BEFORE THE
CALIFORNIA ENERGY COMMISSION (CEC)

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| In the matter of | ) | |
| | ) | Docket No. 12-AAER-2A |
| Efficiency Rulemaking | ) | |
| | ) | |

**STAFF WORKSHOP**
**2012-2013 APPLIANCE EFFICIENCY RULEMAKING**

California Energy Commission
Hearing Room A
1516 9th Street
Sacramento, California

Wednesday, May 29, 2013
9:00 A.M.

Reported by:
Kent Odell

APPEARANCES

COMMISSIONERS

Andrew McAllister, Lead Commissioner IEPR

STAFF

Ken Rider
Josh Butzbaugh
Harinder Singh
Peter Strait

Also Present (* present via telephone)

Shahid Sheikh, Intel, Representing ITI TechNet
Doug Johnson, Consumer Electronics Association
Pierre Delforge, Natural Resources Defense Council
Donna Sadowy, AMD
Nate Dewart, Energy Solutions, representing CA IOUs
*Lewis Hobson, Hewlett-Packard
*Vojin Zivojnovic, Aggios
Mark Hollenbeck, Hewlett-Packard, representing TechNet
Tony Brunello, Green Technology Leadership Group (GTLG)
Bijit Kundu, Energy Solutions, representing CA IOUs
*Mark Sharp, Panasonic
Clancy Donnelly, Ecova, representing CA IOUs
Noah Horowitz, Natural Resources Defense Council (NRDC)
*Bill Schindler, Panasonic
Mike Warnecke, Entertainment Software Association
*Dennis Lettva (ph), UL
Forest Kaser, Energy Solutions, representing CA IOUs
Tim Callahan, Microsoft
Gregg Hardy, Ecova, representing CA IOUs
Steve Dulac, DIRECTV
*Adam Goldberg
*Derek Okada
Charlie Stevens, Northwest Efficiency Alliance
Gary Fernstrom, representing PG&E
John Clinger, ENERGY STAR

INDEX


| | Page |
|---|---|
| Opening Remarks | |
| Commissioner Andrew McAllister, Ph.D., Energy Efficiency Lead Commissioner | 4 |
| Introduction | |
| Harinder Singh | 6 |
| Discussion on submitting proposals - Ken Rider | |
| Staff Presentation: Computer - Ken Rider | 8 |
| Discussion and Comments | 11, 58 |
| Staff Presentation: Displays - Josh Butzbaugh | 63 |
| Discussions and Comments | 64, 88 |
| Lunch | 92 |
| Staff Presentation: Game Consoles - Josh Butzbaugh | 93 |
| Discussion and Comments | 111 |
| Staff Presentation: Set-Top Boxes - Ken Rider | 114 |
| Discussion and Comments | 118, 122, 154 |
| Staff Presentation: Network Equipment - Ken Rider | 163 |
| Discussion and Comments | 167, 185 |
| Closing/Next Steps - Ken Rider | 188 |
| Adjournment | 189 |
| Reporter's Certificate | 190 |
| Transcriber's Certificate | 191 |

1 P R O C E E D I N G S

2 MAY 29, 2013 9:15 A.M.

3 COMMISSIONER MCALLISTER: All right. My name is
4 Andrew McAllister; I'm the Lead Commissioner on Energy
5 Efficiency here at the Commission, which includes
6 obviously of course what we're doing today under
7 California Title 20 Appliance Efficiency Standards.
8 I want to thank you all for coming. I see a lot
9 of familiar faces in the audience, but some not so
10 familiar, and those of you on the Web, as well, I really
11 appreciate your participation, I know it's not easy, and
12 we try to make it as easy as we can, but particularly if
13 you don't live in Sacramento and you've made the trek out,
14 thank you very very much because it's extremely important
15 that we have broad participation in this proceeding today,
16 in particular. We try to facilitate that in all of our
17 proceedings, but this one is near and dear to my heart and
18 I think extremely important for California as a state and
19 historically have been one of the Energy Commission's
20 bread and butter activities, along with Building
21 Standards. And I think there continue to be a lot of good
22 opportunities in the appliance realm for cost-effective
23 energy savings.
24 And this time around we're really trying our best
25 and bending over backwards, I would say, and that is at

all levels, to encourage, facilitate, promote, do outreach, this activity so that we can get the broadest participation possible. You know, we have a fairly -- we have an information-based process here at the Commission and we need good information to make good policy decisions. And so I think it's to everybody's benefit to submit data; if there are needs for confidentiality support, we can totally do that, we can absolutely do that, and I think information from industry, from advocates, from other stakeholders, utilities, other industry groups, I think is just extremely critical to make the process work and to really end up with a solid result that has some consensus around it. And the alternatives, I think, are sort of less productive and less pretty in some ways, and I think we'd all like to have a process that gets us to a commonly acceptable end result.

So I'm really encouraging all of you to submit the best data that you have across the board, I think that's really where we've tried to arrange the process, to encourage that and to facilitate that. So, again, thank you very very much for coming.

We have a really packed agenda today. Obviously there's a lot of consumer electronics that we're looking at in the process here and want to make sure that

everybody has an opportunity to speak and make clear the process going forward so that you can all participate as integrally and completely as possible. So thank you again for coming, I really appreciate it.

I'm going to be in and out today, this is a staff workshop, not a Lead Commissioner workshop, so I've got to juggle a few things, but I'm going to be listening intently while I am here, and I'll pass it back to staff. I want to actually thank staff, Harinder, Josh, and Ken in particular, but all the Appliance staff for putting all this together and the work they've done so far and will continue to do on this proceeding, extremely capable and very important work. So thank you very much. And I'll pass it back to Harinder.

MR. SINGH: Thank you, Commissioner. Good morning. My name is Harinder Singh. I am an Electrical Engineer with the Appliance Efficiency Program.

Before we start, just a few housekeeping items before we begin. So for those of you not familiar with this building, the closest restrooms are located on the left side of this door as you go out, and there is a snack bar on the second floor under the white awning that is upstairs. Lastly, in the event of an emergency and the building is evacuated, please follow our employees to the appropriate exits. We will reconvene at the Roosevelt

1 Park located diagonally across the street from this
2 building. Please proceed calmly and quickly, again,
3 following the employees with whom you are meeting to
4 safely exit the building. Thank you.
5 Today, you know, this workshop is about the
6 consumer electronics and let me give you a little bit of
7 history on this, how we started. We conducted a scoping
8 workshop in August 2011 and after that, in March 2012, the
9 Commission adopted Order Instituting Rulemaking and that
10 OIR was split in three phases, and we are in the first
11 phase of this OIR.
12 In March of 2013 this year, we issued information
13 to participate to receive comments, information and data
14 from the stakeholders. And on May 9th, we received a lot
15 of comments because that was the deadline, data and
16 information. And we decided to conduct a series of
17 workshops to discuss the data and the information we
18 received.
19 So today's topics are Consumer Electronics, these
20 include Computers, Consumer Displays, Set-Top Boxes,
21 Network devices, and Game Consoles.
22 And the next step after this workshop, staff has
23 prepared a proposal template, we will issue that proposal
24 template on June 10th, and we will ask for proposals.
25 That template is just a sample of how to submit the

information or proposal. So the request for proposal, the last date would be July 25th. So after that, staff will evaluate all the proposals and look into drafting standards or developing standards.

With that, I will introduce Ken Rider, who is the first speaker. He is going to present Computers and this is his topic. So, Ken, please.

MR. RIDER: As Harinder said, I'm Ken Rider. I want to thank everyone for coming out here today, the computer industry, IOUs, and NGOs.

Today we're going to talk about computers. This is the computer presentation. We're going to go through some of the main information received in response to the ITP. And the purpose of this ITP and this presentation is to kind of get at the stakeholder reaction to some of the information and data submitted. And we've asked for information on costs, we've asked for information on Operations and Modes, and we've actually got pretty good responses. We've got a lot of good data into our record from stakeholders. These are some of the main stakeholders who submitted data to us.

So one of the main points, one of the things we asked about is: what is a computer? A lot of folks said that a computer should be defined using existing definitions similar to ones used in ENERGY STAR version 5

1 and the Draft ENERGY STAR version 6.

