers are equipped with anodes with heater systems. So these anodes with heaters are like resistant heaters that are constantly providing heat to the perimeter of the doors. And they're on at all time to prevent the freeze-shut conditions of the doors.

Now, even if the humidity levels and the adjacent space to the freezer is pretty low, still these heaters are operating.

What we would like to address with this project is to test the performance of advanced controllers that are based on the humidity level in the space adjacent to the walk-in cooler and

walk-in freezer and see if we can quantify the energy and demand savings associated with operating such controllers, and provide that information for both medium- and low-temp applications to all the interested parties.

We are proposing to conduct a whitepaper study, so everything that I have said so far pretty much relying on actual scientific testings in our test chambers. This particular project, the construction of the walk-ins, with respect to moisture barriers and also the levels of insulation, we propose this project to be a whitepaper study. And kind of investigate the best practices for specifying and building and constructing walk-ins with respect to the selection of the panels and the moisture barriers, and the use of proper material for a more robust and tight operation of the walk-ins in general.

As I mentioned, currently Title 20 does not address any lighting-related requirements. And we would like to propose a project that looks at the efficacy of the type of fixtures that can be possibly applied to walk-in freezers and coolers and possible use of occupancy sensors.

And at some point, based on some metrics

that would be reasonable, we would like to see if we can have some kind of a lighting power density designator for walk-in spaces, depending on their sizes.

Another area that we have identified to be of interest to the industry based on our exposure to the industry is that currently there are not many simulation models out, simulation models available that would simulate or model the performance of the walk-ins.

And DOEII, currently, II.2, is supposed to model walk-ins in a reliable way. And many people have started using it in the industry. What we would like to do is benchmark the effectiveness of such design tools like -- or simulation tools like DOEII.2R by Ashley, replicating the conditions that we have in our lab into a model. And see if the model can predict the energy usage according to our test data.

Flooring selection is not addressed in the Title 20 language. And in the low-temp applications we would like to investigate that and modify the language in the current code with respect to requirements for floor insulation.

Floor insulation in low temperature

walk-ins has two purposes. One is the thermal resistance and reduction of the conductive heat transfer into the box. At the same time it prevents it from the ice heating that would ultimately damage the integrity of the floor and the walk-in construction. And this requirement is currently in the federal standards.

Other current projects that we're working on. Currently in the Title 20 we have a regulation that covers ice machines, but the spirit behind that regulation is pretty much based on the cube-type ice machines. We believe that nugget-type ice machines consume significantly less amount of energy than cube-type machines. However, the current standards does not address nugget-type ice machines.

And what we are actually conducting right now in our lab, we are conducting a project that we're looking at a common-type nugget-type ice machine. We would like to see the performance of this machine, quantify the performance of this machine under different operating conditions similar to what typically food service and also supermarkets are exposed to. And, again, model the -- not model, but quantify the savings for all

16 climate zones by using our test equipment.

We are also looking at the spot air conditioners. And this is the end of the refrigeration-related technologies that I had planned to cover. Again, most of the technologies that I mentioned are to be tested in our test chambers using our research equipment. And some of them are whitepaper studies.

And with that I can turn it over to Randall for some closing remarks.

MR. HIGA: Thanks, Ramin. I just wanted to run through a few of the projects that we have in mind and/or we're working on.

One is, you know, looking at elevators and escalators, currently they aren't regulated at all. So it's something that we may want to look at for the purpose of regulation. And there certainly are some other -- there are on the market, you know, regenerative sorts of systems that capture energy as elevators descend, et cetera. So there's opportunity for energy savings there.

Commercial electric dryers. That's something that we're going to tag onto the dryer project that you'll hear next from Sempra on the

gas side. VAV LEV fume hoods. This has been one of the favorite big energy savers out of Savings by Design, the new construction program. So we know that there's proven, cost effective technologies there. We just need to think about what we may want to do to include that in some sort of regulation.

Same with VAV kitchen exhaust. Hasn't been as popular, but again, systems are out there on the market that do meet code and are available; perhaps not yet cost effective, but something we want to look at.

Few other things. Fault detection diagnostic systems for HVAC package units.

ASSOCIATE MEMBER ROSENFELD: Hold on one second while you're at the slide on escalators and elevators. We've been thinking about something on escalators and elevators. In Europe and Japan a lot of escalators sense that there's nobody on them and turn off. And then are turned on by a personnel detector or a switch.

Have you been thinking about that?

MR. HIGA: We've certainly thought about that one. We're aware of that. Currently we have a third-party program in our energy efficiency

portfolio for escalators. And it's a control system where the escalators are always operating at a constant speed.

But because escalators are designed for 500 pounds on each tred, it requires a tremendous amount of power to run that.

And there's a control system that I'm not exactly clear on the technology, but it does reduce power when there is no load on the escalator. And there's apparently a fair amount of savings with that.

It's a relatively new program, so we're waiting to see what the outcome of that program is, an to see how that technology actually works in the marketplace.

But I think there's some promising things there, because it gets away from that issue of the concerns of escalators stopping and starting that some people have here in this country. And it overcomes that by having the escalator run all the time, but with a potentially lower energy use.

ASSOCIATE MEMBER ROSENFELD: I find that a little hard to understand, that is it's a -- thank goodness it's a property of an electric

motor that if it's unloaded it doesn't take much power anyway.

And certainly if you go to an escalator in Germany or Scandinavia or England, you know, most of the nonbusy time it's just off.

MR. HIGA: Right.

ASSOCIATE MEMBER ROSENFELD: So we ought to coordinate on that.

MR. HIGA: Yes.

ASSOCIATE MEMBER ROSENFELD: The other analogous question is elevators. I think that in Europe a lot of elevators regenerate, so the elevator which is going down powers the elevator which is going up. And have you thought about that?

MR. HIGA: Yes. One of the major manufacturers of elevators has introduced that or made that available. And they actually had a booth at GreenBuild in Chicago this year. So I spent some time talking with them about, you know, the potential for that.

I was very interested in the retrofit opportunities of that. They haven't really said that's available without replacing the whole drive system. But it certainly would be available in

new construction.

So, certainly that's sort of the idea where this item came from is that there's actually a manufacturer, you know, promoting this as a viable system.

ASSOCIATE MEMBER ROSENFELD: Well, I realize both you and I may be in the wrong workshop; that is this is really a Title 24 issue and not a Title 20 issue. Because it's new buildings.

MR. HIGA: Yes. It may be more of a Title 24 issue. And that's true.

PRESIDING MEMBER PFANNENSTIEL: Randall, I would like to go back to Commissioner Rosenfeld's question about the escalators, though. I'm afraid I didn't really understand your response.

Are you examining the potential for escalators that don't run when nobody's on them?

MR. HIGA: Okay, yeah, there is a case study that Sempra has been working on, --

PRESIDING MEMBER PFANNENSTIEL: Okay, so we'll hear about that --

MR. HIGA: -- and they'll talk about that when it's their turn next to do their

presentation.

MR. FARAMARZI: Also, Edison is actually, with respect to the third-party programs, in 2006 on their Idea Program, it's a third-party administered program, we have an escalator program which is looking at the very similar technology that's been discussed here.

And that is underway, actually, we started a project in 2006, and they're collecting data.

PRESIDING MEMBER PFANNENSTIEL: But that isn't the one that I think we were talking about. That's a no-load --

MR. HIGA: Right, that's the one -- and they claim that they cut the voltage down. And, again, I don't quite understand how that works according to their technology. But, yeah, so the on/off version or the strategy, that will be covered by Sempra.

PRESIDING MEMBER PFANNENSTIEL: Thanks.

ASSOCIATE MEMBER ROSENFELD: Let's see, I just woke up to one email that I got in the last month. There is a European community study on elevators and escalators. So, at lunchtime I should probably try to give you the email number

of Professor Almeda (phonetic) in Portugal, who's chair of that study.

MR. HIGA: Okay, great. We'd really appreciate that.

MR. FERNSTROM: Commissioners, this is Gary Fernstrom from PG&E. If I could add something. Our experience has been along the lines of your comment about motors not drawing very much power if they're lightly loaded.

Our experience has been that many of these energy-saving devices intended for that application have savings that are highly dependent on how you do the measurement.

ASSOCIATE MEMBER ROSENFELD: Okay.

MR. HIGA: And these are just a few more of the other things that we're working on. Just wanted to sort of give you an idea of the kinds of things we're thinking of.

And that's it for us right now. We appreciate the opportunity to make our presentation today, and we look forward to working with the Energy Commission, as well as industry, to, you know, move forward on these Title 20 activities.

And again, this afternoon we'll talk

more about the AB-1109 lighting topics. So, with that, thank you.

PRESIDING MEMBER PFANNENSTIEL: Questions? Tim.

MR. TUTT: Randall, Alex Chase mentioned that PG&E intends, or their team intends to provide the detailed case studies and/or templates by 1/30 for many of the concepts they brought forth in their presentation.

Are you on a similar timeframe, and do you have similar kind of concepts about prioritization of some of the issues you're looking at?

MR. HIGA: We haven't identified which topics we'll be submitting the case studies at this point. We're still evaluating that. We have some idea of those that have higher urgency, such as the refrigeration items, and the AB-1109 items. So we're going to have to internally prioritize, you know, which ones we do.

But we do intend to submit some in the near future. I don't know if it's exactly January 31st, but, you know, the idea is to get it in time for this rulemaking.

PRESIDING MEMBER PFANNENSTIEL: Further

questions?

Thank you, Randall.

MR. HIGA: Thank you.

PRESIDING MEMBER PFANNENSTIEL: I think, since it is noon, we're going to break now for lunch rather than trying to push on for a little while.

We will reconvene at 1:00.

(Whereupon, at 11:57 a.m., the Committee Workshop was adjourned, to reconvene at 1:00 p.m., this same day.)

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AFTERNOON SESSION

1:06 p.m.

PRESIDING MEMBER PFANNENSTIEL: We've got a full agenda; we're running a bit late from this morning. And I know there are a lot of people here who would like an opportunity to speak on this.

So why don't we move right along. I think we're now going to the Sempra, the SDG&E discussion.

MR. AHMED: Yes. Good afternoon, Commissioner Pfannenstiel, --

PRESIDING MEMBER PFANNENSTIEL: Good afternoon.

MR. AHMED: -- Commissioner Rosenfeld and CEC Staff and workshop attendees. Thank you for giving us an opportunity to present our proposals that we have.

MR. SPEAKER: Louder.

MR. AHMED: Is this better?

ASSOCIATE MEMBER ROSENFELD: Yes.

SPEAKERS: Much better.

ASSOCIATE MEMBER ROSENFELD: Maybe for everybody.

MR. AHMED: Okay. I know Gary Fernstrom and Randall Higa spoke a lot about the things that we do. A lot of it is collaborative, so that we harmonize a lot of the activities and avoid a lot of the duplication.

We are undertaking this case that is, a lot of it has also to do with the Title 24 standards, and some are with Title 20.

On the current efforts that we are looking at is standards that do not have any federal standards so that there is no risk of preemption. And we're looking at the test standards where there are no test standards, and establishing minimum performance standards.

We're looking at a commercial gas dryer that's going to be presented in detail; HMG is one of our consultants that's working on that.

Other appliances that we're looking at is the commercial radiant heater, the gas convection oven and we are also thinking about the burner flame controls, barbecues and vacu-heaters, and on air curtains. But some of those we have not finalized any due dates on those. The one that we have worked on in detail is the gas dryer.

Also, Randall had talked about the

escalators in the morning. We are looking at it from the Title 24 point of view. And we have in our fiat on that to work on escalators.

The major problem with escalators is the ASME code that does not allow escalators to be stopped or slowed down. So, I think one of the major focuses would be to get the code changed to come up with a new regulation.

And like I have seen in other parts of the world where escalators, if nobody's occupying it, it is always at a standstill. And the other are based on pressure sensitivity or occupant sensors and turns it on.

On the elevators, on the regenerative control of elevators, we are going to be talking to a manufacturer. We have set up an appointment towards the end of this month. They'll be presenting some data to us as to what potential there is.

Right now it's only for new construction. They don't have a product that addresses retrofits.

And under regenerative they also are talking about on these newer escalators with smaller size motors, they reduce the shift sizes,

because the belts can have a shorter radius so they can come up smaller motor sizes. So there is potential for demand savings, as well as energy savings.

Right now I'd like to turn it over to Jon McHugh who has worked on the gas dryer standard. And he's worked with Yonda Zang (phonetic), also from HMG. And I'll come back and if you have any questions, I'll take those after Jon.

MR. McHUGH: Thanks, Jerine. So first off what we're looking at is regulating commercial gas dryers. Currently the federal standards regulate residential clothes dryers. So we're looking at these commercial gas dryers, and there's a lot of them, in coin-operated laundries, in commercial laundromats, that sort of thing.

And DOE is looking at updating the residential clothes dryer, but right now they aren't making much progress so far.

And we're looking at around 16,000 commercial gas dryers in California. And if you think about the energy efficiency measures we have for the residential standards, those dryers are operated a lot fewer hours. So we're expecting

that the standards that will be developed for commercial gas dryers will be more stringent than the ones that we look at for residential type dryers.

And here are some of the issues that we'll be looking at. The combustion efficiency of the system. The controls. Many of you probably have on your own dryers a moisture sensor that rather than just setting a fixed time, there's essentially a humidity sensor in the drum that senses when your clothes are dry enough and turns off the dryer. So that's a fairly important technology.

The ability to efficiently control gas flow and have good combustion air mixture is important for the efficiency, as well as the flow in the residence time of the air in the drum, itself.

If we look at the energy savings potential associated with this, making use of the work that DOE has already done and reducing that to the commercial gas dryer market in California, we're looking at a annual savings of .3 million therms per year.

So, the step would involve developing a

test and list requirement so that the manufacturers are testing their equipment and consumers are able to compare between an okay efficiency with a high efficiency dryer.

And then also establish tier one performance standards which would be somewhat equivalent to the federal standards, which is based on a test method that looks at the amount of energy used to extract a certain amount of water out of the clothes.

And probably also look at some prescriptive measures, as well, such as the moisture sensors. That's something that you wouldn't capture in a test standard.

And in addition, the test and list also allows the utilities to offer efficiency programs, you know, incentive programs that are based on exceeding the tier one standard.

And that's my presentation on this. Are there any questions?

MR. TUTT: I guess I'd ask the same question that I asked earlier of Edison. PG&E had indicated that they were going to provide some case studies and/or templates by, I think, January 30th. Do you anticipate following a schedule like

that, or are you in a different timeframe?

MR. AHMED: We are on schedule to produce a template for the gas dryer. And we also going to work and see if there is some other areas that we might find and we might be able to come up with potential projects.

PRESIDING MEMBER PFANNENSTIEL: No other questions; thank you very much.

MR. AHMED: Thank you.

PRESIDING MEMBER PFANNENSTIEL: Moving on to NRDC, Noah Horowitz.

MR. HOROWITZ: Can someone give me a hand here? I'm our technology expert.

(Laughter.)

MR. HOROWITZ: Do I leave the WebEx? What do you want me to do on the WebEx icon?

(Pause.)

MR. HOROWITZ: Okay, great, thank you.

Good afternoon, I'm Noah Horowitz, I'm a senior scientist with the Natural Resources Defense Council, NRDC. We're an environmental advocacy group.

We've been very active over the last five years in taking a look at the consumer electronics area from an energy use and an energy

savings potential. And we've been very active in a lot of these conversations that have been with the industry, and I'm glad they're here in the room to discuss things like test methods, and testing standards.

And EnergyStar has some parallel processes, and we've been very active in those. And also in discussions with other regulators around the world who are looking at those same questions.

What I'm going to do this afternoon is kind of give you an overview. Alex did a great job and stole a little of my thunder, so I'll try not to be redundant. But I'm going to give a little more background.

While we do have some ideas on proposals, we haven't given a hard proposals today, but we're prepared to do that in the near future working with others.

One thing I'd add here, I don't know if everybody can read the slides, but standards readiness. If we had these discussions 18 months ago, test methods didn't exist. I'm delighted to say they do exist so we can measure apples-to-apples. Is anybody here from Apple so I can use

that term. They're all at the MacWorld show today.

Let's start with tvs. As Alex mentioned, we did some work a few years ago measuring the energy use of tvs and back of the envelope we're almost 5 percent of residential electricity use, and about 1 percent or more nationally overall energy use -- electricity use, rather.

And why is this? It used to be a 25-inch tv was a big tv. And in the kids' room was the 12-inch tv. Now that 25-inch tv is now the small one going into the den or one of the other bedrooms. And you might have a 40 or larger inch tv.

So, in general, these things scale with screen size, with the screen size with the exception of one of the technologies. TVs are on more hours per day, and that's because there's a lot more content due to cable and satellite tv. People are watching movies more at home.

Game consoles, which we talk about in general, are played on the tv. So you add that all up, that's driving the annual energy use for tvs. And also high definition tv, in some cases,

also increases the energy being consumed.

So what do we know? We've got some data, but I'm going to try and stick at order-of-magnitude numbers. A big screen tv will use between 150 and some of them now are topping out at more than 500 watts of power being consumed when they're on.

Round numbers, if you assume the tv is on five hours per day, and you crank that out, that's 365 to as much as 900 kilowatt hours per year. And Commissioner Rosenfeld like to talk in terms of how many ANWRs is that. I like to convert this to refrigerators. It's a ballpark 500 kWh per year is a fridge, and some of these tvs now are consuming as much energy per year as a new refrigerator.

There's also a large spread between the best and the worst models of similar size. So if we say 37-inch tvs, of a certain resolution, there's a big spread. And when there is a big spread that's often a potentially ripe place to set standards and eliminate the least efficient ones on the market.

There's a lot of mythology out there, but in general it is true that the plasma tvs of

similar size use considerably more power than the equivalent LCD tv. A huge caveat, though. The landscape is changing very rapidly. Maybe we'd be surprised 18 months from now that the best plasma may be using less power than the worst LCDs. And Panasonic and some other companies have made great claims that our plasma is going to be a lot better; please wait and see. So, I'm hoping they're right, but we don't know.

There's a lot of data here -- is there a pointer?

(Pause.)

MR. HOROWITZ: Can I talk over here and you still transcribe me?

PRESIDING MEMBER PFANNENSTIEL: I don't think so. I think you need to be at the mike.

MR. HOROWITZ: Okay. There's a lot of data here, but the conventional sizes now for big screen tvs, they're at some common breakpoints of 32 inches, 42 inches, and 50. And 47 is now a very popular size, as well.

And these orange dots which predominate the dataset, those are LCD, liquid crystal displays. The green squares are plasma. And these turquoise ones down here are rear-projection

or sometimes called DLP tvs. Those tend to be a little bit fatter, they're not a flat panel the way an LCD or plasma are.

Ignore all the different lines on here, but in general, the data follows a trend of power use on the Y axis, and screen area on the X axis. We think a future potential standard would be watts per square inch, or per square centimeter.

What's interesting to note is look at the huge spread. For tvs all along the same size, some of them use 500 and many of them are clustered around 200.

The EnergyStar spec that's likely to come out, first I had a straight line, and then for some reason, to people like us seemed somewhat random and arbitrary, they have a step function where they gave another originally 100 watts at this breakpoint for the 50 inch and larger. And they did that largely to make sure at least some of the plasmas would comply. There was a lot of pressure from the plasma industry that they wanted to make sure they had qualifying models for this voluntary standard.

So that's not for the discussion here, but some people are proposing, hey, let's do what

EnergyStar did. I think EnergyStar came close at the less-than-50-inch side, but they might have missed the mark over here. And we can talk more about this, and our templates will provide some more specificity.

So let's talk about policy stuff. In the past there was no way to measure the on-mode power use of tvs. The test method that was on the books at DOE was only for black-and-white tvs. We called this to the attention of the industry, and to their credit they agreed; they wanted to have an industry consensus test method that could be used around the world by all these manufacturers.

And lo and behold, they did come up with a test method that's in the process of being finalized through the IEC, is that right, Doug? Through an international standard setting body. It doesn't have the pedigree stamp, but everybody agrees it's final and it just has to go through the formal steps to make it an official standard.

So that uses moving clips, a series of different color clips. And you measure the on-mode power. And it does a very good job.

So manufacturers were asked to test their products, and some of that data came to

EnergyStar, and that's what you saw on the screen.

We don't have names and models, so is that the Sharp model X, 42 inch, that data isn't available in the public domain. We at NRDC had requested it, but for some reason that's not publicly available to date.

Another outcome from the federal energy bill is that the energy guide labeling program, the little yellow sticker that enables you to compare like models, will be on tvs. FTC was ordered to add tvs, computers, set-top boxes, monitors and one other device that escapes me.

And side discussions, we should all work together. If it's up to us to provide good input, what do we want that label to look like for these products. And they're ordered to do that in roughly 18 months timeframe. So some of that information will be available that's not currently available to consumers. And that's a good thing.

Title 20, as you all probably know, does regulate tvs right now. But it's just for standby power.

As Alex mentioned, the vast majority of the annual energy use is when a tv is on. So a tv may spend 18 to 20-something hours in standby,

it's only drawing 1 watt. During those five hours or so when you're on, you're multiplying by 200 or something, so that drives the annual energy use.

So we need to address active mode and current policies don't.

Some of the potential policy options that I'd like to put out here in terms of the spirit of brainstorming is would it make sense for California to do a test and list to gather that data if the other vehicles out there aren't sufficient.

We at NRDC agree completely with PG&E and I think some of the other people that will follow us, that it's time to add an on-mode power use element to the standards. And we think watts per square inch is the way to do that, to normalize for size.

At a minimum it's our belief you should remove the worst performing models from the market. We now have EnergyStar, there's no energy hog. We think those least performing models shouldn't be allowed to be sold in the market some time in the future.

A big debate that I don't want to get into now, I just want to flag it for people,

should this be performance neutral, so all tvs -- I'm sorry, technology neutral, so all tvs of a certain size, whether you're plasma and LCD, a DLP or some technology we don't even know yet, do you say here's the level, or do you say if you're plasma here's the bar for you. If you're an LCD, here's the bar.

EnergyStar went technology neutral and for that forum we thought that was the right thing to do.

I'd like to move to cable and satellite set-top boxes. Or should I see if we have any questions on tvs?

PRESIDING MEMBER PFANNENSTIEL: We want to keep going. We'll, at the end, ask questions.

MR. HOROWITZ: Okay, thank you. So, more than three out of four homes in the U.S., and my guess is California is similar, have subscription tvs. So they're either subscribing to cable or satellite; or increasingly in the future they might get their tv service from the phone company. The technical term there is IPTV, internet protocol television.

So I have a lot of data here. NRDC, with help from our consultant, ECOS, went into

roughly 50 homes to measure the power use of various set-top boxes.

So this first cluster of data here, that's your simple box, your subscribing to cable in this case. It's not high definition. It doesn't have what many people generically call tivo built in.

So the basic boxes are drawing between 10 and 20 watts when they're on. Most importantly is the yellow bars. So this is one model, this is another model, and here are their names. And we have the identifier separately. It gets too difficult.

But let's say this Motorola 1 here; there's at most a half a watt difference between when it's on and when it's in standby. Many of these boxes don't have an on/off switch. Or if they do, all it does is dim the clock or channel, the red LED. So these things are fully on, or the equivalent of that, 24 hours a day, even though the user is not watching tv many hours of the day.

Now we're moving to the world where many devices have high definition, provides a better picture, and there's a little bit of a power penalty associated with that.

Then we move to the far right, ignore that last data point, that's gone. But once you added a DVR, a digital video recorder, or, you know, a smart VCR, if you will, so you can automatically record all the Don Knotts shows or Monday Night Football without you having to input it, or you can stop live tv, rewind, and there's a lot of great functionality there.

These boxes have two and three tuners in some cases, or high definition. Many of them are pegging out between 30 and 40 watts. And increasingly, when you sign up for cable or satellite people are getting one or more of these boxes in their home. So we're moving from the world of people having this box on all their tvs to at least one of the tvs having this, and maybe this being in the other bedrooms. So that's the cable.

Satellite's roughly a similar picture, and again these are power numbers. And what's interesting to us is there's a pretty big spread amongst the best performing and the less well performing models here.

Same picture, though, in terms of if I'm not watching tv how does the power consumption

change. It virtually doesn't.

We are starting to see a positive sign. This is Sisco subsidiary, Scientific Atlanta, on the cable side; and I can't read on the satellite side. We are starting to see deltas of 5 or 7 watts, so they're spinning down the hard drive in the middle of the night, which makes it quieter. As well as saving energy. So the industry is starting to address this. They're starting to put in better power supplies. But, again, why should these devices be using so much power in the middle of the night.

To condense the data a little bit, a high definition receiver with a DVR, when you aggregate all those cable and satellite boxes, we're seeing roughly 40 watts when on, and a couple of watts lower in standby.

Many people like to think, okay, what does this mean in kilowatt hours per year. The boxes here that I think are where all the action is, we're seeing roughly 300 to 400 kilowatt hours per year for that single box that's sitting on top of the tv.

So we spoke about that tv, in some cases consuming 500 kWh per year. Now you're having a

large fraction of another tv just sitting on top of it.

So, where are we? Where do we think we could go here? I've mentioned a lot of this. To be fair, if you hit the standby button, it's unrealistic to think we're going to be a half watt or a watt. These boxes need to stay connected to what's called the head-end; the Time Warners and their Comcasts of the world who want to send an update to you, or update the channel guide or they need to verify that you're not stealing the signal.

So there needs to be some level of baseline activity. That doesn't need to be 40 watts, though. So what's the right number. That's the discussion that I think we should all be having in policy forums like this.

There's been very little progress, and personally I've been banging my head against the wall on this one, so the market dynamic is the following: In general the cable or your service provider, the cable or satellite company, they buy the boxes. And they provide it to you either for free or renting. They don't pay the electric bill. They haven't been very interested in this

issue.

The box makers say we can make a better box, but the service providers aren't asking. And we keep getting this sort of situation. So I think it's going to take some policy intervention to move this industry along faster than they'd like.

So some of the technical things that could be done to dramatically reduce the power use. These hard drives, in many cases, are spinning all night long. When you're not recording or playing back a show that makes no sense at all to us. At least one company, and a few others, are starting to provide that option to spin down the hard drive in the middle of the night.

We are seeing second and third tuners so you can watch one show and record another. But that's probably not happening very many times a day, if at all. But those second and third tuners are staying fully live, drawing power. Those should go to a lower power mode just to keep the tuner alive that's being used.

I think we're going to see in the next year or two a quick move to flash memory, which is

more energy efficient. You don't have the spinning moving parts. That could be incorporated into the box's flash memory. Still costs a fair amount today, but one could expect that price to decline rapidly.

I don't know if we do these through a standard, but so let's say I happen to love -- and I'm dating myself -- the Andy Griffith Show. And the box will say, hey, you asked to record the Andy Griffith Show all the time. I'm always going to be scanning for shows with Don Knotts in them.

Or if you watch Pittsburgh Steeler football games, they'll record all the shows ever set in Pittsburgh. The software does that, but as a result there's an energy penalty of it always recording these shows for you. You should be able to turn off that speculative recording feature.

On the satellite side of the world, pay tv is a big profit center for the service providers. Cable, you can hit a button and then you can automatically, you know, within a few seconds watch the show. Satellite can't do that, so what they do is they beam down the most popular movies to you at night, which causes your hard drive and your box to be working pretty hard.

Let's say you're the type of person that over a year has never watched a pay-per-view movie and don't intend to. How many boxes are being used at night drawing power to download movies you're never going to watch. So you should have the ability to turn that off, as well, we believe. These two things are not in any of the boxes that are currently being designed.

So what could Title 20 do? We think a mandatory standard is needed here, because the industry said, you know, we care about efficiency, we're working on it. We haven't seen the actions meet their words.

So we don't know what the right number is. We do agree the number needs to be something higher than the horizontal 1 watt standard that many people have been working on for standby. This is a different industry with special needs, and we want to make sure we meet those needs that make sense.

Should it be 5 watts or 10 watts? We don't know what the number is, but we think more discussion is needed here to set a maximum allowable standby level. So when you're not watching or recording a show or doing an update,

what's that baseline level of energy that's needed to keep the system ready. We'd be very interested to hear from the industry stakeholders on how low they can go, and what incremental cost, if any, there is to get there.

It's one thing for the box to only use let's say X watts, but will the box ever get there. So we think there needs to be an auto power down feature. Many of the peripherals hooked up to the tv the user doesn't hit the off button and it stays fully on all the time. So it's one thing to say yes, my box only uses 5 watts in standby, but we need to make sure it actually gets there.

The CEA led two working groups to create test methods and kudos to them. It was an open, transparent process, and they came out with some good test methods. The one place where they fell short is if I make a very efficient box those features only work depending on what's happening with the service provider.

So just for example point of view, if I have a box made by company X, if I test it on Time Warner I might get a very low power number. And they enabled this auto power down feature. But

Comcast could have turned that off. So we actually need to test the box with the live system. That provides some added wrinkles that I think we can fix, but the testing needs to be done on a live system, not just in a lab.

So that's game consoles. The third and last category I'd like to talk about are game consoles. We're still learning; we have less data here, but what we do know is pretty alarming. That's why I want to bring it up to you.

Think of three different modes, or a couple of different things. There are three manufacturers that dominate the game console industry, Microsoft with their X-Boxes, Nintendo which now makes the Wii, W-i-i, and Sony which makes different iterations of PlayStation.

So the X axis is power consumption and watts. And each, with the exception of Nintendo, which is kind of a different sort of animal, the Sony and Microsoft boxes, their power use is increased dramatically each generation of product they introduce.

So the X-Box that first came out in 2001 was around 60 watts when on. And now it's drawing 150 watts or so. Sony started out less than 20,

and now they're drawing close to 200 watts when on. This is somewhat out of control from our point of view.

So let's focus on the PlayStation-3. The top bar here, some of you may see this in black-and-white, that's on. So you've physically turned the device on, the game is loaded and you're playing the game. These are instantaneous measurements, you know, depending how hard you're flooring the driving game or something, the number may change a little bit. But for illustrative purposes that's how much power when it's on.

If you go away from the game, go to the bathroom or go for a snack or something, you're not playing the game, but it's loaded, it drops down a little bit. Where the industry has done a great job is if you physically hit the off button it's drawing less than 1 watt.

The problem is the vast majority of people, and we're trying to get some hard data to back this up, many people don't turn off their device for two different reasons. One, they're lazy or didn't think about it. Or another systemic problem is these games don't have the ability for you to save the game in the middle.

So you've been playing a game and some of these things you build to a higher level. And even if I wanted to turn it off I'm not going to turn it off because I don't want to lose my place in the game.

And these are very sophisticated companies. Microsoft, the developers or Window and Word, they automatically save all your Word documents and Excel and other things. We've engaged in some preliminary dialogue, how do we get this whole game industry to save the game. I think that's needed.

Microsoft is the only company that currently has a auto power down feature. So after six hours of inactivity, nobody's touching the shooter or the driving console, then it will automatically power down to 1 watt. Great solution. Is six hours the right number? We could quibble around the edges there.

The problem is that chip disabled. How many people are going to go in the menu, find the auto-off feature and turn it on. So that's the state of the art right now. Sony's current box does not have that capability.

The Nintendo Wii doesn't have the high-end graphics, and some of the other elements of

the Microsoft and Sony product, it's drawing much lower levels of power and we're trying to better understand how they can make their games use roughly 10 percent of what some of the others are.

These boxes go through cycles at roughly five-year increments, so I think the challenge is the next generation of boxes are being designed, how do we get ahead of that cycle and make sure these auto power down -- that these boxes really do go down to 1 watt at 2:00 in the morning when hopefully most of society is sleeping.

So what if the box is never turned off. If it's running 24/7, whether it's the Sony example or the Microsoft, order of magnitude you're using an extra 1000 kilowatt hours per year. That's two refrigerators you just brought into your house in terms of energy use and your electric bill simply by not turning off your game console. And we think we need to find a way to solve that.

That's roughly $100 a year or more in California with our higher rates and electricity costs. So after three years or so you've just paid as much to operate your game console as you did to buy it. Or the industry should take

advantage of that, buy my box and you could get the equivalent of two games for free. So there are lots of different ways to think about these numbers.

So I met with one of the manufacturers whose name doesn't need to be mentioned; a good conversation. So we said, let's say the best case scenario that somebody's playing the game for an hour a day, and when they're done they're good and they hit the on/off button. You're drawing about 70 kWh per year.

Let's say you've got the person who plays the game two hours a day and it stays in that idle mode, they never turn off their game. Now you're over 1200 kWh per year. So this is where I got that 1000 number.

if the device had six hours auto-off, it goes down to 400. Still a big number, but much better than that.

So here's just some back-of-the-envelope numbers to illustrate what a great opportunity this is for energy saving. So we want people to play the games, but not play games with the environment.

So what's our recommendation? We think

these boxes should be shipped with an auto power down feature enabled. And we can have a discussion about what's the right amount of time for that to kick in so it's not disrupting their gaming experience.

And then a standby limit, is 1 watt the right number? Probably for today's boxes. But as we'll probably hear from some of our colleagues from industry, some companies are hoping that this is the hub of the user's experience. It will be their DVD player over time and it will be hooked up to the network. And that has some power implications. We might need a slightly higher standby level. But that shouldn't stop us from being able to do this.

One way to do this is if you're finished playing with the game then having your box automatically power down shouldn't be disruptive to the user. And it should be relatively easy for the industry to figure out is the game over or not. There could be some sort of flag or the equivalent in software-ese. Maybe that's where we start.

We have learned that the game makers, the electronic arts of the world, they're the ones

that design the games and they have roughly full control of the console. So they need to be part of the solution and we need to include them in the dialogue.

They'll need to change how they write these games. That's not going to happen overnight. But maybe our long-term vision is the next generation of boxes and game consoles, the auto power down will kick in whether your game is over or not because it saved the game for you. It's smart enough to do that.

So I'm thinking we might have a two-tier process here. And we'd obviously need to provide more time to get to what I'm calling tier two. What's important, I think the CEC can drive this process and telegraph to the industry that they need to begin to work on this.

And we can do this in a way that's not even talking about on mode for now. That leaves them the most flexibility to design these boxes. It's getting that, you know, 15 to 23 hours a day that thing should be sleeping. And that's where the big energy savings potential is.

So, getting back to the high level. I would recommend the CEC host a workshop dedicated

to consumer electronics, and we should do that in the next couple of months to continue these discussions and figure out which of these technology categories the CEC has the appetite to set a standard for and to set a process for doing that in a sound way.

We're not the only ones -- California, that is, aren't the only ones thinking about these things. So let's stay in close touch with EnergyStar, who is setting or considering setting specs for these products.

The European Union has their own process called EUP, energy using products, where they are going to set mandatory energy efficiency standards for products. Some of the ones we went over here today.

The Australia Greenhouse Office and their analogs are looking at this very carefully, as well, so we can learn a lot from them, as well.

So that concludes my comments. And I really appreciate the opportunity.

PRESIDING MEMBER PFANNENSTIEL: Thank you, Noah. Are there questions here? Commissioner Rosenfeld.

ASSOCIATE MEMBER ROSENFELD: Noah, I

broke the rules this morning by raising Title 24 topics in a Title 20 workshop. Now I'm going to break the rules again.

But -- back to set-top boxes.

MR. HOROWITZ: Please.

ASSOCIATE MEMBER ROSENFELD: -- I think you had made the suggestion that if the manufacturer or the vendor had to pay the electricity bill, they would listen to you.

Has anybody talked with the Public Utilities Commission about a really high level solution which would involve your monthly rental including some proxy for the utility bills for your set-top box? This isn't a Title 20 issue, I understand, but it intrigues me.

MR. HOROWITZ: Yeah, there are different ways to go about this beyond an energy efficiency proceeding. Allen has come up with a provocative idea of make the service provider pay for the standby power at a minimum. That has some implementation challenges, but that could be a worthwhile discussion.

I'm blanking out for the term, but it used to be you would get an exclusive arrangement to be the service provider so the City of Oakland,

is it Time Warner or Comcast, and it's franchise agreements. Could energy efficiency be part of the franchise agreement.

The rules on how franchise agreements are set are changing, as well. That's an FCC issue. These are things we can talk offline, but I agree, there might be other avenues to have these discussions.

ASSOCIATE MEMBER ROSENFELD: Maybe at the end of this topic we could talk about that.

MR. HOROWITZ: Be glad to.

PRESIDING MEMBER PFANNENSTIEL: Tim.

MR. TUTT: Noah, I'm going to ask one more time, and I'll note as I'm asking that I realize in the workshop notice for this workshop we did request written comments and proposals by January 30th at 5:00 p.m.

So, are you preparing something along those lines?

MR. HOROWITZ: I was unaware of the January 30th requirement, but we'll get it in.

MR. TUTT: Okay.

MR. HOROWITZ: The only thing I might not have is some of the market data of how many set-top boxes are in California, but I'll make

some assumptions and we can update them.

MR. TUTT: One other question. Can you talk about how the set-top boxes you're discussing today relate to the high definition receiver standard we had last year, and what's happening federally with incentives for those.