2 Comments also suggested that we should really
3 focus in on the higher volume computers such as desktops
4 and laptop form factors. It's very critical for
5 stakeholders to well define the scope of what a computer
6 is when they issue these proposals. We're going into a
7 Request for Proposal phase immediately following this ITP,
8 and we'll be asking stakeholders to submit ideas on how
9 the Energy Commission can save energy in computers. And
10 so it's extremely critical that you bound what you mean by
11 a computer when you submit that proposal.

12 So another very critical piece of information
13 about the computer industry that we asked about was
14 shipments and sales in the U.S. and California. We got
15 some responses from CEA, IOUs and NRDC, and I've placed
16 some of the figures that they submitted to us on this
17 slide.

18 And so the way I want to run this, really this
19 workshop is about getting even more feedback from the
20 stakeholders; I want to do as little speaking as possible
21 so that way we can maximize the time that folks can
22 comment on the information received for the ITP. So what
23 I've done is I've created some discussion points to talk
24 about for each of the main critical points of information
25 on computers. I'm going to introduce those discussion

1 points and, rather than going through each one of these in
2 sequence, I'm going to introduce all three of them so that
3 folks don't have to continually go back and forth to the
4 podium to comment.
5 MR. STRAIT: Sorry, one second folks.
6 MR. RIDER: Thanks, Peter. So I'm going to
7 introduce these topics and then open it up to the floor,
8 to the stakeholders. I'm first going to open it up to
9 folks in the room, and then I will open up to folks who
10 are participating through the Internet and through the
11 phone.
12 So in terms of shipment information for
13 computers, I thought we might talk about some of these
14 points, you may also bring up other points that you may
15 want to for each of these topics -- so GDP is Gross
16 Domestic Product: Is GDP scaling superior to population
17 scaling for computers due to its prevalence in the
18 commercial sector? I believe the IOUs in their
19 information scaled the national figures to California
20 figures using GDP; are desktop and laptop shipments
21 decreasing? There were some indications in the data
22 submitted to us that these shipments are decreasing over
23 time; are there concerns with either the CEA or the
24 IOU/NRDC estimates? And those estimates are on this
25 slide, 132 million laptops installed in the U.S., 101

1 million desktops in CEA's figure, and the IOU/NRDC figures
2 are 66.5 million shipments, so that would be somewhere to
3 sales. And so I'm going to open it up now to anyone who
4 has any comment, concerns about these figures, or wishes
5 to talk about any of the discussion items I brought up.
6 Yes, go ahead and -- good point -- go ahead and approach
7 the podium if there is no one there; if you could, if
8 someone is at the podium, please line up across the aisle
9 behind the podium.
10 MR. SHEIKH: Okay. So this is Shahid Sheikh.
11 I'm from Intel. I'm representing ITI TechNet here. So we
12 don't have a long answer on this, but our thinking was
13 that population scaling and maybe the best thing in the
14 first order, but GDP scaling could also be considered as a
15 secondary. Commercial sector shipments are a function of
16 enterprise, or IT replacement cycle, which is based on the
17 corporate IT policies, so it varies by corporations and
18 it's also that economic environment also plays a role in
19 terms of impact on replacement cycles in corporations. So
20 we've seen company policies, IT policies, vary and a lot
21 of it differed by their IT policy, as well as economic
22 environment.
23 In terms of your second question, the desktop and
24 laptop shipments decreasing, they may or may not as we are
25 seeing the emergence of new form factors and usages that

are on the horizon, and general economic indicators are improving, so we get a better sense of that by the end of this year and see that year over year, changes.

Any concerns on the estimates, you know, we essentially rely on the third party industry analyst estimates, Gardner-IDC, etc., so if these numbers reflect those estimates, then we tend to rely on that. Thank you.

MR. RIDER: Thanks, Shahid. Go ahead, Doug.

MR. JOHNSON: Good morning. Doug Johnson with the Consumer Electronics Association. Just to emphasize the CEA data and the question of the vintage of the data there, it's obvious that this is a three-year-old study at this point, we focused on 2010 model year products in that last energy use survey of the Consumer Electronics Industry. Our plan, when we first did this survey back in 2006-2007 was to update this about every three years and we're on cycle with that and our plan is to begin that update process later this year, during which we'll focus on the 2013 model year. So that will address the energy use trends.

And as far as the market penetration and shipment data, we do have much more recent reports on that which I think we referenced in our comments submitted to the CEC recently. Some of those reports are for sale and I think the message to the CEC was that, if this data is of

1 interest, then we can talk about how best to share that;
2 we didn't necessary want to post something that was
3 otherwise for sale to non-members. Thank you.
4 MR. RIDER: Thank you, Doug. All right, seeing
5 no one -- oh, go ahead, Pierre.
6 MR. DELFORGE: Pierre Delforge, NRDC. On the GDP
7 scaling factor, we think that in the commercial sector
8 it's more driven by economic activity and, given that the
9 commercial factor is at least, you know, over half of the
10 installed base, it is a significant factor in this
11 equation, even on the consumer that we don't have data,
12 you know, we can assume that in California there's
13 probably a slightly higher penetration of computers than
14 in the average of the U.S. So we think that it would be
15 probably slightly more accurate and more representative of
16 the real world number for using GDP versus population.
17 On the second one, on desktops and laptops, our
18 estimates are based on IDC and, if you look at IDC
19 numbers, they actually are only decreasing very slowly, so
20 it's not a major decrease, it's pretty much stable. And
21 if you look, the desktop is decreasing -- IDC predicted --
22 the latest numbers by IDC project continued increase,
23 slight increase for notebooks by 2017, and a slight
24 decrease for desktops, overall a very slight decrease. So
25 we consider modes to be stable than to be a major decrease

in the sales, and therefore the installed base.

And on the third one, you know, like Shahid said, we try to use the latest data from the analysts, and we want to allow in with whatever data is available from that perspective. Thank you.

MR. RIDER: Thank you. So I'm going to attempt to unmute the lines here and see if there are any comments on the phone. If you've got a comment, go ahead and start talking. Anybody have any comments on the phone? Going once? Going twice. All right, I'm going to move on to the next topic.

So the next area for discussion is Modes of Operation and these are the different ways the computer functions. We received comments from multiple stakeholders regarding what the modes of operation of a computer are. They were actually fairly aligned. They suggested using ENERGY STAR's definitions for the Modes. ENERGY STAR has multiple modes defined, including an active state; active state includes idle states, and within idle states there is a long idle, so that means someone hasn't used the computer for quite some time, it's been sitting there, but it's still on, the other is short idle, which means someone has stopped using the computer just briefly. ENERGY STAR also defines sleep mode and an off mode, and it's notable that off mode is not mechanical

1 off, but rather soft off.

2 So: Are there any missing important modes to
3 properly characterize power scaling? One of the major
4 opportunities in several of the consumer electronic
5 categories is power scaling, so do we have enough states
6 here to really get an idea of how well a computer power
7 scales? Also, the ITI/TechNet comment states that the
8 newer computers are implementing alternate states to
9 traditional ACPI states, and the Energy Commission, at
10 least, is interested in knowing how this is affecting the
11 market and energy consumption in computers. So, you know,
12 traditional ACPI states are S states; apparently the ITI
13 comment referenced some Windows 8 machines that do not
14 have several of those states. So any comments on either
15 of these two discussion points or Modes of Operation in
16 general, I'm going to open it back up to the stakeholders.

17 MR. SHEIKH: Shahid again from Intel,
18 representing ITI/TechNet here. Regarding the first
19 question, are there any missing important modes to
20 properly characterize power scaling? We think you got
21 them all covered, except one note to make here is that
22 active mode in the true sense where you're looking at a
23 work-related modal power, that has not been traditionally
24 part of the ENERGY STAR TEC compilations because that
25 requires setting up a benchmarking and, since it's not

1 significant, that has not been included in the ENERGY STAR
2 framework, and that's something we continue to advocate.
3 And one other point is these modes are used for
4 establishing the TEC which is a Typical Energy Consumption
5 at the system level, and the goal should be to use just
6 for that, but not establishing any modal power targets, so
7 like what we have seen in one or two other jurisdictions.
8 Regarding your second question, what we are
9 seeing is new usages on the horizon; an example would be
10 always on/always connected. These usages essentially in
11 some cases would lack the discrete sleep mode. However,
12 these are not expected to be mainstream within the CEC's
13 rulemaking horizon, so while these usages should be
14 addressed, and what we have been working with the EP and
15 ENERGY STAR, as well, but the focus should continue be on
16 TEC methodology for CEC computer specifications.
17 MR. RIDER: Thank you. Shahid, can I ask you a
18 question? You were saying, just to be clear, you do not
19 -- you advocate not benchmarking? You advocate the same
20 approach as ENERGY STAR --
21 MR. SHEIKH: Right.
22 MR. RIDER: -- in not (indiscernible)?
23 MR. SHEIKH: Right. Benchmarking activity is a
24 very long drawn activity and, based on the study that was
25 done in the last couple years, that error generated due to

not considering active mode was only 2-5 percent, but to establish the benchmarks and run those benchmarks is a much long drawn activity, so, you know, based on the data it suggested that the active mode contribution for the majority of profile that was established continues to be very small.

MR. RIDER: Thank you for the clarification. Go ahead, Pierre.

MR. DELFORGE: Pierre Delforge, NRDC. I'd like to come back to this active mode question. And we've done some anecdotal testing that shows that the active mode, so when you're using the computer actively over the whole day of work, it's somewhere between 20-60 percent higher than the ENERGY STAR TEC estimates, and that's the ENERGY STAR version 6, which is even higher than version 5. So I think what this indicates is that, as computers are becoming more capable of scaling power between idle and active, the difference is getting bigger and that ignoring the active mode underestimates significantly the real world energy use of computers. This being said, I agree with Shahid that we don't necessarily want to use a benchmark because of the complexity of using that, and we'll put that in our proposal in the next phase, but we support using the ENERGY STAR test method; however, we think it's important to increase or to use a factor to

1 scale the estimate of energy use, and therefore energy
2 savings and cost-effectiveness to account for active use
3 and not just to take the ENERGY STAR TEC as the right
4 estimate for computer energy use in the real world. Thank
5 you.
6 MS. SADOWY: Donna Sadowy with AMD. I'm also one
7 of two Technical Managers for the IEC 6623 on Computer
8 Measurement Standard within IEC TEC100. The 6623 Standard
9 found that idle was an effective proxy for active mode.
10 This was confirmed through a profile study, albeit that
11 profile study is a few years old at this point, but I
12 would recommend strongly that we would need that type of
13 data, that type of broad profile study data. I think
14 there's some work going on now to try to update and
15 understand what today's duty cycle and power usage are,
16 but I would really be concerned if CEC were to regulate
17 based on anecdotal evidence, you know, measurement of one
18 PC; that would be of significant concern.
19 MR. RIDER: Right, Donna. Ms. Sadowy, can you --
20 is that data something that we should be reviewing -- a
21 study was conducted on 62623 and on some sort of duty
22 cycle; are you saying that that is too old and out of
23 date? Or should we be looking at that information?
24 MS. SADOWY: I think that -- I do not think -- my
25 initial take is that it's not out of date. I think it is

1 worth looking at perhaps some new applications like NRDC
2 suggested to confirm that. But we -- Intel is the other
3 Technical Manager on that standard and we would be happy
4 to work with you and share information.
5 MR. RIDER: Fantastic. Thank you. Please
6 approach the podium. Thank you.
7 MR. SHEIKH: Just to clarify, Ken, on your point
8 about the study. To establish these different duty
9 cycles, and we're probably going to have a question on
10 duty cycles later, you really need to do a large study,
11 what we call a majority profile study, to really
12 understand about the duty cycles and the energy modes, all
13 right. So in absence of a large study, it's very
14 difficult to take a look at small usages or usages in a
15 given region to establish that as a framework for setting
16 up -- establishing different modes for California. So I
17 think we should stay away from looking at very small
18 studies. So, as Donna mentioned, the right way to
19 approach that is to the standard that has been
20 established, and if the standard gets outdated, then the
21 study should be performed to update it, and that is a
22 standard that we are advocating to harmonize to for test
23 methodology, to IEC 62623.
24 MR. RIDER: Thank you, Shahid. And I think we
25 will be getting more into duty cycles later on in this

presentation.

Peter, if you wouldn't mind -- or should we use the hand raising methodology maybe for this? Is everyone -- do we have a lot of call-in users? Okay. All right, so I suppose just open the line, then. For anybody that's on the phone, we're going to open up the line and provide an opportunity to comment on Modes of Operation.

MR. HOBSON: Can you hear me?

MR. RIDER: Yes, I can hear you.

MR. HOBSON: I just wanted to make one clarification. I believe it was stated that the (indiscernible) doesn't support the traditional ACPI modes of operation and that's not true. (Indiscernible) machine registered itself as supporting connected standby, then it always doesn't support sleep, expecting the low powered state to a current idle. If a machine doesn't support itself as supporting connected standby, then the (indiscernible).

MR. RIDER: Well, thank you for that clarification. Anybody else on the phone? It looks like you had a question maybe, Bob? Nope. All right, can you close the lines? Great. Oh, go ahead, Nate.

MR. DEWART: Nate Dewart from Energy Solutions on behalf of the IOUs. I just wanted to add support of use of or accommodating for active mode, active state, given

1 that it is part of the operation of a computer. Somehow
2 as we're, you know, working through the data just to
3 assess it and given that computers are in active mode at
4 least some percentage of the time, so accommodating for
5 that accordingly.
6 MR. RIDER: Thanks. All right, so moving on to
7 Duty Cycle, we received several estimates of what a
8 computer duty cycle might be. ENERGY STAR in its
9 specification actually uses an assumed duty cycle to
10 arrive at the TEC that Shahid was discussing. And so we
11 received that duty cycle in response to the ITP. Also,
12 the CEA report had not only one assumed duty cycle, but a
13 literature search of some other duty cycles, as well, and
14 some duty cycle assumptions over time. And I've cited the
15 tables there if folks want to look up what those were.
16 And also, the IOUs suggested, and I think Shahid
17 just suggested, as well, that a new duty cycle estimate is
18 needed. So as discussion, I'd like to talk about which
19 duty cycle best represents average real world use for
20 computers in the market today. Is, in fact, a new set of
21 duty cycles needed? And if so, is a new set of duty
22 cycles needed for both residential and commercial
23 computers? Or are there some assumptions that we can make
24 in the commercial space as it tends to be less variable?
25 Anyway, I would just like to open that up for discussion.

1 Are there expected features or trends that may
2 significantly change the duty cycle of computers?
3 So earlier, I think we heard that there are new
4 form factors coming out all the time for computers, even
5 the traditional ones, and the usages are slightly changing
6 over time. Are there any really big changes expected in
7 this area? So I'm going to open it up again to folks in
8 the room. I think Nate stood up, Shahid, but --
9 MR. DEWART: So I just wanted to make a
10 clarification again. Nate Dewart, Energy Solutions on
11 behalf of the IOUs. Just a clarification in terms of what
12 we're proposing. We proposed the use of one duty cycle
13 for both residential and commercial, just as ENERGY STAR
14 does, as well as the development of a duty cycle that's
15 based on the full spectrum of existing studies that Shahid
16 mentioned, rather than just the two that were used to
17 develop the ENERGY STAR duty cycle, the 6.0 duty cycle, so
18 that was the ECMA-383 and the Microsoft transition 2008,
19 our point in submitting the other studies was just to
20 point out that there are other studies out there and all
21 should be considered. And NRDC and NEEA, during the
22 ENERGY STAR process, proposed a duty cycle based on these
23 studies, and we intend to recommend something similar in
24 our Standards proposal.
25 MR. RIDER: So just to make sure I understand

1 correctly, you're saying a new duty cycle needs to be
2 assembled using existing studies and data, and not --
3 MR. DEWART: Given the absence of additional
4 study, I think it makes sense to -- since ENERGY STAR was
5 based on two studies, just pointing out that there are
6 other studies to consider as we develop a duty cycle.
7 MR. RIDER: Great. Thank you.
8 MR. DEWART: Sure.
9 MR. SHEIKH: Shahid representing ITI/TechNet. So
10 duty cycle discussion is very long and we can spend a lot
11 of time on this, but, you know, duty cycle is a function
12 of the computer and how the computer gets used. What I
13 use a computer at home versus how I use a computer at
14 work, my usage may be very different, and hence my duty
15 cycle would be very different. So the whole idea of
16 developing -- so we expect there are going to be --
17 there's a majority duty cycle profile and there are going
18 to be a whole bunch of minority duty cycle profiles out
19 there, but the idea is to have one duty cycle and at one
20 time to establish your TEC methodology. If you have too
21 many duty cycles at a given time, then it's very difficult
22 for -- it's very confusing for consumers and for
23 regulators, as well as it's very difficult for system
24 makers to design their product. So the agreement, the
25 first agreement has to be, what is the real majority