MR. HOROWITZ: Okay, --

MR. TUTT: It seemed like we had a different standard than you're proposing, and it seemed like, as I remember, there's an auto power down feature in the federal --

MR. HOROWITZ: Yes, thanks, Tim. What Tim's talking about, for those of you who aren't aware, you will be soon. The federal government is shifting how we receive and broadcast tv. So as of February 2009, conveniently between the Super Bowl and the final four, our nation's converting to digital-only broadcasts.

What does that mean to the average consumer? If you're not subscribing to cable or satellite, and you have an analog tv or a CRT, thick tv, if you will, you will no longer be able to use that unless you buy what's called a DTA, a digital tv adapter.

Nationally the estimates are there might

be 25 to 30 million tvs that will stay in that situation. One of two things will happen. People have been drooling for the big screen tv, and this is the additional incentive, okay, I'll get rid of my tv; I don't know what a DTA is; and I've always wanted that thing, and the prices have come down.

We're going to see a spike in tv sales as a result. I neglected to mention that. So, next holiday season and fall I think we can expect a huge spike in tvs. And the question is, can we do anything to get ahead of that on the tv standard side. I don't know. If time permits, I'm hoping we could.

To really answer your question in this background, California set a standard that said those digital tv adapters, when they're on, it's 8 watts; and when it's in standby it can't use more than 1 watt.

There was an agreement, many stakeholders, including NRDC, the Consumer Electronics Association, the retailers and broadcasters all got together and said, hey, the real game here is let's make sure these things do go into standby,and when they're in standby they're not using too much power.

So, there's $40 per DTA rebate that's going to be provided. There's over a billion dollars in federal money that people can apply for these coupons. And it's not dependent on your income. And all those boxes will have used less than 2 watts in standby, and they have the auto power down. After four hours, if you don't hit the remote control, it will automatically go on standby.

So that policy exists. It's kind of a quasi-voluntary. As a result, California pulled its standard on DTAs because it appeared to be taken care of on the federal level. And Doug Johnson is here, and he might be able to talk to that later if I missed any of the fine points.

PRESIDING MEMBER PFANNENSTIEL: Noah, I was struck by the difference in power consumption of the game consoles. And, you know, some of the more popular ones use a fraction of what some of the others use.

And is it, for example, because Nintendo has specifically gone out of its way to be more efficient in their game consoles? Or is it totally a function of the kind of games that they're targeting?

I mean, they look, from my perspective they're sort of interchangeable, and I never quite know which is which. And then to see this enormous difference in energy consumption baffles me.

MR. HOROWITZ: Yes, we have those same questions. We're trying to better understand it. We're starting to reach out to these manufacturers, but in an over-simplified form, think of the Sony and Microsoft products as roughly having the same functionality, very high end gaming.

Where Nintendo, although it's a good experience, is not as high powered from a computing point of view.

This gentleman here --

MR. STRAIT: I have some experience in this area. I can probably provide a pretty comprehensive answer if --

PRESIDING MEMBER PFANNENSTIEL: Yes, please. I would appreciate that.

MR. STRAIT: All right. The one thing to understand about the modern --

MR. SPEAKER: Would you identify yourself for the record, please.

MR. STRAIT: Oh. My name is Peter Strait. I'm an employee here at the California Energy Commission. I happen to have done this as a hobby growing up, so I'm somewhat well versed here.

The major differences in the two high-energy consumption products, where the console game market is going is that these boxes are moving more and more into the computer realm. They're incorporating more and more functions of a full computer.

Microsoft, in particular, way back when Bill Gates was a big advocate of WebTv as an avenue to get Microsoft out of the office room, out of the computer room, and into the living room. And the X-Box grew out of that, and the X-Box 360 took that a step further where you have a fully internet-capable device that can do everything a computer can, and is very highly focused on the very demanding graphics applications.

The PlayStation-3, which is Sony's product, is moving in a similar direction to try to match those features.

Nintendo's product is not trying to

accomplish that. They aren't integrating the same computing features that Microsoft and Sony have. They're keeping more toward the traditional role of what they feel a videogame console should be, which is why their energy consumption has not increased very much.

So, if I can offer this: Probably if we're going to consider regulating any of these console systems we would probably want to align that with any regulation we do of computer products, because they are going to grow to be more and more similar over time.

PRESIDING MEMBER PFANNENSTIEL: Thank you very much; that did answer my question.

Any other questions here for Noah? Thanks

MR. HOROWITZ: Thank you.

ASSOCIATE MEMBER ROSENFELD: Noah, when I see you in the future I'll think of refrigerators.

MR. HOROWITZ: Okay.

(Laughter.)

MR. HOROWITZ: Here's copies I should have provided --

PRESIDING MEMBER PFANNENSTIEL: Now,

from 3M Company. Good afternoon.

MS. PEACOCK: Good afternoon; thank you very much for the opportunity to meet with you today. I do not have a presentation. I'm sort of a last-minute add to the agenda, but, again, very much appreciate the opportunity to speak.

My name is Tracey Peacock; I'm a Global Market Manager. I work in the optical systems division of 3M. So, 3M is a large, diversified manufacturer headquartered in balmy St. Paul, Minnesota. We manufacture over 60,000 different products.

And the area that I'm particularly focused in is optical film. So we manufacture optical film that's integrated into the back light of LCD technology, be it computers, monitor, hand-held, and specifically televisions.

So that's just a brief summary of our background, of 3M's background. And really the reason we're here today, the reason I'm here today is to provide a brief summary of a letter that we submitted from 3M Company to the California Energy Commission last week.

In that letter we asked the CEC to consider minimum standards for energy efficiency

for on-mode for televisions. And what I would like to cover today, I certainly don't want to be redundant. I think a lot of the key points that I came to talk about today have already been covered.

But I really just wanted to comment on a couple of points, provide a little bit of background as to why we see this opportunity, and talk specifically about sort of the technical feasibility of what we're proposing.

Our expertise as a company is definitely science and engineering. And certainly part of my interest in being here today is to make ourselves available as a technical resource. We participate throughout the LCD industry.

So, briefly, in terms of background, and I think, again, a lot of these comments have been covered, but when we look at the television industry it's over $25 billion in the U.S.; over 30 million units that were sold.

There was a report that was published by the Department of Energy in early 2007 that started talking about the increase in residential electrical consumption. And as part of their analysis they had pulled out an investigation of

some of the drivers behind that.

One of the areas they focused on was televisions. Depending on which report you'll read, they talk about an increase from 2005 to 2010 between 20 and 40 percent.

Now, when we received that Department of Energy report we started to investigate. And we really feel that there are really two primary shifts in the market. As has been commented on earlier, the transition from analog to digital signals in the U.S. is driving a lot of flat panel television adoption, both LCD and plasma.

In terms of -- there is that primary shift; and then the second shift, I would say, is a preference shift, again towards larger televisions. Historically we would have a 27-inch CRT. Now we're moving towards bigger televisions. That 27-inch television is being replaced by a 32-, 37-, 40-inch.

Another trend that was mentioned earlier, as well, is we have more televisions per household now.

But in defense of the televisions, in defense of televisions, there is actually a very dramatic shift in terms of behavior. And this,

too, has been commented on earlier, which is we are using televisions for many different applications than existed 20 years ago.

The average household right now has over 100 channels. Gaming, as mentioned, 40 percent penetration in the U.S. DVD, satellite tv. So this is, again, driving the fact that televisions are on longer. Nielsen Media Report put out a study the end of Q4-06 that talked about in an average household the television was on greater than eight hours.

And, again, when we looked at that data, we went back and looked at census data to validate this was true. So that's just background to simply say we see not only a preference, but a behavior shift.

Certainly a lot of what we cited in our letter to the CEC is based on the EPA. 3M has a very long-standing relationship working with EnergyStar. And our recommendation to the CEC was to consider the EnergyStar specification for televisions as a starting point in terms of looking at minimum standards.

So, as part of that, I won't go through a lot of the details. I think earlier

presentations commented on increasing power consumption and what the potential benefit is in terms of energy savings.

When we talk about energy efficient televisions, though, I would just make the comment that it's not only plug power, but a point that we also think is relevant is reduced thermal load. Energy efficient televisions typically generate less heat.

Now, again, not necessarily relevant in St. Paul where it's 18 Fahrenheit right now, but in areas where there is air conditioning we think that that's another benefit of having an energy efficient television.

A key point, though, and we recognize this, is the cost/benefit analysis. And, again, our investigation shows that there are positive factors that are enabling the industry to meet energy efficient targets. These are improvements in panel transmission; these are improvements in bulb technology. We are certainly not the only manufacturer that has developed technology that improves the energy efficiency of televisions.

But in parallel we also see factors that will negatively impact energy efficiency. And

again, these have been commented on earlier. The trend towards larger televisions; the trend towards higher resolution.

So our real interest is, also, again just to reinforce this point, that we would like to be involved in the dialogue as the CEC considers this going forward. We feel a lot of our technical expertise is something that would be of value as well, to complement the data that you would already be generating.

So, in conclusion, as I said, I didn't want to reiterate a lot of points that have already been made, but I would simply ask that if the CEC does consider initiating rulemaking on televisions, that they consider 3M as a potential resource to you going forward.

PRESIDING MEMBER PFANNENSTIEL: Thank you very much, Tracey. Are there questions? Thank you for presenting this to us. I think it's an important area for us to consider.

Now, public comment. Anybody here have comments on the information provided so far, before we get into specifically the lighting, the battery chargers, if anybody would like to make a comment, please come up to the mike up in the

front so we can record that.

Seeing none, why don't we move into the lighting efficiency part, then, of the discussion.

Let's start with Alex Chase and Chris Calwell.

MR. SPEAKER: Jackie, I need to call Chris to make sure he's on.

PRESIDING MEMBER PFANNENSTIEL: Okay, sure. Alex, do you want to --

MR. CALWELL: This is Chris Calwell's office in Durango here. We have him on email. He'll be signing on in just a moment.

PRESIDING MEMBER PFANNENSTIEL: All right, thank you very much.

MR. EILERT: Commissioner, may I ask a question while we're waiting?

PRESIDING MEMBER PFANNENSTIEL: Of course, Pat. Is your mike on, Pat? Make sure that the green light is -- has to be illuminated.

MR. EILERT: Fine. So earlier, at the beginning of this meeting, Harinder had a --

ASSOCIATE MEMBER ROSENFELD: Tell us who you are.

PRESIDING MEMBER PFANNENSTIEL: Yeah, get your name in the record, please.

MR. EILERT: I'm Pat Eilert, PG&E. There was a slide that showed a 2011 effective date for lighting. Was that only for incandescent, general service lamps, or was that an expectation for all the lighting measures?

MR. TUTT: If I remember that slide right, Pat, that would be for general service lights.

MR. EILERT: Okay, thanks.

MR. POPE: This is Ted Pope with Energy Solutions for PG&E. I talked to Chris; he was going to be on momentarily.

PRESIDING MEMBER PFANNENSTIEL: All right, that's fine. We'll wait for him, Ted.

(Pause.)

MR. FERNSTROM: This is Gary Fernstrom from PG&E. While we're waiting it seems to me there might be a good opportunity for synergy between some of these digital set-top boxes and tropical fish tanks.

You could put your fish tank on top of the set-top box and then you wouldn't need to heat the water in the tank.

(Laughter.)

PRESIDING MEMBER PFANNENSTIEL: Yeah,

but that only improves the efficiency. All the fish will die.

(Laughter.)

PRESIDING MEMBER PFANNENSTIEL: And we'll get blamed for it.

(Pause.)

PRESIDING MEMBER PFANNENSTIEL: We're just going to go off the record until we get Chris on.

(Off the record.)

PRESIDING MEMBER PFANNENSTIEL: I think we're complete and can be back on the record. Chris, you're here. Ted, do you want to coordinate this?

MR. POPE: I'll go ahead and drive and Chris is just going to help me change slides.

PRESIDING MEMBER PFANNENSTIEL: Okay, Chris.

MR. CALWELL: Very good. Thank you, Commissioners. This is Chris Calwell from ECOS Consulting. And I wanted to present today on behalf of PG&E about some of what we've learned from analyzing the federal energy bills, and also the Huffman requirement in California.

Could anyone let me know, is this okay

for volume?

ASSOCIATE MEMBER ROSENFELD: It's just fine.

MR. CALWELL: Okay, thank you, Commissioner. So, this is the second slide, Ted. The key topics I want to run through today are shown here. And we'll talk a little bit about any enforcement issues we've observed to the existing standards, devote a significant amount of time to consideration of the recently adopted federal standards.

I'm going to be looking at the Huffman bill requirements of California; not all of them, but just the indoor residential provisions for a 50 percent reduction.

And then talk a little bit about recent market research findings, primarily for DSL; and lastly, some brief recommendations to the Commission.

And I've been instructed to talk for about 20 to 25 minutes; does that still match with the agenda for the day?

PRESIDING MEMBER PFANNENSTIEL: Yeah, I think that-- we still have a bit to cover, so -- but, go ahead, let's --

MR. CALWELL: I'll stay --

ASSOCIATE MEMBER ROSENFELD: There's a lot of meat in your slides, Chris, we recognize that.

MR. CALWELL: Okay, I'll stay as close to 20 minutes as I can. And if there's time for questions let me know, when you need to cut it off, just let me know.

Okay, thanks. Next slide, Ted.

So, regarding the enforcement issue, we had a huge staff, including Ted, himself, that paid visits to retail stores recently in California to see what we've seen on shelf development.

And most incandescent bulbs on the shelf in California today do not meet the tier two standards that took effect January 1, '08. However, we know that the standards are based on date of manufacture rather than date of sales. And so there may be changes imminent in what's stocked. But right now you wouldn't notice a major difference as a result of the standards in what's for sale.

In some cases, interestingly enough, we had major national chain retailers that were still

selling bulbs that don't meet the tier one standards. And that concerns us more, because those standards took effect two years ago.

So, Ted may be able to provide specifics to you, but in total we visited Home Depot, Target, Lowe's, and a few grocery store chains. And the photo you see here is from one of those visits.

Probably the main thing you notice is CFLs have definitely risen in the amount of shelf space devoted to them, which is great. Of the remaining shelf space, it's split about 50/50 between modified spectrum products and standard products. And, of course, it varies from store to store.

We didn't see marketing materials to explain the new wattages and help people navigate the tier two. So well be interested to observe that over the next few months, since I think a lot of consumers will be surprised when the 100, 75,a 60s and 40s go away, and are being replaced by bulbs that are 5 percent lower in wattage.

Next slide. Regarding the federal standards, as I said I won't speak to all of them. In particular at the bottom there you can see a

reference to incandescent reflector and metal halide standards. Those are sort of the purview of other experts.

I wanted to speak primarily about the general service provision. And here you see a summary of some of the key provisions addressed by the standards. A tier one requirement federally will be facing between 2012 and 2014. Tier two would take effect after 2020, which is far-reaching nationally, but it's too late to affect the Huffman deadline in California.

The (inaudible) exempted from the standards or subject to later time -- by DOE if the sales double, include various things like three-way lamps and rough -- vibration service type lamps.

Modified spectrum lamps were given significantly less stringent standards and did not have the DOE-imposed sales limit. I'll talk a little bit more about that later.

And there's broad preemption of action by states other than implementing the federal standards early and acting if DOE doesn't on the tier two. And there's, of course, changes to FTC labeling that are encouraged, as well.

Next slide. Here you see on an efficiency versus light output basis the -- I apologize for the age of the slide. It says U.S. Energy Bill, and of course now it should say EISA, since it was adopted.

But here you see the lumen and wattage being expressed on an efficiency basis. And they rise as the light output increases. Then they drop suddenly again to the next bin. And then rise, drop, rise, so they give you kind of a sawtooth image when you plot it this way.

We've also plotted on the same chart the proposed standards in Canada, which are undergoing final decisionmaking now, just to see the relative stringency of each, and which parts of the curve, one is more stringent than the other.

The tier two federal requirements are shown as 45 lumens per watt, straight line. And, of course, DOE has the ability to modify that. But that's the max'd out provision in the law.

The next slide shows the exact same information, but we have plotted it on a watts-versus-lumen basis. And what you can conclude from this is that for lamps that are brighter than today's typical 40, 60, 75 and 100 watt bulb,for

lamps that are brighter, the U.S. requirements are more stringent than the Canadian requirements. But for lamps that are dimmer than today's bulbs, the U.S. standards are less stringent than the Canadian requirements.

And so it'll finally settle out depends on what the manufacturers do. See again the tier two requirement as the much more stringent version of the tier one in Canada, and a straight line on an efficiency basis.

Next slide illustrates the treatment of modified spectrum lamps by the U.S. law and the Canadian Law. And here the situation is somewhat different. You can see that the Canadian line is more stringent than the U.S. across most of the range. And with very limited exceptions, unless the lamps are significantly brighter than today's, the Canadian model would be more stringent than the U.S. one, and require greater improvements in efficiency.

One more slide. You can see the same relationship again, but (inaudible) versus limits. And so I think the rationale in Canada was to look at the lamps that are currently the least efficient, and apply the greatest percentage

improvement to their efficiency.

Whereas in the U.S. case the same difference that you see in efficiency today between modified spectrum and standard incandescents, was essentially preserved in future regulation.

Okay, let's go on to the next slide. Ted, are we on the one that says, what will the new standards bring?

MR. POPE: Yes, we are.

MR. CALWELL: Okay, thanks. So, this is a very difficult question to answer. We don't know exactly what's going to happen to the market as a result of all these standards.

So, I've just highlighted a few general observations. I'll show you the result of a model exercise we did with PG&E.

I think, at its best, the new federal lighting requirements would, of course, lead to the introduction of new bulbs that would have different and lower wattages than today's. And some consumers will definitely shift to those lower incandescent wattages. Many will buy CFLs instead.

At the price difference they've been introduced at, of course, the CFL is less

expensive than the first generation of significantly more efficient incandescents, the Halogena from Philip. So that'll likely create differentials in CFL.

At the worst, or if the standards do not deliver all that they're promised, what could happen One scenario is that manufacturers would shift their current general service -- business wholly or mostly to modified spectrum lamps that are dimmer, less efficient and longer lasting than the standard bulbs they sell today.

And of course, they would be less expensive than the efficient products their competitors are offering. At the same time, because Three-Way vibration service, their niche folks are not immediately regulated. Some consumers may buy those to keep getting the similar lamp types and prices they're used to until DOE regulates for increasing sales.

So, do I think that either of these two extremes is definitely what's going to happen? No. As you can see on the next slide, of course, the most outcome is somewhere in the middle. But it's instructive as we look at scenarios for the Huffman Bill to consider what would happen if most

of the loopholes are exploited, and what would happen if very few of the loopholes were exploited.

So, most likely outcome, CSL sales will continue to rise; LED will start gaining market share, as well, beginning with the lowest lumen product. And I've shown some of those examples at a previous CEC hearing; they seem most likely to replace the 25 and 40 watt incandescent first, and then gradually migrate up to brighter factors.

The modified spectrum lamps will sell in larger numbers than conventional incandescents and continue to be dimmer in the most likely scenario, I think, because they don't have as much regulatory pressure to improve their efficiency.

And a large fraction of incandescent buyers will switch to the wattage bin immediately below or above the one where they currently buy, rather than the one recommended by the wording on the package. I say large fraction; how large of a fraction, we don't know. And I think it depends on how effective the marketing is in the store, how well educated the retail staff are in steering people to the best choices, and what sorts of labeling the MTC goes for in their rulemaking.

So, the next slide indicates wattage plateaus versus purchase decisions. And I just wanted to illustrate the point I just made, to give folks in the room an example.

So, what you see here are the federal requirements for general service lamps. Those are the four red plateaus that are shown on the graph. And then there's some dotted blue plateaus extending to the left. Those are the modified spectrum ranges. And you see that the wattages are the same for the general service, but they're extended quite a bit to the left in light output. And in some cases they overlap, which we try to show on the graph, as well.

Now, take a look at the two light bulbs. One of them is a fairly conventional 840 lumen soft light 60 watt bulb. And one of them is a 630 lumen conventional modified spectrum bulb.

So the first question to answer is what would a manufacturer do to change the design of each of those. So, Ted, if you can advance the slide one click, what we've shown here are three possible design changes. The first one going straight down is essentially saying what if they improve the efficiency of that bulb and made no

sacrifice in light output.

So naturally lumens stay the same; wattage drops by a little more than 25 percent; and you get a fairly ideal outcome.

The second scenario that might occur is the manufacturer would migrate to the lowest light output level the standard allowed for a conventional lamp, and you can see that middle arrow around 750 lumens.

And then the third scenario is they decide to not sell the conventional lamp anymore, but to go for a modified spectrum instead. In which case the standard would allow the light output to drop all the way back to about 550 lumens, which still is the same allowed wattage.

So, go ahead and advance that slide, Ted. Those are the manufacturer options. Let's look at what's the consumer decision in the store when faced with new alternatives. And here we see three green arrows.

So starting with the one at the lower left, the thing we all want to happen from these standards, of course, is that the consumer goes to a 43 watt lamp and purchases it instead of a 60. And that 43 watt lamp may be a little dimmer or

similar brightness; and it could even be a little brighter. We don't know. But it would be 43 watts.

The second outcome which I think we have to acknowledge is fairly likely is that the consumer looks for the new wattage that's closest to the wattage they used to buy. In that case it's a 53, or thereabouts. And that's shown by the middle green arrow. And it's not unlikely that the average consumer would choose the wattage closest to what they're used to buying unless they have a rally good reason to do otherwise, like prominent packaging, educated sales staff, prominent marketing materials in the store or other guidance.

And then, of course, the last option is that they might choose the next wattage level above the one they're used to buying, which is shown by the upper right green arrow.

I can't predict -- I don't think any of us can predict how many consumers will do each of these three things. But if we know they're all possible, we can work together on effective communication strategies to reduce the chances of them buying a higher wattage than is needed for

the amount of light output they want.

The next slide is a table illustrating some of this. And I won't bore you with all the details, you can look at it more closely after the presentation. But let me just, for simplicity's sake, let's just pick the column that says 60 watt bulbs. And then you don't have to watch as many numbers.

So, 60 watt bulbs today, the federally allowed standards wattage is 43. The wattage savings is 17 watts. And therefore the percentage savings is 28 percent, which is great. If that happens that's a big success for federal policy.

And you notice in the next column I calculate the efficiency change. And if light output stays the same, and wattage drops by 28.3 percent, then efficiency goes up by 39.5 percent.

What happens if the bulb is dimmed to the maximum extent that the standard allows. Well, we get a 10.7 percent reduction in light output. But now the efficiency gain is down to 24.3 percent. Still a success, but not as much savings as the 39.5 percent we thought we were getting.

What happens if the manufacturer uses

the full amount of dimming allowed by the modified spectrum provision. That's another 33 percent drop in light output. And now we're actually, you see in the final row, that our efficiency has actually dropped by 6.6 percent from the lamp we have today.

So this is what I mean by mapping the loopholes of the standards. And it's why it's so very important that marketing and consumer education and incentive be directed to encourage light output to stay the same rather than products to be sold at lower levels while the wattage is dropping.

Next slide. Want to get into the modeling discussion now. Which factors are driving up residential lighting energy use. I've listed a few here. There are undoubtedly others. And since we've talked about most of these before in Commission meetings, I don't want to focus on them, other than one of them.

The second-to-the-last bullet, Title 24 standards discourage use of CFL. I was at a recent meeting of the California utilities where many of the participants were complaining that the most recent Title 24 revisions had encouraged the

use of dimmers in new construction, which is generally an energy-saving measure.

Unfortunately, most CFLs don't work well with dimmers. And so it was the belief of the people in the room that that Title 24 revision was actually costing more energy than it was saving because you might get a small percentage benefit from installing dimmers on incandescent lamps, but it's dwarfed by the savings you could have gotten from CFLs if they were easier to put in.

So, my encouragement would be to the Commission for the next round of Title 24 to take note of that and look for a change that uses controls where incandescent lamps are required, but otherwise encourages the maximum use of CFLs.

Next slide. Which factors are reducing residential lighting energy use. And fortunately, there are a few pieces of good news here, as well. There's the (inaudible) increasing availability of CFLs, the testing programs that have been running with utility funding for awhile in the U.S. have, I think, actually improved the quality of CFLs. And generally given people more confidence that a labeled CFL will perform well.

There's an increasing prevalence of

EnergyStar fixtures in new construction. The energy prices has probably encouraged a lot of standard conservation behavior like shutting off lights in unoccupied rooms. And then the controls are certainly an energy saver for incandescent situations. And, of course, we have Title 20 requirements tier one and tier two now in effect.

Okay, now come the scenarios for modeling, and then the quantitative results of our work. And here I wanted to especially thank the staff at CLTC, whom many of you know, because the modeling exercises are incredibly difficult to do, and they're filled with many assumptions.

So they also took a crack at this, and we compared models and tried to see which assumptions were reasonable. And so as the Huffman response goes forward I think more of this modeling should be done by more parties. And we should all try to arrive at some consensus assumptions regarding what will happen in particular aspects of the California economy.

So, how will residential lighting energy use change by 2018 from the federal standards alone if the CEC takes no further action? And this is what I labeled as the low efficiency

scenario.

Well, the first and best news, of course, is that average lamp wattage would drop by about 24 percent. And the assumptions behind that are that there are some continued increases in sales of unregulated lamp types; that standards enforcement around the existing tier one and tier two standards is not as thorough as everyone would like; that most of the new incandescent products that have come out are introduced at the dim end of the allowable bins, as I showed before.

Modified spectrum sales continue to rise. Number of consumers would jump up a bin to get enough light or would at least go to that intermediate bin I showed you.

On top of this I assume CFL's socket share would rise to 25 percent. And we think it's about 15 percent in California right now. So, what do I mean by socket share? That's percentage of stock, rather than percentage of sales. So, in other words, 15 percent of residential sockets are occupied by CFLs. That number is higher in California than in the nation, as a whole, of course.

But we tried to assume further

increases, and in this case of 25 percent, and that LED technology, which is fairly noticeable in residential today, might gain a 5 percent socket share by 2018.

So, if you make all those assumptions the model says that average lighting energy use per household would drop about 9 to 19 percent, depending on changes in average hours of operation. And the 14 percent expected growth in the number of households in California between now and then would be just about large enough to wipe out those gains.

And so in a pessimistic scenario we show roughly constant total residential lighting energy consumption between now and 2018, even with the adoption of the federal standards.

Now, let's look at an efficient scenario which I'm kind of considering as the middle case. And I won't go through all these assumptions in as much detail as I did before, but just the highlights are that average lamp wattage goes down by 41 percent.

We take CFL socket share all the way up to 40 percent, which would be remarkably high. And LED efficiency continues to improve; their

socket share reaching 15 percent. And the big picture finding for Huffman compliance is in this scenario we could get to a 28 to 38 percent drop in lighting energy use per household, depending again, on what's done with hours of operation and control of the Title 24. And on an overall basis you get a reduction of about 24 percent.

So that's encouraging for helping to meet the state's AB-32 climate requirement, but of course it's not enough to comply with Huffman.

So we ran one more scenario -- next slide, Ted -- which is what would be possible in a best case scenario. And I want to emphasize that this one is highly unlikely because so many things would have to go right, and so much government policy action would be needed immediately to get there.

In this best case scenario we see a drop in average lamp wattage of a full 57 percent. That's unprecedented, by the way. There's no record of a state having ever achieved anything like that before in the U.S.

But if California could, there'd be virtually no sales of unregulated lamps; there would be aggressive enforcement of existing and

newly adopted standards. Nearly all new incandescents introduced would actually improve efficiency with no loss of light output. And they'd cut power an additional 10 percent after 2014.

Let me emphasize there that the standards don't require them to do so, so this would be manufacturers moving beyond the federal requirements because they've been encouraged to do it, after 2014. Modified spectrum lamp sales would not increase from today's levels. There'd be zero bin jumping, so consumers would only buy the lamps that deliver the same light output as today's lamps at lower wattage.

CFLs would run all the way to 45 percent socket share and get even more efficient than today. LEDs would grab most of the rest of the socket share, and they'd be 50 percent less power consumptive than the forecasts we already made for 2018.

And so you'd see the CFLs and LEDs would be two-thirds of all the sockets. And if that happened we can see average energy use per household dropping about 50 to 54 percent, which is just barely complying with the Huffman bill on

a per-household basis. And, of course, on a statewide total basis, it would be 43 to 48 percent. So not quite a half.

Okay, let's turn to some brief market research pieces, and then I'll wrap up. So, this is a slide you all have seen before. Marcie Sanders (phonetic) showed it when she came down to the Commission last fall -- I'm sorry, last summer.

And it's just an illustration of what one region can do to encourage greater CFL share with a very deliberate market transformation program. So, while the national market share for CFLs was ranging between zero and about 5 percent, the northwest market share ranged upward to 16 percent, back down in the teens, and then back up again to over 30 percent in late 2006.

This was a radical success for a region to achieve. And what we've found more recently in some other data to show what's possible nationally with these kinds of larger programs. So, this is the data you've seen before from the northwest.

The next slide is some brand new information that was just released in a very general form by a company called Esource. I've

listed the source at the bottom there, Bill LeBlanc, if you have questions about it.

And they were able to do a survey of 115,000 customers in early 2007. And they found a national average of 3.4 CFLs per household. This is not purchases, this is installed, or what we call socket share.

So interestingly enough, the regional variation was pretty high. In the southeast and midwestern states the number was typically less than three. California had 4.6, which is great news and a testament to the success of utility programs.

But Vermont, which runs probably the most intensive utility efficiency programs in the country, had an average of more than six. And perhaps most interestingly to me, half of all the households they surveyed had no CFLs at all. So what does that mean? The households that do have CFLs would have to have six or seven each in order for the averages to work out.

And so the implication of that to me is that marketing has done a better job motivating current users to buy more CFLs than it has encouraged new users to try them.

And that may suggest some strategies for the Commission and the utilities to think about as they try to gain further lighting energy savings. Namely, you've got to find a reason and a way for the people who are not persuaded to try CFLs for the first time.

CFL purchase rates rise with age and income. And men are more likely to purchase them than women, according to the Esource data.

They also asked people why they bought CFLs, and interestingly enough the long life and the financial savings on energy and buying more bulbs was definitely a larger motivator than environmental benefits and utility rebates.

I think the utility rebates, as a small motivator, is a fairly recent phenomenon, and it has to do with just how inexpensive CFLs have gotten. Even where I live in a small town in Colorado CFLs are routinely available for $2 apiece or less with no utility rebate. So, it's not clear that utility giving me 50 cents or a dollar would make much difference in my desire to purchase them. That's probably true in much of the country now.

Let's take a look at the next chart.

This is brand new information that our team spent a considerable amount of time in analyzing in the last month or two. The U.S. Department of Commerce gathers trade statistics monthly on product imports into the U.S.

And so what you see here are monthly import levels on a units basis of CFLs from January of 2000 through November of 2007. So I want to emphasize the 2007 totals that appear at the bottom are not quite complete, because we don't have December data yet. But with December data we believe the 2007 number will exceed 400 million units.

And what does that mean? It means that in 2007 alone more screw-based CFLs were sold in the U.S. than in 2004, 2005 and 2006 combined. So it's a remarkable accomplishment. It bodes well for California's effort to comply with Huffman. But sustaining levels of purchase that high and increasing them is going to be our collective challenge in the years to come.

The next slide finishes up the discussion of CFL market data. And let me just walk through this very quickly. In 2007 CFLs were about one-third of screw-based bulbs imported into

the U.S. That's amazing. And something I don't think any of us thought we would ever see when we started working on this subject 20 years ago.

What's the share that CFLs represent of total unit sales of screw-based bulbs? That's a harder number to estimate because so many general service incandescents are still manufactured in the U.S. But, roughly speaking, our model shows that around 25 percent. And then you see a Wall Street Journal graphic over here with data originating from NEMA that also seems to suggest a fairly similar number.

And you can tell by looking at the 2007 bars that the CFL total is in the range of a quarter to a fifth the size of the incandescent bar. And most importantly, incandescent sales have been dropping steadily since 1999. And are dropping more and more rapidly with each passing year.

One other interesting finding from an EnergyStar analysis that was done in early '07, California was 9.6 percent of the EnergyStar CFLs sold by six major retailers in early '07. And that's a little bit surprising because as all of you know California's more than 9.6 percent of the

U.S. population. And has been a very steady and well-funded proponent of CFLs.

So for California to have sold slightly less than its per capita share means probably that a lot of other regions are starting to catch up with California, and also put major resources into CFL promotion.

We think that national socket share of CFLs by early '07 was around 10 percent. That's the implication of the Esource data. And we think that California's socket share is closer to 15 percent, which is the basis for the modeling information I gave you before.

So to conclude the recommendation slide, these are, I don't think, a big surprise and they are themes that I've touched on before. But just quickly, first and most importantly, we urge the Commission to enhance its enforcement of existing Title 20 standards.

Second, lead to pursue Title 20 standards for the residential lamp and fixture types that weren't already preempted by the federal standards. And I think the other members of the PG&E team may have already touched on some of those earlier today.

We'd like to encourage California to accelerate its adoption of the federal standards as soon as the law allows. That's, I believe, the one-year acceleration clause that's in there. Use your Title 20 standards to require greater use of efficient fixtures. And as I mentioned before, avoid penalizing use of CFLs.

I think the state should also consider financial disincentives on the continued sale of inefficient incandescents. There's nothing about federal standards that preempt the state from assessing a charge on the sale of inefficient bulbs or using the money collected from such a charge to further encourage the sale of efficient ones. It's an old idea of fee-bates that's been applied to cars and buildings and other things like that. It could just as easily be applied to product.

And then lastly to consider some strong financial incentives for what Michael Siminovitch and others have called super CFLs and for best-in-class LED products.

With that I'll conclude and would be happy to take questions as time permits. Thank you.

PRESIDING MEMBER PFANNENSTIEL: Thank you, Chris. Questions? Tim.

MR. TUTT: Chris, I just have one question related to modified spectrum lamps under the new federal standards. As you know, in our current Title 20 standards we exempted them. The federal standards did not do that.

And as I understand it, the modified spectrum lamps are capped at the same wattages as regular lamps and would therefore have to presumably use the same changes in technology as regular lamps, regular incandescent.

So, I'm curious as to why under that scenario people would move towards modified spectrum lamps any more than they are today.

MR. CALWELL: That's a good question. The 25 percent allowance that was granted to the modified spectrum lamps federally is larger than some of the technologies need. There are different ways of approaching modified spectrum, and they don't all require 25 percent less light output.

So the manufacturers who choose to use the more efficient means of modifying spectrum would have more room to meet the standards and not

require as efficient of technology to get there.

That's probably the shortest way to explain it.

Some of the manufacturers' own statements about what their future incandescent technology can do gives them enough head room, if you will, above the federal requirements to be able to absorb much of the light with the new modified spectrum coding and still comply.

So we will see what happens. But I think as incandescent sales drop more and more, some manufacturers may be tempted to reduce the number of different -- in incandescent lamps they sell. And dropping them all to a modified spectrum might be a potentially appealing way for them to go.

MR. FERNSTROM: So, Tim -- this is Gary -- are we being clear about that? The modified spectrum lamps are federally covered all right in terms of their wattage, but there's an allowance to allow them to be dimmer.

MR. TUTT: Yes, I understand. And for purposes of meeting our Huffman goals if they are dimmer and consumers accept that dimming without changing wattage bins, you still get the energy

savings.

MR. FERNSTROM: Indeed, but the speculation is because they're dimmer consumers might step up to a higher wattage level, a higher category. And furthermore, the manufacturers are currently marketing these as superior in terms of the quality of light they offer, which would further influence consumers to purchase them.

PRESIDING MEMBER PFANNENSTIEL: Are there other questions? Commissioner Rosenfeld.

ASSOCIATE MEMBER ROSENFELD: Hi, it's Art. I've had this same concern that you mentioned, Chris, early in your talk about our dimmers, Title 24 dimmers, I'm looking at Bill Pennington -- are they really the right thing to encourage.

To my mind dimming got started when incandescent lamps used a lot of energy and there was some joint reason for dimming. One was decor and the other was you actually saved electricity.

CFLs are so efficient now that the motivation is not really to save electricity, but the decor idea has caught on.

So I agree that in your dining room you're going to need dimmers. But I'm sort of

looking at -- I'm encouraging a two-minute debate between Bill Pennington and Chris about whether we should really be encouraging dimming of incandescents in kitchens and bathrooms and so on.

MR. CALWELL: It seems to me what I can do, Bill, is offer another additional thought, and then leave time for you to react. Would that be fine?

MR. PENNINGTON: I was about ready to answer the Commissioner.

ASSOCIATE MEMBER ROSENFELD: He was ready to react, Chris.

MR. CALWELL: Oh, do you want to go first, Bill?

MR. PENNINGTON: Sure. Dimmers are not allowed in kitchens or bathrooms. So, those are required to be high efficacy fixtures. Or manual on occupancy sensors in bathrooms.

Dimmers are only provided for in Title 24 for those parts of the house that have very few hours of use of the lighting fixture. And in those cases the analysis that we did for the 2005 standards was that CFLs were not cost effective because of very low hours of operation. And so dimmers ar there.

You can choose to do either one, so we didn't require CFLs in those applications. But you can choose to do those. But dimmers are required at a minimum.