1 profile? And so there was an opportunity, as Donna was
2 mentioning when IEC 62623 was established, where prior to
3 that ECMA-383 standard was established, and within that
4 there was an opportunity to conduct a study, a large
5 study. And it was opened up for anyone to participate and
6 contribute in establishing the right majority profile and
7 duty cycles. And there should be an opportunity in the
8 future, you know, should the stakeholders feel that
9 there's a big change from the current duty cycle and that
10 should be changed, that to establish it through the right
11 standards process, to establish a new profile. And
12 stakeholders should contribute in that so that one
13 representative majority profile could be established.
14 So given that that has yet to happen, that we
15 should essentially look at how ENERGY STAR duty cycle have
16 been established. Now, within ENERGY STAR, essentially
17 we're looking at two duty cycles, one is established for
18 the ENERGY STAR version 5.2, which has been pretty much in
19 production now; and then the new duty cycles which is
20 ENERGY STAR version 6 have been updated based on the ECMA-
21 383 study. Now, the difference is the ENERGY STAR version
22 6 specification is still not final, it's being finalized,
23 and by the time it goes into production that's going to be
24 another perhaps one year out. So we advocate using the
25 established ENERGY STAR version 5.2 duty cycles for any

1 MEPS-based programs, globally. ENERGY STAR is a voluntary
2 program and it still has to try out the new duty cycles to
3 make sure everything works. So we essentially advocate
4 use of the duty cycles that are being implemented in
5 Europe and Australia and Korea and elsewhere with perhaps
6 some changes on discrete graphics methodology and some
7 exceptions on categories, etc., but essentially what we
8 are advocating is to use the 5.2 duty cycles for any
9 mandatory programs.
10 As far as should it be based on residential and
11 commercial computers? Yes, it should be. To date, the
12 studies have been largely based on the enterprise or
13 commercial computers, but in the future if the consumer
14 computers are playing a big role because of the majority
15 of the shipments could be consumer, to establish profile
16 based on the consumer computers. But establishing profile
17 based on consumer computers is also very difficult because
18 you really have to do some statistical analyses and target
19 consumer products to be able to do that, so that is a
20 challenge that we'll all be facing. But we still advocate
21 a single majority profile based on either corporate,
22 consumer, or a mix of corporate/consumer that can be
23 established in the future.
24 The second question, are there expected features
25 or trends that may significantly change the duty cycle of

1 computers? There may be. For example, the all is on, all
2 is connected, or other usages may change the duty cycle,
3 but again the focus should be on the majority profile.
4 And if these are niche applications and are not mainstream
5 yet, we should continue to focus on the majority profile
6 for most of the shipping products. Thank you.
7 MS. SADOWY: Donna Sadowy with AMD. In regards
8 to trends, AMD recently commissioned a study of form
9 factors and how consumers today are using form factors,
10 and I'm quoting from memory, but what I remember is about
11 40 percent of consumers are now using this blended type of
12 usage where it's smartphones, it's tablets, it's laptops,
13 and it's desktops, and our study just projects that to
14 increase greatly going forward. So I think if we're
15 thinking of changing, you know, duty cycles or information
16 from what already has been tested and shown, you know,
17 that there is some validity to it, and I think there's a
18 lot of complexity being introduced to the market with the
19 new form factors coming in that, you know, we would really
20 need to understand how all these different form factors
21 are being used and what time they're being used by
22 consumers.
23 MR. RIDER: Thank you. And I don't know if I've
24 made this clear yet, but where we come out at the end of
25 today is not -- it's not closed, it's not the end of the

1 story, you know. This process is flexible enough that we
2 will continue to consider new studies, new information,
3 etc. along each and every stage of the process, so I just
4 wanted to make sure I made that clear to everybody in the
5 room. Go ahead, Pierre.
6 MR. DELFORGE: Pierre Delforge, NRDC. So we
7 agree ideally that we would need a full methodological
8 profile to study a new one to reflect new usages of
9 computers given that the previous one is several years
10 old; however, we don't think that we have the time within
11 the CEC process to do a full study, and in the meantime we
12 have, as Nate mentioned, a number of existing studies, and
13 we think that it's important to reflect all these
14 different studies in the duty cycle which is going to be
15 used by CEC. One particular factor is that the current
16 study, the current profile which is used by 62623, is
17 based on two studies, one by ITI, I believe, for ECMA, and
18 that was only on a few enterprise companies and, you know,
19 I fully understand why nobody else came forward, but the
20 fact is that in the enterprise sector, in particular, a
21 lot of companies tend to leave their computers on all the
22 time to disable power management and I don't believe this
23 was represented in the study, and therefore not in the
24 duty cycle. I think it's important, we have other studies
25 -- we have it on the next slide, I think by Chetty, et al.

which show that in some enterprise settings we have much higher active modes, and I think it's important to reflect that.

We also, to respond to the version of ENERGY STAR version 5 versus version 6, we think that version 6 is much more representative of real world and that's why it was a great advantage of ENERGY STAR, and I think it's important to reflect that in the standard, even though there's still some uncertainty and we realize that, and we actually think that, you know, it would be a better proxy, even though we think ideally we would like to take into account the other studies, but at a minimum base it on Energy Star version 6. And there's other reasons, and I don't think that's the topic of this slide here, but maybe we can discuss it later, why we think that version 6 framework, ENERGY STAR version 6 framework, is much better suited than the version 5 framework from the standard setting perspective, not just duty cycle.

MR. RIDER: Right, and then we certainly will be discussing standards at a later date. I think today we're focused on the data and the information and the background, and we'll certainly be getting to proposals and that kind of thing later on. Thank you very much for your comment.

MR. DELFORGE: Thanks.

1 MR. RIDER: Peter, if you could, I think it's
2 time to open up the phone. Anybody on the phone or on the
3 Internet, we're going to open it up for you to make any --
4 to add anything to this discussion on duty cycle.
5 COMMISSIONER MCALLISTER: You folks on the phone,
6 if you could mute yourself if you're transmitting some
7 background noise that would be very helpful. We can hear
8 everything in your background here in the room.
9 MR. RIDER: Going once, going twice. Anybody on
10 the phone?
11 MR. HOBSON: Okay, once again this is Lewis
12 Hobson, Hewlett-Packard. One feature that wasn't
13 mentioned that was designed specifically to change the
14 duty cycle of computers is NET Proxy -- Network Proxy --
15 that came out of ECMA-393 a couple years back. And what
16 it was designed to do was to enable machines to sleep far
17 more reliably on the network because if machines could not
18 sleep reliably on the network, and especially enterprise,
19 the only other thing you could do was leave them on all
20 the time when your IT Departments can reach them. And so
21 what the NIC Proxy does is allow the machine, even though
22 they're still asleep, the NIC has the ability to proxy for
23 certain requests like AGS (ph) resolution and neighbor
24 search that prevent machines from getting lost on the
25 network. And that is having some effect. What the first

1 OS has supported is Windows 7, and the last change on the
2 first (indiscernible) support if for coming out and this
3 was enough of a change to get the U.S. Air Force to start
4 putting their machines to sleep, so this is something
5 that's out there that it still gains the momentum and it
6 was exactly designed to change the duty cycle, i.e., to
7 keep machines sleeping longer and more reliably.
8 MR. RIDER: Thank you, Lewis.
9 COMMISSIONER MCALLISTER: Lewis, can I follow-up
10 and ask you -- this is Commissioner McAllister -- can I
11 ask you, well, whether you are participating in the
12 rulemaking, submitting comments and getting things on the
13 record, other than this workshop? I mean, it sounds like
14 you have some good perspective that we'd like to get
15 involved in these discussions going forward if you're not
16 already, so I would just encourage you to offer some of
17 these concrete developments on the record here so we can
18 take them into account.
19 MR. HOBSON: Actually, some of what ITE sent back
20 in response to CEC, I wrote some of that, so I am
21 proactively involved in this, I just wasn't able to travel
22 because of a conflict.
23 COMMISSIONER MCALLISTER: Great, great. I really
24 appreciate it, so that's good news. Thank you.
25 MR. RIDER: All right. And in case anyone was a