So we saved a little bit of energy relative to those applications where CFLs would not have been cost effective.

That's how we got that.

MR. CALWELL: Maybe, Bill, maybe the biggest change since the original analysis is just that the base price of CFL has now become so low that they're cost effective on a bulb replacement basis only, without any consideration for the energy savings.

MR. PENNINGTON: So that's something that could be revisited.

ASSOCIATE MEMBER ROSENFELD: Yeah.

MR. CALWELL: Yeah, and so it's probably possible to show that CFLs would make sense in nearly all applications where they're aesthetically sufficient. And then what you have, as Art mentioned, is situations where people really want a lamp to be able to dim.

And my wife and I did buy some dimmable CFLs for use in our dining room, and some of them

work pretty well in a dimmer and some of them flicker like crazy and were not acceptable, so --

ASSOCIATE MEMBER ROSENFELD: And they're expensive.

MR. CALWELL: What's that?

ASSOCIATE MEMBER ROSENFELD: And they're expensive.

MR. CALWELL: Yeah. And because they're not available in mass market retail we were paying $14 apiece for them on an internet site. And so I think this points, if nothing else, to again the merits suggested by Michael and others that a new generation of super CFLs, if you will, be encouraged to be produced that no only can dim easily and affordably, but the aesthetics of their dimming more closely resembles CFLs -- I'm sorry, excuse me, more closely resembles incandescent.

Because many fluorescent technologies, when you dim them, the color shifts in a way that's not as aesthetic or as familiar as people would like.

ASSOCIATE MEMBER ROSENFELD: Okay, thanks.

PRESIDING MEMBER PFANNENSTIEL: Other questions of Chris?

MR. FERNSTROM: This is Gary. Just one more quick comment. In defense of the building standards, the way they're currently written, we believe that the super CFL has a lot to offer. We've offered rebates on one product this year by a company by the name of ULight that makes a dimmable CFL that was offered at essentially the same price as all of these other products.

So, I expect to see the growth of high quality dimmable products be substantial in the next couple of years.

PRESIDING MEMBER PFANNENSTIEL: Go ahead, Gary.

MR. FLAMM: This is Gary Flamm, CEC Staff. One important consideration in Title 24 is that we're looking at the rating of the fixture, not the rating of the lamp.

In Title 20 we're looking at the lamp. So the fixtures that are dimmed in Title 24 have an incandescent socket in them.

So the cost effectiveness is not based on the fact that a screw-based compact fluorescent lamp is now cheaper; it's we still need to bring cost effective compact fluorescent fixtures to the market at least the way that Title 24 currently

evaluates lighting.

MR. CALWELL: Yeah, I think that's a great point. I think screw-based CFLs have become phenomenally affordable because of the sheer volume at which they're being produced. And the hope is that that same phenomenon would trickle down to fixtures, even though, as everyone knows, the fixture has the components of a screw-based CFL split into two parts, a hardwired ballast and a pin-based lamp.

So, I haven't studied it nearly as intensively as I have screw-based CFLs, but I imagine, Gary, the most defining analysis is that the pin-based EnergyStar fixtures can still have a significant price premium over a conventional screw-based fixture. And if utilities direct additional attention and resources there maybe that price premium can be overcome.

PRESIDING MEMBER PFANNENSTIEL: Okay, we probably need to move on. We have a ways yet to go, and it's many others yet to speak.

Edison to speak to lighting efficiency.

MR. HIGA: Randall Higa, Southern California Edison, again. What I wanted to do in this segment, I guess the first thing is to --

(Pause.)

MR. HIGA: Thanks. So this afternoon what I wanted to do was go through those same lighting topics that I talked about this morning, and go into them in more detail.

And on some of these I may enlist the support and help from Luis from the CLTC, since some of these ideas were generated by the CLTC. So I'll try to, in the interest of time, just kind of skip over some of those that I already talked about in some detail earlier this morning. So I'll just try to sort of pick and choose those that I have more data to provide.

So, again, these are just the Huffman bill related projects. Again, I mentioned this study. And as I mentioned, it was a survey we did, in all three service territories in California. We did a variety of building types and we have all these tabulated in the report.

We looked at the distribution of indoor, outdoor plug-in versus hardwired. And also what the load per fixture is. We looked at what the energy use per foot of neon.

And I just wanted to mention a couple of the key findings there that really surprised us,

in that 70 percent of the neon we found was indoors. What's relevant there is that means that it's on all day long, as opposed to neon outdoor signage, much of which is on only during the evening.

So what that means is you have a lot of neon lighting that's on during the peak periods. So there's real opportunities to impact onpeak power both from a standpoint of energy use, but also from demand response opportunities.

Again, there was also differences in the wattage of each fixture between indoor and outdoor, and also plug-in and of hardwired. So you can see that there's some differences in the linear feet versus the wattage versus the annual kWh of the various types of lights.

Again, this will have some impact on where we may want to focus our efforts in terms of looking at various types of controls and/or efficiencies in some of the power supplies to neon lighting.

In this one we actually had a test facility set up in our lighting lab at SCE where we had a mock-up cubicle, where we had overhead lights. We have adjustable height ceiling; we

adjusted the height to the ceiling to what we think is sort of a typical office.

We tried to replicate what the most typical sort of office cubicle lighting would be, and the furniture layout, et cetera.

But we did give the users various -- we took surveys and we put people into different types of scenarios. One where they could dim the lights, ones where they couldn't, and then those of various different types of task lights and under-cabinet lights. And took and did surveys on what their satisfaction was with the type of lighting that they're given. And also when they had that ability to dim the lights, how much they dimmed the lights.

And we allowed them to dim the lights in two different ways. Sometimes we put the lights full brightness and allowed them to dim down. Or sometimes we put the lights at minimum levels and allowed them to ramp the lights up.

And as you can imagine, when they started at low level they didn't -- the end point of their overhead lighting was much less than if they started bright and went downwards.

So that was an interesting issue there

which may have some ramifications in how lighting controls are done with dimming ballasts.

The other key thing was with the task lighting and how people reacted differently and used the task lighting differently, whether it be under-cabinet, and we had both fluorescent under-cabinet lights and LED under-cabinet lights.

We also, for some of the cases, we gave them one portable LED light, and allowed them to locate it anywhere on the desk that they chose. And my interest in the beginning was to give the test subjects sort of an education in how to use those task lights in the proper way to reduce reflections and all the other good stuff, and uniform light, but we decided not to do that in the tests. And it's something that I think we need to work on in future studies. We just didn't want to inject too much into this particular study.

Again, the key findings. Overall lighting was reduced 5 to 19 percent. And those were in the cases where they were able to dim the overhead lights, and they did have some type of -- the range is because it depends on, well, the test subject range, but also depending on what kind of

task light they were using. Whether it was a combination of under-cabinet and the portable task light.

And in each case it was interesting because even though we allowed them to dim the lights to whatever level they wanted, sometimes they would, if they had only overhead lights and no task lights, they may come down to the lowest light levels, but they would also have the very lowest satisfaction levels, too.

So it wasn't that they were trying to reach a uniform satisfaction level. So, anyway, the study provides a lot of interesting sort of data on what can be done and what further tests and studies need to be done with respect to the combination of task and ambient lighting and dimming ballasts.

MR. PENNINGTON: Question, Randall.

MR. HIGA: Yeah.

MR. PENNINGTON: Is this a Title 24 kind of change or a Title 20 change?

MR. HIGA: It could be a combination of both because some of the further studies this would lead into is with regard to Title 20 is on the portable lighting and the task lighting.

Because while -- I mean there's only going to be an energy reduction if the task light is efficient.

In this case we were using the most efficient task light we could find, and it was an LED. And so the 5 to 19 percent energy efficiency range is highly dependent on having an efficient source for that task light.

So, you can try to, you know, reduce ambient lighting, which is Title 24, but unless you have that efficient task light in Title 20, it would be hard to regulate the whole thing under Title 24, because you have these plug-in loads which aren't regulated by Title 24, so --

MR. PENNINGTON: Okay, thank you.

MR. HIGA: That's sort of the tie-in. So it's really a little bit of both on this one.

I think I talked about most everything here. Again, this is where we used improved phosphorus for the T12 lamps that are used in signage. One of the issues with signs is that they have very odd sized light of lamps. They're five foot, nine foot, ten foot, they come in a variety of sizes. So it isn't easy just to retrofit them say with T8s, T5s, et cetera.

There's issues of banding where you don't want to have light, dark, light, dark. And also the continuity of lighting going across the sign, so again the signs necessitate some of these very odd, but very long lengths.

So eventually we may get to a point and the signage industry may get to a point where other types of lamps are used. But for right now in the near future anyway, it's T12. So that's why we're concentrating on this.

Again, we'll be working with other lamp manufacturers and try to drive the efficacy higher, try to play more with the spacing and the optics of the sign, itself, to get uniform light with lower wattage.

Again, this is the survey that I mentioned earlier. Not much more to say except, you know, that list there at the bottom is some of the things that we're looking at and the information that we're gathering.

We're hoping that this project would have been completed last year, but turns out that our consultant, who will remain nameless, couldn't get to enough specifiers in the period of time, I mean to get, you know, a statistically significant

number of people to get anything meaningful out of this.

So, we hope that this will be done in the next month or so. And hopefully this, again, will feed into some of these other dimming ballasts and dimming types of both Title 20, as well as Title 24 codes and regulations.

The super CFL, Chris mentioned that again. Again, those three things are the issues that are being looked at. I know that in my own home, my wife, who's an interior designer, is not going to allow CFLs in certain fixtures until the super CFL is available.

And I realize that there are lamps that are available now that's lighting -- CLTC does have some lamps in their lab that do have the high CRI and the appropriate color temperature, but they're not available at Home Depot yet, so that's something that has to be worked on.

Again, this is a sort of continuation of that task ambient lighting project. We also think that there are other areas for task lighting such as under-cabinet lights. Partition-mounted lights, again those could be the up-lights for general lighting. The portable task lights as we

use in the task ambient study. Or office torchiers.

I don't know, Luis, is there anything you want to add onto any of these or --

MR. FERNANDEZ: (inaudible).

MR. HIGA: Those are the ones that -- okay. Maybe you want to -- I'm going to have Luis take over here and just so you can get some new information on stuff that I've already talked about. There's not too much more I could add on these items. So I'll let you add more onto some of these topics here.

MR. FERNANDEZ: This is Luis Fernandez from CLTC. Is this loud enough? I can't tell here. Good.

The neon lighting systems effort is something that can be continued. There are other opportunities for improving energy efficiency. Ceiling fan lights are --

ASSOCIATE MEMBER ROSENFELD: Luis, a little closer to the mike, please.

MR. FERNANDEZ: Oh, I'm sorry. Ceiling fan lights are things that can be bought at the big box stores that anyone can install in their homes. And they're currently very energy

efficiency with respect to lighting. They come with incandescents.

So that's energy -- making these things with LED lights is not a complicated thing, so that's something that CTLC is developing within the framework of a PIER project. And we are hoping to move that into demonstration very soon.

I guess this one is a bit -- could be a Title 24 thing, too. Landscape lighting kits again, things that people can buy and self-install, are not covered right now. And if these things were regulated by Title 20, this is a very large opportunity for energy efficiency.

And there are products now available that have incorporated LEDs and occupancy sensors. So, they are only activated when someone is walking by. So, again, these things are available now and regulation could address this very effectively.

I haven't been involved with this one, so, again, high efficiency lighting is very appropriate for vending machines and beverage coolers. Especially because LEDs increase efficiency as temperature drops. So this is, again, a very good opportunity to increase the

efficacy of the light sources used in these types of machines.

And again, directional lighting is -- talking again about LEDs, the lamp products that we've seen with LEDs are much better in the realm of replacing reflector lamps than replacing general service lamps, which have still a little ways to go.

So, if certain -- especially in the low wattage ranges, they can be replaced by LEDs very soon. And those low wattage ranges are usually the ones that cause problems for replacements with, of incandescents with CFLs. But in these ranges it could be argued that LEDs are already there. So, again, this is another good opportunity.

Lighting controls, either demand response or occupancy driven. There are many applications in which they are already available. But this kind of technology is something that could be generalized and a more extensive study of where controls are feasible or useful, a more systematic study is something that we envisage as being a very useful exercise. And, again, this is related to replacing the neon technology.

Another opportunity that's related to the readiness of LEDs for low wattage, replacing low wattage reflector incandescents, is in track lighting, which predominately uses that type of lamp. And, again, something that is unregulated and people purchase and install in their homes.

And this on the more high tech approach. Studying the applicability and the mass applicability of communication -- we enter building communication systems and addressable ballasts.

So there's also the -- another approach that can be taken is to address the whole luminaire, regulate the luminaire instead of just the lamp.

There are other types of lamp -- something else that can be -- that's very important to address is the specialty lamps.

And I guess that's the end.

MR. HIGA: Yeah, that concludes our presentation on the Huffman bill-related items. Again, we appreciate the opportunity to present some of the things that we're working on.

Are there any questions?

Yeah, Jon.

MR. McHUGH: Jon McHugh, HMG. One of the research topics was dimming ballasts; and this is actually something that's been of notable importance for Title 24 is we've been expanding the scope of daylighting and increasing the use of dimming ballasts.

One of the things that is an ongoing concern is the issue of dimming ballasts actually working correctly. And the issue of flicker and of dimming ballasts dropping out either in the situation of, you know, sort of quality control of the ballasts, but also in terms of tandem wiring and wiring configurations with inside of luminaires.

I've talked with one specifier of thousands of luminaires with dimming ballasts. One of the things to work out their issues, they actually had to go through sort of a trial-and-error period with actually how the, you know, the wires in the luminaire were laid out so that the ballasts were not causing a distraction.

So, --

ASSOCIATE MEMBER ROSENFELD: Causing what, Jon? I didn't hear you.

MR. McHUGH: Causing a distraction, you

know, because of flicker or dropping out. Related to that is another issue related to flicker which is I contacted Terry McGowan. He used to be at General Electric. And he said that this is an issue; and the other issue that he's seen recently has to do with power supplies for LEDs where some of them are not using enough filtering and they're getting the 60 cycle flicker in those power supplies.

So if we expect that these products, either dimming fluorescent ballasts or also LEDs, are going to be accepted by the marketplace, some of these quality issues, I think, also have to be addressed in the standards.

MR. HIGA: Yeah, I'll make one response to that, and that is in our dimming ballast survey work we're hoping that when we get feedback from the designers and specifiers of lighting systems on dimming ballasts that -- we're specifically asking them questions about how did the, you know, systems work after they specified them.

Now, they don't always go to the site and see what happens. And, you know, talk to the occupants. But hopefully we'll get some feedback on, you know, some of the dimming ballast

performance out of our study, so. Yeah.

MR. ERHARDT: Yeah, I just wanted to comment on that last point. I'm Bob --

PRESIDING MEMBER PFANNENSTIEL: Would you -- okay, sorry. Would you give your name for the record.

MR. ERHARDT: I'm Bob Erhardt, Philips Lighting and Electronics. I'm also Chairman of the NEMA ballast section.

I wanted to report that the lighting industry is aware of compatibility issues between lamps and dimming ballasts. We have a task group that has been formed to address this issue.

We've just been involved in a rather extensive study on compatibility between lamp and ballast interactions. And we're in the process of developing standards for specifying lamp/ballast interaction.

We've also released, or in the process of releasing, a NEMA whitepaper that addresses this very issue; goes over the concerns of wiring and lamp holder interconnections are critical; and we've developed a whitepaper to address these issues.

PRESIDING MEMBER PFANNENSTIEL: Tim, do

you have a question?

MR. TUTT: Yes. Randall, I had a question about the super CFLs. Can you give us a better idea of the timeframe that effort is on, and what it's intended to lead to, particularly in terms of the efficacy of the resulting product and so on?

MR. HIGA: Yeah, I was going to say, Luis, go ahead.

MR. FERNANDEZ: Hi, this is Luis Fernandez from CLTC. I've been involved with the super CFL effort more or less from the beginning. And your question was about what's the intent relative to the efficacy beyond the color and the other things, and also the timeframe.

MR. TUTT: Yeah, the timeframe and what your expectation about the impact on the efficacy would be from that.

MR. FERNANDEZ: The timeframe. At this point in time the utilities are initiating discussions with, or contacts with the manufacturers. But that is something that's going to go on during this first quarter.

When the super CFL could hit the shelves, I assume, I think it would be hard for me

to make a prediction, but sometime next year maybe I think it would be possible. Some CFLs are very close already.

So, it would depend on many things that haven't happened yet. Many discussions that haven't taken place yet.

But it's something that's close to existing. I'm sorry there was --

MR. FERNSTROM: Tim, if I could comment on that. The objective of the effort isn't so much to increase the efficacy as it is to address compatibility and user satisfaction issues.

MR. TUTT: Yes, I understand that, Gary; and, in fact, the super CFL might be a little bit less efficient than some of the models out on the market today, but we have greater consumer satisfaction.

Is the intent to have the utilities provide incentives for this brand of CFL that does have that consumer satisfaction, and increase sales in that fashion?

MR. FERNSTROM: Indeed. The utility CFL programs have been under pressure with respect to their savings relative to net-to-gross issues. So, in order to address that, efforts are being

redirected to better products that aren't currently in the marketplace to re-establish a higher level of effectiveness.

MR. HIGA: One of the issues that can come up as CFLs become more efficient is that the more efficient newer CFLs, if they have the same light quality as the CFLs currently available, they may end up replacing CFLs that are already in service, or replacing CFLs that burn out.

And what we want is something that addresses the concerns of people who currently prefer incandescents. And so replacing incandescents is a much better efficiency proposition than replacing CFLs that are say 10 percent efficient.

MR. FERNSTROM: So there's one more quick issue with the CFL with respect to -- or super CFL with respect to energy savings. And that is the current products in the market have terrible power factor resulting in maybe 5 to 10 percent of the energy savings additionally lost in the building distribution system.

So, if power factor can be improved, energy savings overall perhaps, not that measured and paid by the customer, but from a societal

point of view, might be improved by 10 percent or so.

PRESIDING MEMBER PFANNENSTIEL: Okay, thank you. Philips.

MR. ERDHEIM: Good afternoon, Madam Commissioner, Commissioner Rosenfeld, John and Tim. My name is Ric Erdheim; I'm Senior Counsel for Philips Electronics.

I did come today because I wanted to make some comments on battery chargers, which I'd like to come back for later. So I was a little bit surprised to see that Philips was listed on lighting. But I'm happy -- Philips being a resourceful company, I have a few comments to make. And we actually have put, this afternoon a very short presentation, together that Bob Erhardt is going to give. So let me just make some brief comments.