1 little lost there, a NIC is a Network Interface Card.
2 Okay, so anyone else on the phone? Any other comments?
3 If you could mute the lines? Although International
4 Strategies is interesting…we're going to go ahead and move
5 on to the next topic. Oh, this was -- just for reference,
6 this was some of the various duty cycles that were
7 presented in the IOU comment, there's a nice table that
8 summarizes some of the things that we were just talking
9 about like ECMA-383.
10 So I'd like to bring the conversation to Power
11 Management. So there were several -- there are actually
12 maybe half a dozen questions in the presentation I gave on
13 computers, asking for information from stakeholders on
14 power management.
15 ENERGY STAR requires power management to be
16 enabled as a factory default setting, so anything that is
17 on that list presumably has a certain set of power
18 management. However, there are many studies that show
19 that there still is not 100 percent, or sometimes very
20 poor amounts of power management being enabled in the
21 workplace, or in homes. The CEA 2010 residential energy
22 consumption report put it at about 30 percent of computers
23 that have power management disabled, it's been turned off.
24 I'm not saying that that's how they were shipped, but that
25 was a figure for how they end up.

1 I believe the IOUs or NRDC also submitted -- I
2 think NRDC submitted the Minnesota study figures; there
3 were some other Enterprise studies, they all showed very
4 low amounts of power management enabling, sometimes below
5 50 percent.
6 The Energy Commission is always actively
7 researching power management enabling through UC Irvine's
8 Cow Plug. They're doing a study for us right now to get
9 an even better understanding about not only is power
10 management enabled, but why people disable it. And some
11 of these other studies, I believe, have some background on
12 why, as well, which is important to understand.
13 So for this discussion, I have a few items to
14 bring up. Do a large percentage of computers transition
15 from factory defaults to poor power management settings,
16 similar to what some of these studies suggest? Are people
17 having other experiences? How should the CEC interpret
18 these enabling rates relative to estimated duty cycle?
19 And I think Pierre was just discussing that, you know,
20 should we modify the duty cycle to take into account these
21 differences in power management? So I'll go ahead and
22 open it up to the room for discussion. Again, if you have
23 other comments on power management, feel free to make
24 those comments, as well.
25 MR. SHEIKH: Shahid again from Intel,

representing ITI/TechNet. So this has again been a lot of discussion on power management as of the last year and a half working with the CEC, so as we all know, most PCs shipped today have power management enabled as shipped, and commercial computers, enterprise, typically follows IT Power Management policies that may slightly vary from how it's shipped, and unlikely to disable power management, we don't see that much happening in the corporations.

Now, there's been a lot of talk about potentially large percentage of PCs getting power management disabled in California, but we haven't seen any concrete data. There's been a lot of discussion on it to prove that a large number of consumers disable power management. And ask Ken mentioned, that we are working and industry is participating working with CEC and UCI to understand just that, through a consumer behavioral survey that is currently under design and expected to be completed in the next nine months or so.

So how should the CEC look at these enabling rates relative to estimated duty cycles? So our thinking is we should first get the data to see if this is really a problem, and should the data suggest significant problems with power management settings, the focus should be on consumer education and potential incentives to reverse this behavior. So let's fix the power management

disabling problem. This is critical to energy efficiency for PCs, we all agree on that. The focus should be on fixing the problem and not making any changes to the duty cycle. Thank you.

MR. RIDER: Any other comments in the room? Peter, if you would? And again, folks, please mute your lines, we're about to unmute you, so if you could, keep it to a minimum with the rustling of -- that's better. Go ahead, if you're on the phone and you would like to make a comment, please go ahead and speak.

All right, it sounds like there's no one on the phone, so I'm going to go ahead and move on to the next subject, which is the Energy Consumption of Computers.

So again, thank you so much to everyone who participated. We received quite a bit of information on the energy consumption of current computers and also some trend information of how much they used to consume. The CEA 2010, again, that study, residential study, kind of shows energy consumption over time from 2006 to 2010. It projects increasing amounts of energy consumption at least over that time range from 2006 to 2010; obviously, it doesn't predict past its publication date, but that study showed a very large increase in energy from 2000 to 2010 largely because of a very large increase in the number of computers.

1 The IOUs, ITI and TechNet and NRDC, showed a
2 downward trend per unit energy consumption and that's
3 important to understand that. When I say "unit energy
4 consumption," I'm talking about a single computer, so in
5 terms of single computer, the energy use is going down.
6 When I was just talking about the CA study, I'm talking
7 about the aggregate energy consumption of all of the
8 computers, which incorporates things like the number of
9 computers and how long they're used, etc.
10 Also, NRDC provided some data and background
11 information that showed very large variation in the energy
12 consumption of computers in the marketplace, categorized
13 by similar features. In fact, there was one particularly
14 interesting case where, in the same category, there were
15 computers that used 150 kilowatt hours per year, and a
16 computer that used 750 kilowatt hours per year, and that's
17 a factor of five different, that's a very large variation
18 in energy consumption.
19 So I'd like to discuss will the growth in sales
20 -- and I think we may have already talked about this a
21 little bit earlier with the sales, but also usage --
22 continue to increase energy consumption? Or is it going
23 to decrease energy consumption? Are such large variations
24 in allowances necessary for programs such as ENERGY STAR?
25 And Pierre has corrected this, and maybe he can explain a

1 little bit more, I guess that ENERGY STAR allows 150
2 kilowatt hours to 750 kilowatt hours, it's just part of
3 the dataset that they were using to develop their
4 specification, but still there are a lot of very large
5 allowances and whatnot where, if you had a lot of
6 features, you could have a pretty large amount of
7 variation within that same product category, so
8 essentially very large, you know, factor of 2, factor of
9 3, kind of allowances necessary to accommodate either a
10 voluntary or mandatory standard. So I'm going to open it
11 up to folks in the room. Anything on energy consumption
12 or these two discussion points?
13 MR. DELFORGE: Pierre Delforge, NRDC. So just to
14 build on what you've just mentioned, Ken, on the number
15 750. So it was unclear in the NRDC comments, I apologize
16 for that, but this is not ENERGY STAR qualified product,
17 these are all the products in the ENERGY STAR dataset and
18 this particular 750 kilowatt hours per year computer is
19 the most energy consumptive computer in the dataset, which
20 is why this is here, it's definitely not qualified for
21 ENERGY STAR. That being said, it's interesting to note
22 that in the EU regulation, which is going into -- which is
23 about to be adopted and going into effect next year, their
24 current limits allow for computers up to 600 kilowatt
25 hours per year to qualify, or to comply with their

1 regulations. So it's still a very large range of energy
2 consumption, even in the EU Regulation as it is currently
3 or has been adopted.
4 I want to comment also on the trends. So, based
5 on the IDC numbers for sales and slight decline in sales
6 overall, and the also slightly downward trend in terms of
7 energy consumption on the unit basis, we expect energy
8 consumption of computers in aggregate to also slightly
9 decline, but I think what is important here is still going
10 to be, you know, are the projections still keep that in
11 the range of 7,000 to 8,000 gigawatt hours per year in
12 aggregate consumption, so it's not a major decline, and
13 it's still a huge opportunity for savings. I think what
14 is stable is probably a better characterization of that
15 energy trend, rather than declining. I think that's all I
16 wanted to say for now. Thank you.
17 MR. RIDER: Thanks, Pierre.
18 MR. SHEIKH: Shahid from Intel, also representing
19 ITI/TechNet. So on the question of energy consumption,
20 the computer energy consumption continues to improve year
21 over year. Regulation or no regulation, this is largely
22 due by innovation and market forces, and market forces
23 continue to drive energy efficiency improvements. And we
24 also see in monitoring the ENERGY STAR program it shows
25 significant PC energy consumption improvements from the

1 previous versions. And if you look at the trends from
2 version 3 to version 4 to version 5 to version 6, you see
3 significant improvements.
4 Regarding allowances, allowances are data driven,
5 they are not just picked at random. They're based on
6 component capability and power consumption, and since PCs
7 are highly considerable, so within HPC category, the
8 allowances for additional capability provide the
9 flexibility to drive innovation and meet consumer demand.
10 So if, you know, we are talking about discrete graphics,
11 or memory, or hard drives, those are essentially -- they
12 have improved significantly year over year, as well, but
13 because of the configurability of the computers that you
14 could see variation because that's how the computers are
15 used, and that's how the consumers would like to see -- to
16 limit the number of categories and not increase the number
17 of categories, that's where the allowances come into play,
18 because then you can limit the number of categories and
19 continue to have the right allowances for additional
20 capabilities for those components.
21 So we pretty much look at that as something that
22 consumers want and industry continues to drive innovation
23 and reduce energy consumption at the component level, as
24 well. Thank you.
25 MR. RIDER: Well, I'm going to go ahead and

1 actually read those. I guess the chat has been in the way
2 here, let me see if there's anything that needs to get in
3 the record. Okay, we do have one comment from Mr. -- I'm
4 probably going to brutalize his name -- Zivojnovic, Vojin
5 --
6 MR. ZIVOJNOVIC: Yeah, this is Zivojnovic --
7 MR. RIDER: Man, I'm sorry.
8 MR. ZIVOJNOVIC: No problem. Good to meet you
9 again.
10 MR. RIDER: Yes. He said in the chat -- or if
11 you would like to repeat it since you're on the line what
12 you've said --
13 MR. ZIVOJNOVIC: My comment was that -- I'm
14 coming from a mobile space, and worked for a long time at
15 ARM (ph), you know, in the mobile products, our management
16 is always on and there's no choice for users, an in-grade
17 (ph) or an iPhone is pretty much always on. And the power
18 management is very comfortably implemented in the device,
19 so I think a lot of these discussions would gradually
20 disappear because we will have functionality of the mobile
21 devices, sleep, deep sleep, wake-ups and so on, this will
22 all go in the direction of mobile device, are managing
23 that today.
24 MR. RIDER: Thank you for your comment.
25 MR. ZIVOJNOVIC: Thanks.

1 MR. RIDER: Okay, I think it seems like you've
2 already got the lines open. Oh, good. Well, I would like
3 to take the opportunity to open the lines if you could for
4 any folks that would like to comment on the energy
5 consumption of computers, the discussion topics, or
6 anything about energy consumption. Going once, going
7 twice. Okay, I'm going to move on --
8 COMMISSIONER MCALLISTER: Ken, I want to ask a
9 question or, well, just pose a question. Could you maybe
10 mute the folks on the line? I think there are a lot of
11 people multi-tasking out there in the world. Let's see, I
12 guess I'm interested in the views of the sort of spillover
13 effects between the mobile environment and the desktop,
14 the computers, and just get a sense of how big a
15 phenomenon that is and how differentiated usage tends to
16 be. I know I'm begging a qualitative answer, if there's
17 data about this that would be great. But certainly, you
18 know, to some of the speakers' points, and I've done some
19 research on these sorts of issues myself back in the day,
20 there is a market imperative to make things lighter,
21 faster, you know, less power consumptive, and also at the
22 same time to improve batteries and make them more power
23 dense, etc. But I'm wondering sort of how that spills --
24 how that bifurcates, or how that layers across the
25 computer space, so desktops -- how much are desktops

1 improving because of these innovations that were driven by
2 the mobile environment? So if anybody has any information
3 about that, or any sort of -- even a kneejerk qualitative
4 reaction based on your understanding of the marketplace
5 that would be great to hear.
6 MR. HOBSON: This is Lewis Hobson from Hewlett-
7 Packard. There's really nothing magical about power
8 management and mobiles, frankly. The big difference is
9 you are more acutely aware when it's not there because
10 your battery died, whereas you don't do that on desktop.
11 But the desktops that we put out have (indiscernible)
12 power management capability as the mobile products do. We
13 have processors (indiscernible) dynamic power savings
14 (indiscernible). We are there within almost future for
15 future. (Indiscernible) processor, but we're right there.
16 And you can disable laptop processor management, too.
17 It's just people know that when it's not there, your
18 battery dies and you (indiscernible). There's nothing
19 magic about it in mobile. And desktop has pretty much the
20 same features.
21 COMMISSIONER MCALLISTER: So you're saying this
22 is largely sort of a firmware-software issue more than a
23 hardware issue or that -- and basically I'm understanding,
24 and possibly wrongly, but that the hardware is similar and
25 maybe a generation or so removed between the two, sort of

1 mobile versus not mobile, but basically it's the same
2 piece of hardware?
3 MR. HOBSON: Both AMD and Intel converged their
4 mobile and desktop technology years ago, so the features
5 are there in the hardware.
6 COMMISSIONER MCALLISTER: Uh-huh.
7 MR. HOBSON: It's very likely if you're
8 disabling, it's more likely to be disabled in a desktop
9 because you don't have the immediate ramification of the
10 battery dying out, and you're pulling it from the wall.
11 So it's (indiscernible) on the laptop. But as far as
12 we're concerned (indiscernible) teacher per teacher
13 topically and in fee stage (ph), these (indiscernible).
14 Desktops, too, would be about a generation behind.
15 COMMISSIONER MCALLISTER: Great. Thank you very
16 much.
17 MR. ZIVOJNOVIC: So if I may comment, this is
18 Vojin again. There is a few differences and the
19 difference is in latency. The latencies between different
20 states of power management in mobile devices are measured
21 in milliseconds. And in the computers we see today,
22 they're measured in seconds and sometimes in tenth of
23 seconds. And this forces --
24 MR. HOBSON: No, no, no.
25 MR. ZIVOJNOVIC: Please allow me to finish. So

1 this forces users to keep their computers much longer on
2 because they're now used to the fast responsiveness of
3 tablets and phones, which are instantly on, and sleep in
4 the deepest possible state most of the time, and you press
5 your button or you don't use the computer. So this will
6 put pressure on the whole overall industry to really look
7 very carefully on numerous matters, researchers' results
8 and achievements in the mobile industry, which is that
9 which the young generation, which my generation which is
10 not that young anymore, is looking for. And there are
11 huge differences, theoretical latencies in the devices, in
12 how they operate, where they read for memory, how they go
13 to memory, and so on. And unfortunately we currently have
14 PCs which rely on the ACPI, which is built 17 years ago --
15 ACPI was introduced 17 years ago when the only latency was
16 we didn't know for anything better.
17 COMMISSIONER MCALLISTER: Well, so let me just
18 say, you know, that's all very interesting and I guess to
19 the extent that those developments in the middle space do
20 influence computers, then they're important to know about,
21 but I guess we're really focused here on computers, and so
22 where they're going, and mobile devices, per se, that's
23 probably a conversation for another day, but I appreciate
24 your point. So, thank you.
25 MR. HOLLENBECK: Hi, my name is Mark Hollenbeck.

I'm with Hewlett-Packard, representing TechNet. I'm not as technical as Lewis Hobson on the phone is, he's one of our technologists. But I guess what I'd like to say in answer to your question is that, you know, both desktops and mobiles are very competitive market and, you know, we've designed our products to be as energy efficient as we can over time in response to market forces like the ENERGY STAR Program. Notebooks are optimized for battery life and mobility, so there are certain design features that make sense for those. Desktops, on the other hand, don't implement all of those technologies where customers that want to have a desktop want expandability, stability; user lifetime and price are more important to customers of a desktop versus a notebook. But we do adopt the energy efficiency technology that makes sense for desktops as soon as we can. Thanks.

MR. HOBSON: So can I make one point here?

MR. RIDER: Oh, Lewis, just a second, we've got someone else in the room and then I'll call your name.

MR. HOBSON: Okay.