First, as you know, on December 7, 2006, it was the Philips president of lighting who called for a worldwide effort to ban incandescent bulbs. As a result of that effort we now have a major improvement, both in California with the Huffman bill, and the federal bill. We're very proud of that.

We've come along with a new product that Mr. Calwell mentioned, the energy efficiency halogena. There's no fakery with this. We didn't move in the wattage range, in the ballast -- any of the ranges. It's a real live product that gets 30 percent efficiency today. This product's on the shelf. And there will be other products coming from Phillips, and I suspect the other manufacturers. And I think we will see significant savings from these products.

Now, we just received a couple of days ago the presentation from PG&E. And I guess it would have been more useful, I think, for this workshop if we had had more time so we could have put together not only Philips' comments, but industry comments. So we're at somewhat of a disadvantage.

But we did have a brief opportunity to review this, and I have a couple of points, preliminary points that I wanted to make. First, Chris talked about enforcement being important; he talked about it for your regulations. But we see enforcement as a critical issue, also.

We can have the greatest standards we want; we'll met the standards; the other major

companies will meet the standards. But we suspect there's going to be some people that won't meet the standards. So enforcement has to be a critical effort.

Second, we think that the focus should be on efficiency standards, not particular technologies. We think the marketplace can address the technologies.

And finally, we think the focus should be on systems and not components. And a lot of what we've heard is focus on improving the luminaire here and the ballast here, but these are all working together. And we think the critical importance is to work on systems.

And so with your permission, Madam Chair, I'd like Bob to come up and talk very briefly about that concept.

MR. ERHARDT: Again, Bob Erhardt, Philips Electronics, and Chairman of the NEMA ballast section, former Chairman of the NEMA lighting control section.

(Pause.)

MR. ERHARDT: I just wanted to expound a little bit on the benefits of taking a system approach compared with a component approach. This

has been addressed a couple of times here today. And most recently by the gentleman from Southern California Edison.

In a system approach lower limits on lighting power density has a limited ability to minimize total lighting energy usage. As an example we've heard of recommendation for specifying CEE limits for high efficiency T8. And from my experience this results in approximately a 3 to 5 percent improvement in power efficiency.

By contrast, we have some evidence that a systems approach can reduce total lighting energy use by as much as 63 percent.

It can be shown that just giving users control of light levels can result in -- we have some examples of 30 and 40 percent reduction in energy usage for some users.

If someone is working at a cad station or in front of a CRT all day, they may not want so much light. Conversely, though, if you are doing reading at your desk you're going to want the highest light levels.

When you only address lighting power density what you're doing is you're specifying the least light for the task that requires the most

light. When you use controls you allow users to have higher light levels for tasks that require them, and give them the opportunity of using lower light levels for tasks where increased light can even be counter-productive.

Use of occupancy sensors also has been shown to result in similar savings, although they're not cumulative. You're not going to get 20 percent and 20 percent because if you're running at lower light levels.

In addition, daylight harvesting can result in over 70 percent energy savings during peak periods of operation since you have the most daylight during the highest peak level. And this is of particular importance when you consider the need to build new power plants.

I've been involved -- I think this is all public domain, so I think I can speak about it -- I've been involved in the Department of Energy commercial lighting initiative. The DOE commercial lighting initiative is studying ways to quantify savings from lighting systems.

This approach is they are not only doing some modeling of lighting systems, but they are actually developing a tool that they hope to make

a web-based tool that will allow you to model your installation for verification of lighting, of energy savings.

In the model so far, lighting systems optimized just for lighting power density alone are projected to save 9 to 28 percent energy compared to a baseline. And I think the baseline was 1.7 watts per square foot. But in their models it has been shown that systems further optimized for lighting control with daylight harvesting are projected to save as much as 33 to 63 percent compared with the 1.7 watt per square foot baseline.

NEMA, National Electrical Manufacturers Association, which I'm involved in, is working with Pacific Northwest National Laboratories in developing product type specifications that can then be plugged into this model. So, that goal is that during 2008 there will be a web-based tool that will allow you to plug in specified product types; and you will be able to model your installation and verify energy savings.

It's the recommendation of Philips that -- well, first of all, it's our opinion, we share this opinion with Pacific Gas and Electric,

that lighting power density alone will not result in the energy savings needed to meet the provisions of AB-1109.

Twenty-five percent in commercial installations, if you consider installed base represents a very dramatic energy savings that cannot be achieved by product alone. You have many products that are already in the 90 percent efficiency. You're not going to save an additional 25 percent.

Assistance approach, though, however, as indicated by the commercial lighting initiative approach, could meet the requirements of AB-1109. Again, there's projections of -- there were conservative projections of 30 and 40 percent energy savings, and as much as 50 and 60 percent energy savings.

So Philips Lighting urges the California Energy Commission to strongly consider looking at a systems approach with controls when it's considering meeting the requirements of AB-1109.

Thank you.

PRESIDING MEMBER PFANNENSTIEL: Thank you. Questions? None, thanks.

California Lighting Technology Center,

is there a presentation? Yes.

(Pause.)

MR. FERNANDEZ: Good afternoon; I'm Luis Fernandez from the California Lighting Technology Center. I'm replacing Michael Siminovitch who couldn't attend this afternoon.

For those who don't know the Center, our mission is to develop and demonstrate energy efficient lighting technologies for California. And we have been involved in policy initiatives, as well.

So I'm going to be very broad and quick because a lot of this came as the result of a study that was sponsored by the CEC, and on which we worked last summer.

So, as you know, the Huffman bill was approved in October, and demands quite aggressive reductions in lighting energy consumption in California. And we consider that one of the most ambitious ones is the 50 percent reduction in lighting energy in California residences.

If we look at what's installed right now, what kinds of lamps are installed in California houses, we see that there's still a great -- the incandescent lamps are still the

norm. And that's where we believe the greatest opportunity lies.

And this is the biggest rock that we have to move if we are going to meet the goals of this legislation. There are many other things that can help. Addressing the yellow, getting sort of rid of the yellow part of those charts is the -- although in 2007 it's a little smaller. That is going to make or break this initiative in our opinion. So, as I said, it's a little higher last year.

Building codes have been very effective in new housing, so for just the hardwired fixtures, this doesn't count portables, of course, which may cloud this picture a little bit. Most of the fixtures going in in houses from a survey that we conducted are high efficacy. So this is very good news.

However, the new houses each year are a very small sliver -- see the pie chart on the left -- are a very small sliver of the existing housing stock. So, since we have a timeframe of 2018, it's very unlikely that this alone will -- you know, it's very unlikely that all of California houses will be retrofitted until then. And, of

course, there's the question of dimmers that has been addressed.

So what happens if we do nothing is, of course -- there are several examples. This is the first of several examples that we prepared last summer to see what kind of things could happen depending on the actions that are taken.

If we do nothing, nothing happens, and the lighting consumption per house will actually -- there's a trend for increasing light use in houses. We don't know if that's because the houses are bigger or people have more lamps. It would be very interesting to conduct a study and find out.

Now, there are new incandescent products that are more energy efficient, and the most inefficient lamps of the present incandescent technology is going to be banned pretty soon, in a few years. However, that only gets us part of the way. And that, alone, won't -- will get us not even halfway.

So, again, addressing the incandescents, the prevalence of incandescents is, I think, should be the main goal of an effort to meet AB-1109.

If incandescents, if people switch from incandescent to any other -- so say a technology like CFL, either at once or gradually, and we saw the results from ECOS Consulting. And so they've -- we agree more or less on the numbers.

So if there is a dramatic reduction in incandescent energy use, the goals can be met. If it's not dramatic then it's more questionable if we can get there. This is only 50 percent adoption of CFLs.

Just a final example just to see the importance of building codes. Building codes are extremely -- this is just if no lighting in houses was allowed from 2007 on, in new or retrofitted houses. First, the rate of the decrease in lighting energy consumption per house in California would depend a lot on the growth rates, the number of houses, or the renovation rate, which we can predict to a certain extent. Depends on economic factors that we can't control.

And the other fact is that it's very very effective, but it takes a longer timeframe for it to be significant. So that's something to have in mind.

So, again, we believe the goal is

achievable but it requires a very firm investment in replacing incandescents with other high efficacy technology such as CFL or LEDs.

And, of course, building codes should continue to evolve in stringency. But that may only get us a little bit of -- for 2018 that may only get us a little bit of savings.

And that's it. If anybody has any questions. Oh, there's only one thing that I -- when Chris Calwell was talking about there's households that have a lot of CFLs and there's households that have no CFLs, so the distribution of CFLs seems not to be very homogeneous. And I think that again addresses the necessity of a program like the super CFL.

Also, the difference in CFL, more men tend to buy CFLs, or men are more likely to buy CFLs. One of the things that seems to be the factor is that women have a much better ability, or most women have a much better ability to discern color by the nature of their own vision. Physiologically their eyes are different. And they have a better ability to discern color than men.

And some of the domestic conflict over

CFLs may be due to some physiological differences that are real. The research on those topics is still ongoing, so we don't know.

I'm sorry to go on for so long. Any questions?

PRESIDING MEMBER PFANNENSTIEL: Any questions?

ASSOCIATE MEMBER ROSENFELD: Except to tell Gary I think you were on the right track with super CFLs. Saving another 10 percent in energy isn't -- the problem is just what you said, get something acceptable.

PRESIDING MEMBER PFANNENSTIEL: Thanks.

MR. FERNANDEZ: Thank you very much.

PRESIDING MEMBER PFANNENSTIEL: Anybody else have comments on lighting? Noah, come on up.

MR. HOROWITZ: Noah Horowitz with NRDC. I don't have any slides. My comments are going to be focused on the federal energy bill that passed. It's law, whether we like it or not. We need to move beyond and figure out how do we live with it and complement or build -- patch the things that it didn't do right to the extent we're not preempted. So that'll be the basis of my comments.

As was mentioned by several people it's obvious, but worth restating, California and Nevada were given special treatment in the federal standard due to their existing laws. And California has the ability to move up to tier one standards each bin by year, so the 100 watt replacements rather than 1/1/2012 could be 1/1/2011. Similar, the 75s can move up. And we strongly urge and expect California to take advantage of that and to ratify that in its Title 20.

California was also given the opportunity to advance the tier two standard by two years. So rather than 1/1/2020 it would be 1/1/2018, which would enable it hopefully to get a good running start, if not meet the Huffman standard requirements.

The challenge there is it's based on a DOE rulemaking. It sets a floor, if the timing is missed or the stringency isn't sufficient, a backdrop of a minimum 45 lumens per watt for all bulbs goes into effect.

DOE has the ability to set something even more stringent. We don't know what that standard will be till 2017. I think it would, at

a minimum the CEC should telegraph its intent to adopt the DOE tier two standard by 1/1/2018 so the industry knows what's coming.

But I don't think you have the ability to write in a number because you're limited to do what the DOE does. And we don't know what the outcome will be. You couldn't, although this is probably a question for counsel Jonathan Blees from the CEC, could you adopt the minimum of 45 lumens per watt. I don't know the answer to that.

So now I'm going to shift to where the, from my personal point of view, where the energy bill fell short, and there's still the opportunity for the CEC to fill in some gaps.

Certain bases or lamp types were outright exempted, or they weren't covered by the standard. In simple language that means California, if it wants to, could set its own standards; they're not preempted.

And we think in some of these cases it's worth California proactively filling these gaps so these potential omissions don't become loopholes.

I'll start with the federal standard only covers bulbs that are medium bases. The conventional, what everybody calls today's

incandescent lamp, that's a medium screw base. You know, the one that's about that big in diameter. I don't have any props today.

But it does not regulate bulbs that have the candelabra base, the more narrow one that often has the shape of a candle on top. Those are limited to 60 watts if it has a candelabra base.

There is no reason these can't be made more efficiently. So we think -- so if you're a candelabra base and more than 60 watts you are regulated. But if you're less than 60 watts, you're not regulated. We think these lamps should have to meet the same standards. Or an alternate would be to limit them to 40 watts, which is most of these are decorative in nature. It's not a reading lamp where you really need the higher light output.

We also want to point out that Ostrum Sylvania, a NEMA member, and a major U.S. manufacturer of lamps already offers an energy saving halogen in a candelabra base configuration. So the better bulb already exists that would comply.

Now, I'm going to shift to specialty lamps that for one reason or another, while

they're not today's everyday lamp, they were exempted due to some pressure from industry. And I think we need to frame all of this, is today the reality is the incandescent light bulb, when you buy it in a four-pack, costs a quarter. And that's the least efficient bulb.

Compact fluorescents are over here at about $2 a bulb. Much more efficient and much better deal for both the environment and people's wallet. But enough people aren't willing to make the leap from a quarter to $2 a bulb, or, you know, paying $8 to $10 or so for the multi-pack.

As long as that 25 cent incandescent is still on the shelf, that's what they're going to buy. And, again, we've seen some data, a lot of Americans have multiple CFLs in the home, half the people don't. And it's, I believe, for one of two reasons. They can't get past the first cost; or for whatever reason they think they don't like CFLs or they might have tried it and didn't like it. But I think that's the minority.

So we have to get that very inefficient, very inexpensive bulb off the shelf. And that was the intent of the tier one standard.

So we will see products. Philips took

the lead, and kudos to them; their 100 watt bulb is replaced by a 70 watt improved incandescent in this form, a halogen. That bulb is retailing for $5 right now. It's a two-pack for 9.98 at Home Depot. They are the first to market; that price will probably come down with volume as other competitors are there.

I don't know if that, over time, will cost the same or less than a CFL. This is a real-life experiment. But the reality is as long as there's that 25 cent bulb on the shelf, it's going to steal sales from the CFL, the LED that initially will cost a fair amount of money or the energy saving halogens.

GE's made a lot of noise. They're going to bring a high-efficient incandescent to the market that will be twice as efficient as today's incandescent, or roughly 30 lumens per watt and has the promise to do even better. We don't know where that's going to fall out.

So that's all background. So that's the landscape. We need to make sure that there aren't loopholes that someone could still take today's incandescent technology, the bulb would cost a quarter or 50 cents, and its sales would thrive

compared to the CFL and these other alternatives.

Example number one. Vibration resistant or vibration service lamps. So imagine an escalator or a ferris wheel or some other thing that might be subject to vibration and need a little bit more of a robust filament --

ASSOCIATE MEMBER ROSENFELD: A common one, Noah, is just a garage door opener. I have to get vibration proof lights in that fixture. There are a lot of those.

MR. HOROWITZ: Correct.

MR. FERNSTROM: Or for that matter, Noah, a ceiling fan.

MR. HOROWITZ: Yes. So, it is a reality that there's certain lamps that are going to be subject to an environment where there are vibrations. And so a simple view of that would be exempt them. They deserve special treatment.

But the new efficient incandescents that are coming will have shorter filaments that will be more robust and most likely could survive these sort of environments. CFLs, in many cases, work well; LEDs won't suffer from these high vibration environments.

The potential world we're looking at is,

so I was told by industry these bulbs cost a whole lot more to put the supports on the filaments, that's what a vibration service lamp is. Take today's incandescent and put some supports around it. That costs a lot of money to make, and they don't make them in volume. Why are you worried about this, Noah?

Well, on Father's Day I was in Walgreens. My daughter scraped her knee, and on the front display, it was a whole wall display of these bulbs -- I'll pass it around. It says, it's a 12-pack of bulbs, wow, $3. It's printed on there. It wasn't a sticker. It's made by Feit Electric, who's a NEMA member, and is one of the top five sellers of CFLs. It's not some fly-by-night company.

It's an American company and it says household light bulbs in big language, big font. And that looks like your regular light bulb. And it says 60 watts. And that's a 12 pack. So these only cost a quarter.

So before the federal standard goes into effect we already have a vibration service bulb available for a quarter. So what's the consumer, who's not predisposed to buying a CFL going to do?

They're going to gravitate towards this. So this is a huge potential loophole.

And worse yet, it's 60 watts at 600 lumens. That's 10 lumens per watt. The regular 60 watt bulb, the conventional ones, around 800 lumens. So this is 25 percent less efficient. So we'd be going backwards. We'd be worse off than having a federal standard if this bulb takes off, which we posit it would.

So we think the solution here is simply to limit these to 40 watts. Again, you're not going to be putting this in a reading lamp. You'll still get sufficient light output. If you want to use the regular incandescent, we don't think people would be gravitating towards a low light output incandescent.

So we think that's the patch and you can still put this in your garage or your ceiling fan or those other applications if you chose to. So that's number one.

To be thorough, the DOE rulemaking, the approach they took was -- or, I'm sorry, in the federal legislation, if sales double of this technology or some of the other ones, then DOE is required to do a rulemaking. And then if they

don't meet a certain deadline, then there's some sort of failsafe in this case. It restricts the power to 40 watts.

We think California could get ahead of this. Let's not have to rely on DOE getting the data, acting upon it, having an on-time rulemaking. We'd lose several years through that process, given DOE's track record.

Next I want to point your attention to what are called shatter resistant, or shatter proof bulbs. There are some environmental where it would be unsafe for the bulb to break. Imagine a food safety application or a gymnasium where the ball would hit the light bulb and it would break. You don't want that to happen.

Legitimate. A few pennies you can put a plastic coating on today's incandescent bulb. It's clear; it would give off roughly the same amount of light. Now I'm selling a 27 cent incandescent light bulb. Same story, people are going to flock to the shelves

Just the fact that you have a clear coating on there that provides this special protection against breakage, that doesn't adversely impact the efficiency in a dramatic way.

We should subject those to the same regulations. Right now those are exempt, as well. So that's shatter resistance.

Three-way light bulbs. They're given the same treatment as well. They're not covered unless their sales take off. We already have three-way CFLs. Why is there an exemption here.

So those are the ones where we bring to your attention. And we're concerned that if we don't address those now, we're setting ourselves up for several years of accelerated sales, and we could miss out on meeting the Huffman requirements if we don't act proactively.

MR. FERNSTROM: Noah, do you know how 130 volt lamps are treated? I don't, but I see them in stores, and they're less efficacious than 120 volt models. They're often sold in contractor packs and so on.

MR. HOROWITZ: Yes. I have to look at the legislation. This came up, so you know, the traditional bulb might be 110 or 120, what's to prevent somebody from making a 121.

So the standard covers 110 to 130. I don't know if above 130 is practical in our system. And if it were, is that not covered, and

should California step in or think about stepping in.

MR. FERNSTROM: Well, just to add a little bit to that, the 130 volt lightbulb was originally developed for cases where utilities might have high line voltage so you can get a reasonable expectation of life. And utilities rarely have high line voltage any more, so you could make the argument 130 volt lamps aren't really needed or shouldn't be treated specially.

PRESIDING MEMBER PFANNENSTIEL: Yes, Gary.