MR. DELFORGE: This is Pierre Delforge. Sorry, Lewis, I'll be brief. On the latency -- to respond, build on the point the gentleman from Aggios made early on, on latency in tablets, there's some -- and actually I'd like to -- maybe Shahid or some other manufacturer could

1 comment on the latest technologies by Intel, as well, and
2 maybe AMD, similar technologies which are trying to
3 introduce new sleep states -- no, trying to solve that
4 latency issue and be able to have very low latency sleep
5 modes even while the computer is on, so I think that's,
6 you know, as much as I understand it that's a way to try
7 and bridge that gap and move notebooks closer to behavior
8 of a tablet with very low latency, and which is very
9 promising in terms of being able to reduce the energy use
10 of notebooks and desktops. So I think it would be
11 interesting to hear about this a little bit more.
12 The other point I wanted to make is, when we talk
13 about laptops being optimized for battery life, I think
14 it's important to distinguish the fact that laptops have
15 two modes, they have battery mode and on power mode, and
16 very often the settings are very different and laptops,
17 when they are on power mode, are not always as efficient
18 as they could be; sometimes power management is not
19 completely disabled, but it certainly doesn't have as
20 aggressive settings and maybe, you know, I understand the
21 difference why you might want to different settings, but
22 there may be some optimization potential in there, as
23 well. Thank you.
24 MR. RIDER: Okay, Lewis?
25 MR. HOBSON: I want to make something clear here.

1 When I made the statement that desktops have the same
2 features as laptops, I was speaking X86 to X86. I was not
3 including slates (ph) or handhelds, that's entirely
4 different technology, those are pocket -- there's low
5 performance processors that are running OSs that have
6 limited multi-capability, but only just designed to run
7 simple games and let you do Web things, and it's very true
8 that there is no latency there because they never go to
9 sleep, they are always in idle, but they can idle very
10 slowly because they can use a low performance, low power
11 processor.
12 MR. RIDER: All right, thank you.
13 MR. ZIVOJNOVIC: Fully in agreement, yes.
14 MR. RIDER: Great. So I think, if it's all
15 right, Commissioner, I'm going to continue.
16 COMMISSIONER MCALLISTER: Please do.
17 MR. RIDER: All right, thank you for that. So
18 the Lifetime of the Computers. We received multiple
19 estimates of how long computers last, how long people
20 continue to use them out in the field. ITI and TechNet
21 submitted comments saying that enterprise, or business, or
22 commercial computers typically last around three to five
23 years. And for consumer computers, I guess there were
24 multiple groups -- maybe you can clarify this, actually,
25 Shahid, for me -- some computers have a one to three-year

1 lifetime, and some a three to five, and that was dependent
2 upon warranty and type of user. The IOUs also submitted
3 an estimate of lifetime of four, maybe little bit longer
4 than four years, and two to three years for laptops. So
5 the discussion point here is really that these lifetimes
6 are very -- contain some very large ranges. The ITI
7 comment could be anywhere between one to five years, even
8 two to three years, or three to five years, that's a very
9 large range in terms of percentages.
10 Should the Commission use in its analysis, or
11 should folks use, an average of these numbers, or some
12 weighting of, you know, 30 percent, or three years, 40 or
13 four years, and then another 30 or five years, or
14 something like that? So I'm going to open it up to folks
15 in the room to comment on the lifetime. Go ahead and
16 approach the podium if you have anything to say.
17 MR. SHEIKH: Okay, this is Shahid again. On the
18 lifetime discussion, as we mentioned that they're very
19 different forces in terms of the lifetime replacement
20 cycles, what you see in the -- in the enterprise largely
21 run by IT policies, and even the economic environment
22 comes into play; some companies may postpone their
23 replacement cycles based on overall economic environment
24 and how well the companies are doing. But on average, we
25 see a certain trend and IT policies on the replacement

1 cycle, so it's just more predictable in the commercial
2 space than in the consumer side. The consumer is, you
3 know, again we thought it's mostly driven by warranties
4 and when the warranties run out typically consumers are
5 ready to buy new pieces, and warranties typically could be
6 one to three years, in some cases three to five years.
7 And again, economic factors also play a big role for
8 consumer buying behavior on PCs. So our thinking is a
9 weighted average approach may be okay based on the
10 commercial and consumer PC lifecycles driven by different
11 factors.
12 Now, if this is a very important consideration
13 for CEC, one idea may be to sanction a small study of work
14 with a third party to understand, an analyst, to
15 understand the existing PC stock replacement in
16 California, and new PC shipments in California to look at
17 what is the age of the stock in California, how often
18 people replace them, and look at how, as the new shipments
19 come in, are they looking to what component of that is to
20 replace the old stock versus as a first time buyer, so
21 looking at it from that perspective. So it really depends
22 on how important this factor is and maybe a small study
23 may be warranted. Thank you.
24 MR. RIDER: Thanks, Shahid. Just to respond a
25 little bit in terms of the Energy Commission. The

1 lifetime is a fairly important aspect, especially when
2 we're looking at the cost-effectiveness of any program.
3 The payback period is obviously going to vary by the
4 lifetime of the product, so when we do lifecycle analysis,
5 you know, and that goes for any kind of program, even a
6 voluntary or a rebate program, any kind of program really
7 needs to nail down how many years the savings are going to
8 accrue, and so I would say this is a fairly important
9 number to get nailed down.
10 MR. DELFORGE: Pierre Delforge, NRDC. So we
11 support a weighted average approach. A number of factors
12 need to be taken into account and that weighted average is
13 when we talk about replacement cycles, a number of these
14 replaced computers end up being refurbished, reused; how
15 much is that, I don't know, but that would be interesting
16 to find out and to factor that in terms of lifetime.
17 Another thing to consider is that to estimate the
18 life on computers, one could indicate it would be to use
19 take back data from manufacturers, and I think it would be
20 interesting to get manufacturers data from that. Some
21 data I've heard from several manufacturers is around seven
22 years, so used internally about seven years from the time
23 they sold the equipment and what they get back on the take
24 back programs; I don't know if that's representative, but
25 I think that would be interesting to hear, and I'm not

suggesting we should use seven years as an average, but just as one data point when we do that weighted average. The other thing I wanted to mention is that one of the trends -- there isn't much data out there when you search for data on the lifetime of computers, there's very little available that we could find, but one thing we've been able to see is some analyst comments indicating that the lifetime may be increasing as replacement cycles are slowing down, and probably are actually consistent with the decrease in sales numbers. So we have to be careful that when we look at estimates of lifetime, which may be several years old, they may no longer be representative of current lifetimes or expected lifetime over the life of the standard. Thank you.

MR. DEWART: Nate Dewart from Energy Solutions on behalf of the California IOUs. I also wanted to support the use of a weighted lifetime, but I just want to also reiterate that when looking at the RASS data and also the CEA data, when you take a look at stock, it does seem that the lifetime of the products may be longer than when you add up the sales that are purchased, or the shipments that are being purchased. So we recommend at least four years and at least three years for notebooks, and just wanted to point out the four years was from ENERGY STAR, and the two to three years estimate was from Toshiba directly, so

given the other information I think it makes sense to use at least four, and three years for laptops.

MR. RIDER: So perhaps a conservative estimate rather than taking a weighted approach, as well, could be taken?

MR. DEWART: Yeah.

MR. RIDER: Okay. Peter, if you could open it up. Any comments on the phone? The line is open. All right, go ahead and mute it.

Incremental costs. So we received incremental cost estimates from stakeholders on several things, but one thing that we received a lot of incremental cost data on is the 80 plus power supply, which is internal power supply, desktop power supply. And we received estimates from the IOUs on the incremental costs for more efficient internal power supplies from the Green Tech Leadership Group (GTLG) and also from ITI and TechNet. And I've tried to kind of summarize all those different costs in this slide, a lot of dollar signs on here, but essentially the IOUs characterize the incremental cost of going from a non-80+ -- an 80+ is a program, 80 stands for 80 percent efficient -- anyway, so they estimated the incremental cost from going from a non 80+ level power supply to an 80+ level power supply, and then a cost estimate for every one percent of active mode efficiency achieved after that.

The Green Tech Leadership Group and ITI characterized the incremental cost going from 80+ to 80+ Bronze, Silver, Gold and Platinum, which are different stages, each represent a different percentage of efficiency. But the main thing to note here is that the costs are not very consistent with one another, so I thought it would be a good thing to discuss in this workshop.

So the points of discussion for the incremental costs, and of course you can also bring up other incremental costs if you would like to, but there is this large discrepancy in the information submitted in the response to the ITP about the incremental cost of 80+ power supplies, and we're curious as to what the root differences are in these estimations.

Also, the Green Tech Leadership Group suggested a lot of market momentum behind the 80+ Gold level, and I was curious what is driving this transition, why does Gold have such a large increase in number of models and potentially market share? So with that, I'll open it up to stakeholders.