MR. FLAMM: This is a question for Gary Fernstrom. Isn't it true that if I take a 130 volt lamp that meets the new federal requirements, operate it at 120 volts, it no longer is high efficacy?

MR. FERNSTROM: Yes, because the light output increases more proportionately than the power reduces.

MR. HOROWITZ: Gary, the language, without getting into too many details in terms of what is covered, and therefore preempted by California. The lamp must be capable of being operated at a voltage range of at least partially

within 110 and 130.

So let's talk offline without boring everybody, but is this a problem? If so, what's the fix?

PRESIDING MEMBER PFANNENSTIEL: Thanks, Noah. Further questions?

ASSOCIATE MEMBER ROSENFELD: Noah, I'm a bad notetaker. You said there are three villains. One is vibration, --

MR. HOROWITZ: The vibration resistance that --

ASSOCIATE MEMBER ROSENFELD: -- one is the anti-shatter. And what was the third?

MR. HOROWITZ: Three-way light bulbs.

ASSOCIATE MEMBER ROSENFELD: Oh, three way, thank you.

MR. HOROWITZ: And some of these terms have multiple terms in the field, so it's vibration service, also called vibration resistant. And there's shatter resistant and shatter proof, all describing the same thing technically.

MR. FERNSTROM: Well, and I think we ought to add to that list maybe 130 volt light bulbs. I don't think we know.

PRESIDING MEMBER PFANNENSTIEL: Tim, question?

MR. TUTT: Noah, the federal bill does define vibration service as fairly specifically as requiring that it be marked on the package and not be sold in the kind of packages you passed around. Does that make a difference in your mind?

MR. HOROWITZ: I need to look at that more carefully. That helps, but I don't think it completely solves the problem.

PRESIDING MEMBER PFANNENSTIEL: Thanks, Noah.

MR. HOROWITZ: Thank you.

PRESIDING MEMBER PFANNENSTIEL: Any other discussion or comments on the lighting?

Okay, let's move on to the discussion of battery chargers. Power Tools Institute.

MR. ALBERT: Good afternoon. My name is Larry Albert; I work for Black and Decker. I offer my comments today on behalf of the Power Tool Institute, which is a trade association of power tool manufacturers. Thank you for offering me this opportunity to make comments to the Commission.

I'd like to be able to talk a little bit

about the anticipation of creating regulation regarding battery chargers. Know that there's a test method currently being released that covers a wide range of testing, wide range of products to be tested. And specifically want to talk about the impact that regulation would have upon battery chargers intended for small appliances, including power tools.

Overall we support national regulations regarding small appliance battery charger energy efficiency. And also we're supporting the harmonization with any potential international standards that might be developed.

We acknowledge that California has demonstrated a leadership role in promulgating new energy efficiency standards that have ultimately become national standards, either through adoption or in fact.

It's not in our industry's interest to have multiple standards, perhaps with diversion coverage and diversion approaches. It's much more effective for us to have a single standard through North America, and possibly throughout the world, that reflects the method by which energy efficiency for battery chargers would be

evaluated.

Therefore we'd like to request that the Commission consider encouraging their staff to work cooperatively with other standards-making bodies that have an interest in developing these standards, so that we'll have a common standard at least throughout North America.

We'd also like to make the same kind of offer that we've made in the past with respect to working cooperatively and collaboratively with the Commission Staff to help develop these standards in a way that makes sense for industry and makes sense for furthering the goals of higher energy efficiency and appliance battery chargers.

One problem that we have as a trade association is our inability to comment on a wide range of different applications of battery chargers. We make power tools and we can speak somewhat knowledgeably about those products and the battery chargers intended for them.

However, we have difficulty in reflecting any sort of competent commentary when it comes to things like golfcarts and other sorts of products that are being considered in the test method.

Consequently, we'd like to encourage the Commission to consider adopting criteria for acceptance in the standard for appliance battery chargers separate from maybe some of these other categories of products. Because we believe some of the differences in how the products are being used and how they're evaluated may justify that.

We believe that battery charger energy efficiency regulation should seek to ascertain the excess energy consumed by the battery chargers over and above the energy that is recoverable from the battery.

We believe this is best achieved by considering the energy used by the battery charger in representative use conditions. That would also include active mode energy. I know this is one of the issues that's come up in the past.

And we also believe that any energy efficiency standard should be sensitive to the possibility of having technological improvements and innovations occur that could fundamentally change how battery charging is achieved. And therefore should not be too prescriptive with respect to design requirements in the energy efficiency standard.

That's all the comments I have at the moment. Any questions?

PRESIDING MEMBER PFANNENSTIEL: Thank you for being here and participating. Are there questions? Bill.

MR. PENNINGTON: Yes. I'm wondering if your trade association commented on ECOS' test procedure during the development process? And to what extent do you view those as reasonable?

MR. ALBERT: I guess our perception of the test procedure is that it's the energy efficiency standard that is actually the important element of all of this. And to the extent that a test procedure provides sufficient data to support the energy efficiency standard, then it's adequate.

And so in that sense I think, since we don't know yet what that standard would look like, right, but presumably it would contain information -- would require information from active mode standby and maintenance, right. And that's provided by the test method.

As long as the test method provides reasonably accurate information in that regard I think it, and perhaps other ones, would satisfy

that goal.

MR. PENNINGTON: So you didn't particularly object to that test procedure as it was proposed? I think I understand your point --

MR. ALBERT: Yeah, I think --

MR. PENNINGTON: -- that it needs to be matched with the standard --

MR. ALBERT: Right, right. I believe that might have been the comment we made somewhere along the line, that we said, you know, we're unsure how the data's going to be used, so it's hard to ascertain whether it's appropriate or not, right.

And it may come out that as the standard is developed that there might be a recognition that there's information that for small appliance battery chargers that the information, there might be a piece of information that's still needed, in which case you'd expect that the test method would be adapted to provide the additional information.

MR. PENNINGTON: Thank you.

PRESIDING MEMBER PFANNENSTIEL: Thank you. Any other? Thanks very much.

MR. ALBERT: Thank you.

PRESIDING MEMBER PFANNENSTIEL: PG&E/

ECOS. Ted.

MR. POPE: Thank you, Peter. Ted Pope, Energy Solutions, on behalf of PG&E. Again, thanks to the Commission for allowing us this opportunity to talk to you briefly this afternoon about power -- excuse me, battery charger test methods, as well as standards, discussing potential standards activities.

I want to note that these slides and all the research behind them were prepared by ECOS Consulting. Unfortunately their staff couldn't be here today. I don't know, do we have Dr. Paul Bendt on the phone?

DR. BENDT: Yes, I'm here in our Colorado office.

MR. POPE: Great. So, Paul is the gentleman that runs ECOS laboratory that does a lot of the testing on battery chargers and the small consumer electronics. And very involved in the development of the test method and thinking about potential efficiency standards going forward. And so he's on the line to catch any technical questions that I'm unable to answer if we go to that depth in the conversation.

First of all, and I think I'll try and

run through these pretty fast. I think the Commission's heard a fair bit of the test method discussion in the past. Wasn't sure how much dialogue there was going to be between industry and the PG&E team, so we probably have more slides than we need. Stop me, please, if I'm going too fast.

But a quick definitional comment. Battery chargers -- and let me say that I'm going to first start out talking about the test methods. So my first slides are on test methods.

Battery charger system refers to both the charger and the batteries to which they're attached. And it's a pretty comprehensive scope we're talking about here, ranging all the way from, you know, electric toothbrushes all the way up to golfcart battery charging systems and electric cars and so forth. So the test method scope is quite broad.

The products, again all over the map. You can see here on the chart, broken out into ten descriptive categories. Starting with number one being the most common, all the way down to the least numerically common lighting lanterns.

But you see things like on electronics,

cellphones, cordless phones, various different information appliances, laptops and so forth. Emergency backup systems, personal care products, tools, universal battery chargers including auto chargers, RV battery chargers and all the way down to the small cell chargers.

Just taking a quick peek at the development of markets here. We're showing some of the highest growth products here in this graph. You can see that things are going in different directions, product category. Portable CDs not surprisingly are dropping market share, as MP3s pick up dramatically.

Again, cordless phones similarly being replaced by cellphones. Things like PDAs, Bluetooth headsets for cellphones. And laptops are all on the rise in a significant way. And these large growth trends are what make the relevance of test methods and then standards even more significant than they might appear today because the situation's increasing in terms of market saturation and energy use.

This is a quick slide showing the estimated market share. We calculate there to be about 126 million battery charging products in

California. That translates to about nine per household. So these products are ubiquitous.

You can see home electronics, cellphones, cordless phones and information appliances together constitute three-quarters of the market.

Going into a little bit more history on the test method that was completed in September of this year and posted on the site you see on the screen, efficientproducts.org. Over the years this site has been used to explain and post the various different versions of the test method.

And again I apologize for the redundancy, I just want to emphasize the sort of transparency of the process, the vetting process that's occurred over the last four years in this test method. Originally NRDC funded ECOS to start researching the opportunity in battery chargers. And then starting in 2004, ECOS came out with its first draft. Got a slide later showing who funded what, but a combination of PG&E as well as you see PIER funds behind this.

And there have been four different versions of the test method since 2004. Again, the final version being in the fall of 2007. And

at each step of the way there's been a workshop to discuss the drafts, public comment.

The last draft alone received over 100 comments for which the ECOS Staff, with assistance from industry, I'm sure, resolved on the order of 100 questions and issues raised in that fourth draft.

And so the ECOS team considers the test method to be essentially done now. Again, I think Larry made some great comments moments ago. It's very important that your test method be generic in its approach so that it's not focused on a particular product cycle.

You don't want to show bias or favoritism in how you structure the test method. And the team believes they've come up with a test method that best is able to characterize the key data inputs tat would be needed for development of a sound standard.

Larry mentioned there might be other considerations. I personally don't know offhand what those might be, but I know the team has worked very hard to make sure that the test method is sufficiently comprehensive to enable the development of test methods.

And we also totally agree with PTI that it would be best if the CEC worked together with other standards bodies or codes bodies around the country, North America and internationally to try and harmonize on the test method. And then that allows, to the extent jurisdictions need to have different standards, efficiency standards, at least they're using the same test method providing the same information.

MR. PENNINGTON: Ted, could I ask you a question --

MR. POPE: Yeah.

MR. PENNINGTON: -- about the process on the test procedure review? To what extent was the Department of Energy --

ASSOCIATE MEMBER ROSENFELD: Bill, I can't hear you.

MR. PENNINGTON: To what extent was the Department of Energy and EPA involved in sort of the vetting process, or the review process of the test procedure?

MR. POPE: My understanding is certainly EPA was quite involved. Paul, can you handle that question? How much was DOE involved?

DR. BENDT: We did receive extensive

comments from DOE and DOE's consultants; and have incorporated a lot of them in the final version of the test procedure.

MR. POPE: And I think, as may have been mentioned in previous conversation, DOE established a test method, and they left a gap in their test method which did not address active mode charging efficiency. They left kind of a placeholder for that, pending development of the active mode test method components in the ECOS activity, or perhaps others.

MR. PENNINGTON: I'm wondering, another question -- does that interaction with those agencies indicate in your mind an openness on the part of DOE to consider ECOS' test method as an improvement. And, you know, would be open to considering that for readoption of the test procedure?

MR. POPE: The answer is yes. Personally I'm not totally in control of the details of how that would be executed, but the sense we get, you know, unofficially, is there's interest in that.

MR. CALWELL: This is Chris Calwell still on the line. I think that's probably right.

Both organizations have made public comment about -- by both organizations I mean DOE and EPA, they've both made public comment about their own procedures moving forward to include active mode.

And so this would be the sort of default place to start from as both agencies decide if and when and how to do that.

MR. PENNINGTON: Thank you.

MR. POPE: Okay, just another slide or two on the test method. This slide here is letting you know that the ECOS team has conducted tests on 60 products, in fact, as we speak that number's probably going up, since the completion of the test method.

However, there's a grand total of about 250 products for which folks, including EPRI, ECOS and Cadmus have tested, again, 250 products with the foreknowledge of how the test method was working out. And those datapoints were collected in a way that allows them to extrapolate the results. To, you know, convert them as if they were tested under the current test method.

So, we're looking at about 250 datapoints, growing every day. And the dataset includes a 24-hour charge and maintenance

discharge efficiency, maintenance mode power, no battery mode power. We'll get into that in a bit here.

Okay, here's just a snapshot of the datapoints collected so far. Chris, you're going to have to remind me how many datapoints, but I think we expect quite a few more by the end of April. Are we doubling the number of datapoints or is there more than that, Chris?

MR. CALWELL: Paul is probably sitting next to the pile of products yet to be tested. What's your sense, Paul?

DR. BENDT: I think there are going to be quite a few more as we keep going. And we're trying to make sure that we get products in all the major product categories to make sure that we really have a good spectrum of products tested.

MR. CALWELL: Yeah. What I should say, Ted, is this is, of course, just the early data collection phase from the products, we, ourselves, have purchased and tested.

But normally the process is an invitation goes out to industry to say that to have procedures done, we encourage everyone to measure their own products according to it and

bring their data to the table for an even larger analysis.

MR. POPE: Yeah, great point. I want to emphasize that the ECOS team does not feel that the dataset they have is sufficiently representative of the shipping weighted or saturation weighted products in California. And so these additional datapoints are important to get.

This graph here shows a good portion of them. There are additional points off to the right for higher amp hour systems. But you can see quite a few here. Four different battery chemistries, nickel metal hydride and NiCad, lithium ion and lead acid. That's just to give you a sense of where the efficiency falls out as a function of battery energy capacity.

Okay, this, I think, perhaps is the most important slide in this presentation. On the left side here you see five bars, each with two sections.

The green is what we call the overhead or the inefficiency associated with the charging and overall energy use of the battery charger system.

The blue represents the actual energy being delivered by the battery system. So the combined, under the current scenario, we're estimating California battery charger energy use to be about 4000 gigawatt hours a year. Again, of which 3600, you know, in some sense, is wasted.

Because of the external power supply standard adopted by California recently one would expect about a 5 percent reduction in that total energy use due to the efficiencies there.

In a moment we'll be shifting into our standards discussion. And we're in the draft stages of playing around with ways of setting standards, and kind of coming to one possibility that shows a savings of 42 percent relative to the current probably 37 or 38 percent savings relative to things once the external power supply standard takes full effect.

Thinking about a two tier approach with the second tier savings 77 or 72 percent of the energy, depending on what your baseline is.

Again, just to give a point of reference, the practical limit, based on some existing products, I understand these are probably slightly larger battery systems that benefit in

terms of efficiency from their size, but without going to the time machine you're looking at a possibility of a very small amount of wasted energy relative to energy delivered by the battery system.

Just looking at the top five biggest energy consuming categories, cordless phones in the lead with universal battery chargers, marine, auto, residential chargers at 245.

Information technology. Commercial laptops are big, down to cellphones. Not shown here, because we don't have sufficient data yet, the ECOS team is collecting it and be happy to get more from industry -- it appears that the large battery chargers, forklifts, vehicles that sort of thing, represent about 30 or 40 percent of the total battery charger energy use, which again was about 4000 gigawatt hours a year.

ASSOCIATE MEMBER ROSENFELD: Ted, let me ask you a question. I feel stupid about this, but you said that slide 9 was very important. And I was looking around for the four different colors of sorts of batteries. And this doesn't seem to be labeled for any sort of battery. Why am I so confused?

MR. POPE: I apologize, Art. I may have misspoken. What we're showing here are different scenarios assuming different product efficiencies. The left side is the current situation. And, again, the green, the top part, so from here up is, you know, quote-unquote, wasted energy.

This is the amount of energy that's actually coming out of the battery and serving the consumer.

When the EPS standard is fully deployed in products in California, you'd expect to save about this much energy. Again, the amount of energy that ends up as unusable heat for the most part, is this large bar.

We're going to be talking in a second about a standards approach that delivers savings of this difference here, on the order of, you know, almost 40 percent, depending on whether you consider your baseline to be this level here or this level here.

Does that make sense?

ASSOCIATE MEMBER ROSENFELD: But I'm sorry, the intrinsic properties of the battery enter here. Lead acid isn't the same as NiCads and so on.

MR. POPE: I see. That other slide may have been confusing. We were just showing the different datapoints. It is true that battery chemistry does have some effect on the efficiency of your battery charging system.

I think --

ASSOCIATE MEMBER ROSENFELD: But mainly you say it's the charger.

MR. POPE: Yeah, well, battery chemistry is definitely a factor, but I think how you manage that battery chemistry is a big factor.

ASSOCIATE MEMBER ROSENFELD: Okay.

MR. FERNSTROM: So, Ted, could we ask Chris and Paul to chime in and help us understand how this slide relates to the different battery chemistries?

DR. BENDT: Yes, --

MR. CALWELL: Do you want to take that one?

DR. BENDT: -- this is Dr. Bendt. There are some differences in battery chemistry, but the differences from an efficiency perspective are rather small. The most efficient batteries are the lithium ion and they have a round-trip efficiency in the battery that's about 97 percent;

so about 3 percent of the energy is wasted in the battery chemistry.

Lead acid, nickel metal hydride and NiCad batteries are all in the vicinity of 85 percent. So again there's about 15 percent of the energy is lost in the battery.

That very far, right-hand column that shows the energy consumed by the charging process, at just 100 gigawatt hours, assumes a mix of battery chemistry that is typical of the mix that's out there right now. So that practical limit, in fact, can be achieved even using a NiCad, the lead acid and nickel metal hydride batteries.

All the waste that is above that, the other 3500 gigawatt hours, is all being wasted in the charger, not in the battery chemistry.

ASSOCIATE MEMBER ROSENFELD: Very good. Thank you. You've answered my question.

MR. POPE: And just a quick comment. Obviously in heating climates there are some interactive effects with indoor battery chargers.

Okay, so again the slide is just to try and clarify the magnitude of savings opportunities here, particularly if you're looking at a two tier

or more approach over time.

Here just what is the difference in energy use from one mode to another? You know, obviously it depends on the duty cycle and the equipment and a lot of things, but on average, this is the estimated summary of what amount of energy is going into active charging versus maintenance mode versus no battery mode.

And you can see that the active mode represents on the order of 50 percent of the energy use. This slide also shows approximately, in our first round of analysis, how much energy could be saved in each of those modes. And as you can see, it's something on the order of a third of the active mode. It's a large part of the no battery mode, and about half of the maintenance mode. So, big opportunities without doing huge backflips.

The efficient design strategies to meet a potential efficiency standard involve don't overcharge the batteries; more intelligently reduce the standby power when not actively charging; and insure an efficient power conversion process eliminating excess heat.

Part of this includes the efficiency of

the power supply, as we've talked about. And we've already gotten those benefits to a large extent in California through the EPS standard, although the federal government did not include EPS as part of battery chargers -- or, excuse me, exempted EPS associated with battery chargers.

MR. CALWELL: Ted, probably the one point here, of course, is that so many battery charging systems use internal power supplies for which no regulation has yet been adopted.

MR. POPE: Excellent point. Is that on the order of half, Chris, or do you have a number for that?

MR. CALWELL: Paul, I think your team was looking at it, and it's incredibly difficult to estimate on the energy weighted basis. So I don't know if you have any more to add there.

DR. BENDT: I'd say of the products we've tested in the lab, at least half of them are internal power supplies. So it probably is about a 50/50 mix.

MR. CALWELL: It's just that those tend to be the larger, higher wattage products, so it throws the energy weighting a little bit.

MR. POPE: Okay. All right, thank you.

Just moving along here, economic considerations for a standard. And, again, I'm going to get into, in a minute, how we'd approach actually estaBlishing a standard.

Just some slides here from the ECOS lab showing three different products. I want to emphasize at the bottom of the screen we imply there's a minimal cost associated with a more efficient approach, yet when you look at the purchase price you see 95, which is three times that, and almost four times that.

I want to emphasize that the prices you see reflected are extremely different, not because of the efficiency involved, but because of the features and the actual product in question. I believe ECOS has done some of a little bit of a teardown analysis. And my understanding is to get to at least the first tier and perhaps close to the second on battery chargers, they think you're looking at about 60 cents manufacturer cost; something I think over $2 incremental cost to the customer.

Another slide here again showing efficiencies. You've got two very similar products, one at 13 percent efficient, the other

at 27.5. So, one's twice as efficient as the other. You can see the difference between maintenance mode and no-battery mode. And, again, purchase price on the more efficient product is lower here, but that's in part because the inefficient one comes with an extra feature, the car charger.

Another example here, cordless phones. Almost a factor of two difference in the efficiency; and price being fairly similar. And, again, the incremental cost associated with efficiency is minimal.

Another couple products here. Getting to how do you approach the standards process. Again, there are three key factors. There's active charging efficiency, maintenance efficiency and no-battery mode efficiency.

If you're looking at the active component, you can think of it in two ways. An efficiency ratio of the energy coming out of the battery that does usable work divided by energy going in over a 24 hour period to charge and maintain that charge during that 24 hour period.

You can also look at it as a battery has to have a total energy -- excuse me, the energy

consumed in charging the battery during a 24 hour period has to be less than or equal to a formula which has a constant reflecting the maintenance mode. And then a coefficient for the active efficiency, active charging efficiency times the battery capacity.

The strategy here is, again we're thinking now of maybe the best way is a two tier strategy. Maybe some tie-ins with EnergyStar or other voluntary standards to ramp this in on the voluntary side to give industry a chance to scale up to this.

Again, we emphasize the benefits of coordinating with industry and efficiency advocates and code agencies around the country and the world. And maybe, you know, something more on the order of how power supplies worked out.

Here's a hypothetical curve ECOS drew through the datapoints. Get caught up here.

And that is the active mode efficiency there. We're showing that probably an intelligent standard would have the efficiency start low for very low capacity battery systems, and then increase. And then, you know, continue to slope up and flatten out a little bit once you get above

10 or 20 watt hour battery size.

The two other components, the maintenance power and the no-battery power we're showing potential levels here. Noting on the first chart here, this is a flat line. If you look at the data one might draw the conclusion that there should be some slope to the line there. Depending on as more data comes in, maybe a tier one approach might have a slight slope to this maintenance battery energy curve; and a tier two might be flat as far as measured battery energy. And then no-battery mode, doesn't seem to be much reason at all to have the sloped line. That would probably just be flat.

Taking a look now at the overall process for developing standards and what the timeframe is. Everyone is aware that the DOE is pursuing, has developed a test method and is pursuing an efficiency standard.

Again, we had initial research funded by NRDC. In the timeline -- you can look at this offline, but it basically showed how the thing unfolded in terms of development of test method. I think the important part when you look at is what's going on here. You can see that the DOE is

expected to begin a determination analysis in I believe the third quarter of 2008. And so they will be working on that until the end of 2011.

And basically the Energy Commission has this timeframe to get out in front and establish a test method -- excuse me, a standard. And that would be helpful in developing a DOE standard, as well.

So we need to get moving on a CEC rulemaking, which we're obviously starting now. The expectation is we'd have a final standard the beginning of next year for effect in 2010, which gives about a year, year and a half for California to deploy that standard before DOE finals its rulemaking.

Regulatory considerations. Ten states have pending legislation on external power supplies. Federal energy bill which passed in 2007 defines class -- external power supplies which do not have EPS associated. So there is no preemption, as we understand, at this time.

And, again, I mentioned the timing on the determination. I failed to mention that the federal standard would take effect in 2014. And, again, we want to consider coordinating with the

Canadians, Europeans and others.

And that's pretty much it. Paul or Chris, any key points I miss there?

MR. CALWELL: The only one I would add, Ted, is that the three-year date. This one is an interesting question. The federal legislation that was just adopted is actually silent on the time period between final publication of decision and effective date.

So three years might be typical, but it's only a guess; that DOE would actually decide the time between adoption and effectiveness.

PRESIDING MEMBER PFANNENSTIEL: John.

MR. WILSON: So going back to your standards concepts, slides 18 and 19, I understand this is early in the thinking process, but on the other hand we have to move pretty quickly. So I want to make sure I understand this.

Are you suggesting that we would have a standard with three metrics?

MR. POPE: Yeah, and the one thing we'd like to see the Commission avoid is trying to create a whole plethora of different standards for slightly different products. And I think that will be probably a big part of the discussion with

industry over the next year.

But we would propose to set the three factors, you know, active mode, maintenance mode, and no-battery mode, and set it sort of a level for each.

And perhaps products divided into two categories somewhat conveniently. For example, frequently charged might be one category; infrequently charged might be another. And you might emphasize differently the three characteristics, depending on which product category you're regulating.

That make sense, John? So, for a product that spends very little time charging, is mostly maintenance mode, you might emphasize the efficiency in maintenance mode. For a product that gets a lot of heavy charging like a cellphone, for example, it's spending more time in charge mode. You might, you know, emphasize efficiency there, to insure savings.

MR. WILSON: I do follow that. If we were to do battery chargers in 2008 we would need a proposed standard pretty quickly. Is PG&E going to make a proposal? There's some important details left hanging here.

MR. POPE: Yeah, John, the reason -- we need a little more in the way of data to feel highly comfortable setting a specific level for each of those three things.

And our expectation is that we'll have what we consider a reasonably sufficient dataset within a couple months.

MR. FERNSTROM: So, John, the answer is yes, PG&E is prepared to make a proposal, but as Black and Decker pointed out, the devil is in the details here.

So I expect there's going to be a need for a lot of discussion and vetting with industry over where the proposal actually winds up, and what a consensus may or may not be on it.

MR. POPE: And one of the ways to insure this moves quickly is for industry to be encouraged to do their own testing and contribute the test results on their products to the overall pot. And then we can work to make sure we balance the test results be representative of the California market so that the standard we're developing is consistent with the reality out there in the street.

MR. FERNSTROM: So the bottomline, we

need to move quickly; we'll have a proposal; it's probably going to merit considerable discussion.

MR. WILSON: So, I'd note in your backup slides, and I don't know if people in the audience have copies of the slides, but you do have slides that talk about categories of infrequently used and frequently used.

Now, in the EPS standard a few years ago, of course, we wrestled with this question of how do you define infrequently used. And so I hope that you'll think really hard and specific about how that would be defined.

And I'm sure Larry Albert would be more than happy to help you think about that.

(Laughter.)

MR. CALWELL: Yeah, and, John, I should -- this is Chris -- I should probably add that it's not an infrequently used product would ignore active mode efficiency. So, Ted's point, I think, was that you could give relatively more emphasis to one or the other, and therefore insure the Commission's still getting savings in all modes from all three products. But putting the most emphasis in the place where you're likely to get the most savings in that category.

MR. WILSON: No, I understand that. But there's also this interesting slide 23 in the backup slides; it talks about different scenarios. And I assume this -- I don't know if you want to try to explain this, but it talks about how the EPS standard would relate to the battery charger standard.

MR. POPE: Chris, do you want to take that?

MR. CALWELL: Actually I don't want to take that, but I might have -- I don't have the final slide sitting in front of me because of the web link. So, Paul, can you comment on that?

DR. BENDT: We would propose that the EPS standard actually does not have any direct relevance to the battery charger standard. But there is a question about what should be considered the basecase of what's the energy consumption before a battery charger standard goes into effect.

And we acknowledge that there can be two different assumptions about what the basecase is. One assumption would be that the basecase with the chargers that we're seeing in the marketplace right now, and the second assumption would be that

would be a basecase in which the products are the same as what we're seeing now, but they are all shipped with efficiency level four, you know, California tier two compliance -- power supplies.

But that would affect only sort of the basecase assumption. It wouldn't affect the final battery charger standards for the energy that would be consumed in the final situation of -- replacement with the battery charger standards in place.

MR. WILSON: Okay, that's a different issue than I thought you were maybe getting at, which there is this question we had talked about a few years ago of if you do have a battery charging system with an external power supply, are they subject to both standards or just one standard. Have you guys thought about that?

DR. BENDT: Again, this is Dr. Bendt. We have certainly kicked that around. And whether a battery charger that also has an external power supply could be subject to both standards, I think ultimately is really up to the Commission.

But what we were looking at was probably a standard in which in order to meet the battery charger standard, one of the cheapest means of

meeting it would be to have an efficient EPS, an efficient power supply, that that would be one of the cheapest things to substitute.

In practice, the strategy a lot of manufacturers would use to meet the battery charger standard would be to use an efficient power supply whether they were required to or not.

MR. WILSON: Okay, one last question. Going back to slide 10 when you had the gigawatt hour of savings and you had the footnote in percentage terms, but that actually means that the large battery systems, if they're 30 to 40 percent of the total, I take that to mean 1200 to 1600 gigawatt hours.

So that's really the big category. I'm just sort of noting that. I don't know if there's anything other interesting to say about that, but --

MR. CALWELL: And, John, I should say with that category it's by far the hardest for us to get data because the devices are expensive, difficult to get into our lab, and there aren't that many different varieties out there.

So you can imagine sort of a data collection effort where it looks like there's that

much energy use, we try to spend some extra time with those out in the field and measuring them with instrument-grade portable meters instead of trying to get them into our labs.

And EPRI is assisting us with that under a subcontract. But, it's the hardest data to gather in our experience.

MR. WILSON: Now, Edison's been obsessed about forklifts, haven't they? Do they have data?

MR. CALWELL: You know, we have talked to them and here it's worth clarifying that the scope in our case is single-phase devices below -- Paul, is it the 2000 mark?

DR. BENDT: That's correct.

MR. CALWELL: Yeah, so what we're really looking for, John, is a category of large battery chargers that sit above consumer rating, equipment like the graphs have shown you, but below the scale that Edison specifically has analyzed, which I believe are mostly three-phase, really large scale industrial forklift.

So it's a little bit of a nuance, but that category hasn't gotten a lot of attention so far.

MR. WILSON: Okay, thank you.

MR. FERNSTROM: So, John, just an observation about battery chargers. We've looked at external power supplies and battery chargers because Commissioner Rosenfeld, about six years ago, expressed an interest in them.

Indeed, they're a large opportunity. But battery chargers in particular are very complicated. So last time in the last appliance standards go-around, we decided to defer and study that opportunity some more.

So we're like three years into the process now and we're close. But, as your questions would indicate, it's a pretty complicated opportunity.

MR. WILSON: Well, we'll look forward to you working on it quickly.

(Laughter.)

MR. POPE: Thank you.

PRESIDING MEMBER PFANNENSTIEL: Anything else, Ted?

MR. POPE: No. Thanks for the opportunity.

PRESIDING MEMBER PFANNENSTIEL: Any other questions for Ted or Chris or ECOS? Yes, go ahead.

MR. ERDHEIM: I don't have a question -- Commissioner, I don't have a question for him. I just wanted to make two additional comments. Ric Erdheim with Philips Electronics.

We're interested in the battery charger issue because of our Norelco shaver products and our SoniCare toothbrush products. And I'm just going to make two points.

First, in terms of the Norelco shaver products we saw a slide that talked about infrequently used products. Well, the shaver products are infrequently plugged in products. We raised this two years ago at the hearing. The Commission made a number of changes in the external power supply standard which we appreciate. But unfortunately, didn't address that issue.

And as a result the battery -- the beard trimmer that I use once a week, which lasts about 13 charges, so that means once every 13 weeks I plug it in for a few hours, which would be four times a year. Even if I forget, we're talking about four days that it's plugged in.

So we've gone back and, to comply with the standards, we've put in a more efficient

external power supply. And I don't think you could measure the savings that you're going to get out of that product.

So as you deal with energy as battery chargers, we would urge you this time not to get into the infrequently charged products, or infrequently plugged in products, which we really don't think there's any energy savings.

In terms of the SoniCare product, we all know that that's not a particularly efficient charger. I wouldn't stand up here and tell you it is. But it's used. The inductively charged toothbrush is used for a simple reason, and it's got to do with safety. I don't think we want to have an exposed plug on a sink where you're using a product with water.

So, if you're going to do something in terms of battery chargers you either have to exclude toothbrushes or inductively charged products, or separate it out and deal with it separately.

And I want to make sure that we get that on the record early, because I don't think we want to be banning electronic toothbrushes.

Thank you.

PRESIDING MEMBER PFANNENSTIEL: Thank you, good points.

Other questions?

MR. CALWELL: Commissioner, this is Chris Calwell. I wondered if, Paul Bendt, I know you've looked at this inductively charged issue a little bit. Is there anything you want to put in the record on that?

DR. BENDT: We have looked at the inductively charged toothbrushes. And Philips is correct, that they are rather low in efficiency, but they are also at that very low end of the battery energy capacity; and they are at a level where the efficiency standard would allow rather inefficient products to pass.

Based on what I've seen in the lab, I think there are electric toothbrushes that would already pass the particular standards like we're looking at.

So I don't think there was an issue there. There may be some particularly inefficient toothbrushes that don't pass. There are certainly ones out there that will pass the standards we propose.

PRESIDING MEMBER PFANNENSTIEL: Thank

you. Go ahead. We have a question.

MR. STRAIT: I don't have a question so much as a comment if I'm allowed to speak. I tend to agree with the previous speaker -- oh, this is Peter Strait, I work for the CEC, I'm speaking again -- but I reach a very different conclusion.

Honestly, I do not think that making a distinction between frequently charged and infrequently charged items really would do much, would have much value for us because so much of it is going to come down to personal use preferences.

I know that I recently purchased a cordless mouse for my computer that has a charging station, and most of the time it's going to sit there, even though I use it on a daily basis -- it's frequently used. But most of the time it's still going to sit there eight hours a day I'm asleep, eight hours a day I'm at work. And also, sometimes I forget to put it back on the station; it'll sit next to the computer and not be charged.

So, I think there's so much individual variability in how people even approach the same appliance, much less between the appliances, themselves, that making that kind of a distinction would only serve to make the regulations more

confusing when we go to implement them.

Having a simple standard that if it's a battery charger it has to meet this threshold in one aspect of it, and this threshold in another aspect of it would probably be the best approach.

I also, when he mentioned the example of the cordless toothbrush the thing that popped into my mind is that I do have a hairdryer sitting right next to the sink. And those seem to be acceptable for use in that kind of an environment. So I'm not sure what the distinction would be for an electric toothbrush that would make it something that needs to be excluded.

Thank you very much.

PRESIDING MEMBER PFANNENSTIEL: Thank you. Other points, other questions?

MR. MORRIS: Madam Chairperson, this is Wayne Morris. May I speak?

PRESIDING MEMBER PFANNENSTIEL: Yes, please.

MR. MORRIS: Thank you very much. This is Wayne Morris with the Association of Home Appliance Manufacturers and we represent manufacturers of portable and floor care appliances, several of which are cordless and

rechargeable, and also use battery chargers.

Thank you for the opportunity to comment; and especially the webcast and phone access for those of us unable to travel.

I want to echo the thoughts that Larry Albert has presented representing the Power Tools Institute. While there are some differences, the applicant type battery chargers are very similar to many of those used in the residential power tools market.

We know that the CEC has a Title 20 regulation in place that presently includes several types of battery chargers. For that reason it is important that I believe we consider the energy savings potential, the issue that Dr. Bendt brought up, as a baseline or possibly use the July 2, 2008 situation after tier two begins.

AHAM has been very involved in the development of test procedures, data collection and development of these regulations over many years. We'd like to continue that with this rulemaking on battery chargers.

While appliance battery chargers may not make up a majority of the products under this scope, in fact, according to the slides that we

saw from ECOS Consulting, they make up a very small minority of the products, they nevertheless do represent an important segment not only to our industry, but also to consumers.

We'd like to build on the work that PG&E and ECOS Consulting has done on the test procedure. And work together with many other stakeholders to develop a regulation that works for California, that works for the industry, and will -- work for the regulatory agencies and other jurisdictions.

This is a unique opportunity to have the lead, not only in the United States, but basically to the world, in development of this growing product category.

We'd like to thank the CEC, and we would ask that the appliance standards committee allow the staff of the CEC to set up a series of meetings with industry and other stakeholders to review a regulatory mechanism to address the appliance type battery chargers.

We will be glad to provide more specific directions in our written communications. Thank you.

PRESIDING MEMBER PFANNENSTIEL: Thank

you, Mr. Morris.

Any further comment on anything covered today, anything on the appliance standards?

I want to thank everyone who is here for your participation, your input. At some point Commissioner Rosenfeld and I will need to make some decisions about what goes into the next round of Title 20 standards. But fortunately, that day is somewhat in the future. We're just sort of starting the process.

And we're going to call on all of you, all of you here, all of you on the phone and probably others who weren't in the room today for help and guidance and information and insights and analysis as we go forward.

So, any further comments from the dais? Art?

ASSOCIATE MEMBER ROSENFELD: No, I just say we have a big job and we need lots of help. And, you're right.

PRESIDING MEMBER PFANNENSTIEL: Tim?

MR. TUTT: I just wanted to once again mention the January 30th date for providing detailed proposals or templates to us.

I don't know legally -- I'm pretty sure

legally that doesn't mean that we couldn't look at some proposal that came after that date, but we're looking to phase based on the information we get by the end of January at the very least.

PRESIDING MEMBER PFANNENSTIEL: Thank you all for being here. We'll be adjourned.

(Whereupon, at 4:45 p.m. the Committee Workshop was adjourned.)

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CERTIFICATE OF REPORTER

I, PETER PETTY, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Commission 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 30th day of January, 2008.