MR. DEWART: Nate Dewart from Energy Solutions on behalf of the California IOUs. I just wanted to make a point of clarification regarding the $7.00 number when looking at -- so that's pulled from the NEEA Study, I

1 believe it's 2012 -- the $7.00 could be attributed to the
2 incremental cost between non-80+ and Bronze, and it's only
3 $2.00 between non-80+ and 80+ base. Also, I just wanted
4 to add that the NEEA study also has more detailed
5 information about the incremental cost between 80 base and
6 Bronze and, I believe, Silver. So there's a table in
7 there that would be useful to reference, as well.
8 MR. RIDER: Thank you. We'll take a look at
9 that.
10 MR. BRUNELLO: Tony Brunello with the Green Tech
11 Leadership Group. First, thanks you guys for putting in
12 this process, we look forward to working with you guys as
13 we move forward.
14 So in terms of our submittal from Green Tech
15 Leadership Group on the cost, there's three things that we
16 think, just in a preliminary look at some of ITI's work
17 and TechNet, and we'll let them answer to it, first is
18 probably looking at sort of an apples to oranges
19 comparison. What we have is not manufacturing costs, we
20 tried looking at build of materials, so it's actually the
21 costs of what the actual products are, not actually to the
22 consumer, so that's a core one.
23 The second one is that some of our numbers are
24 looking at the marginal differences. We actually started
25 with thinking that the world is already at the 80+ level,

not from a different baseline, so ours are marginal changes as you bump up in the different categories, and the final thing is probably about timing. Ours is real time and talking to our members. Many of our members, we think, are enabling a lot of the technologies to reach some of the efficiency standards that we're trying to hit already. So I think those are some of the core things to consider, the apples to oranges, the timing, as well as just looking at the actual marginal differences.

Why we hood in for 80+ Gold was simply -- and we put this in our comments to the CEC -- is that that's really what it looks like, where the market already is. There actually -- if you look on the website for 80+, a lot of the people who are requesting to have that standard, they're already there, so we're just taking it from existing data. Okay, thanks.

MR. SHEIKH: Shahid from Intel, representing ITI/TechNet. No, we don't understand, really, the big difference here could be driven by pure estimates, or what people see on the websites versus ITI/TechNet data is based on the real supply codes. What we have is an average of within the industry members what we see, the system makers are actually paying, these are the adders based on our average. And the supply codes vary and we expect that, since we represent large manufacturers, the

1 number should be closer to what the reality is. The
2 supply codes are a function of component availability,
3 component demand, contracts, price negotiations, they're
4 all factors that play into this.
5 In terms of the second question about GTLG
6 suggesting market momentum for 80+ Gold, you know, these
7 low cost adders for 80+ Gold, we don't think they
8 represent reality. One to two dollar cost adders for 80+
9 Platinum, or 80+ Gold, we think is not based on the
10 industry data and experience. But industry would be
11 interested to understand sources of the data and where
12 these supply codes are coming from in terms of the adders,
13 incremental one to two dollar adders on 80+ Gold and 80+
14 Platinum. Thank you.
15 MR. RIDER: Thank you, Shahid.
16 COMMISSIONER MCALLISTER: I'll just say this is a
17 really important question, you know, this cost-
18 effectiveness kind of question that's really important to
19 make sure that we get good information in on because it's
20 got to be solid, but also there's got to be a range, and
21 we need to be able to suss it out in an appropriate way,
22 and different members of the industry may be at different
23 places on this, I really think it's important for the
24 Commission to understand the universe and sort of the
25 underlying factual basis for a lot of this information

1 because, you know, what is the incremental cost is one of
2 the key issues that always comes up over and over again,
3 and I think we want to have as good a handle on that as
4 possible. So sorry for the interruption, but I just
5 wanted to point out that I think this is a very important
6 topic, maybe it's self-evident, but I just wanted to --
7 it's a place where we really need to make sure that -- we
8 really want to see participation from everybody to help us
9 have as broad an information base as possible.
10 MR. RIDER: Go ahead, Pierre.
11 MR. DELFORGE: Pierre from NRDC. Just one
12 comment. It's not on the slide, but on the market factor
13 which is basically the factor you add up from
14 manufacturing costs, manufacturing sales price, to OEMs
15 and the retail price, both the IOUs and ITI reference an
16 NRDC number which came from the DOE (indiscernible)
17 document of 1.625 as a factor, which (indiscernible) in
18 that just to confirm it and it's actually not the right
19 number. This factor of 1.625 is the baseline mark-up,
20 which is basically the mark-up for the whole product, and
21 the mark-up we should be looking at is the incremental
22 mark-up, which is basically what is the mark-up on making
23 the product more efficient. And DOE also has an estimate
24 for that and it's 1.35, which is about half the mark-up
25 for the baseline mark-up. So we suggest using that mark-

1 up which hopefully impacts the cost-effectiveness, as
2 well.
3 MR. RIDER: Pierre, is that from BOM to retail or
4 from what point to what point is 1.35 the factor?
5 MR. DELFORGE: 1.31?
6 MR. RIDER: 1.31.
7 MR. DELFORGE: Yeah, I think -- well, I can take
8 a look, but I believe it's BOM to retail, but we can check
9 it, it's in the TSD or the NOPR documents for DOE, so we
10 can just refer to it. Thanks.
11 MR. RIDER: Thank you. Hi, Tony.
12 MR. BRUNELLO: Tony Brunello again. I just
13 wanted to follow-up on that comment. So I think it would
14 be great, and I'm following up on Andrew's comment to
15 maybe get together so we actually are talking apples to
16 apples. I think we also had the same question of looking
17 at the ITI submittal that looked like some of the data was
18 from 2011, and I think a lot has happened in the last two
19 to three years, so I think really being able to talk about
20 more current data where costs have significantly decreased
21 in the number of products, so I know a number of the
22 partners who were here, it might make sense for us to
23 maybe sit down and get through those numbers, so
24 appreciate it.
25 MR. RIDER: Thank you, Tony. If you could, real

quick just check the line? So if you're on the phone, we're opening up the line for you if you would like to make a comment on this, on the cost of efficiency. Going once. If you could mute the lines? Okay, actually this is bringing us to our last which is good because we're just about out of time.

I just wanted to open it up. Any general comments any folks want to make on the ITP? Please keep them brief because we need to move on to the next subject. But I'm opening it up at the moment, you know, if anyone has any additional comments focused on the data or information given to the Commission in response to the ITP, I'm going to open it up to the folks in the room to make any comments.

MR. SHEIKH: This is Shahid again. Just to recap one clear message from TechNet/ITI we want to convey is the global harmonization is key to any regulation on computers. We want to make sure that the standards and the weighted approach on regulation should be consistent globally and here we want to look at ENERGY STAR as the right framework and methodology for CEC, ENERGY STAR version 5.2, and use of IEC 62623 as a standard. And, you know, there are two ways to -- when we get to the actual proposals we'll talk about it, but just to give you perspective in terms of setting up the targets -- there

are two ways to approach setting up targets, one is doing a large study to establish what the right targets are for California with a goal to remove the bottom 10 to 25 percent of the least energy efficiency products on the market, or, if there are not enough resources to do that, then looking at how these targets are established elsewhere globally on the MEPS-based program, so I think the key is to harmonize globally on how these programs have been established elsewhere and converging the ENERGY STAR version 5.2 framework. Thank you very much.

MR. RIDER: Any other comments? Pierre.

MR. DELFORGE: There's one data point which I think would be very useful to get from industry. One thing that we'd probably hear or discuss in the proposal stage is manufacturing variability and how that needs to be taken into account, and I think in order to have a proper discussion on this one in data, we didn't get any data on this point, so I encourage industry colleagues to provide data on manufacturing variability so we know what that really is and how it's taken into account in the standard.

On a higher level, I want to get back to this question of framework and, again, I understand this is not the standard setting phase, but I think it's important to realize that the ENERGY STAR version 5 framework dates

1 back from 2008, and so that's five years, and it will be
2 seven years by the time the CEC standard becomes
3 effective, and it's not really obsolete, especially in
4 terms of categories. Most of the products now bunch up in
5 one or two categories, which does not allow for a
6 performance-based standard, so we think it's really
7 critical to -- although we agree on harmonization, in
8 general, there needs to be a point where you harmonize on
9 the next level, and we think we've reached that point, and
10 it's really important, as ENERGY STAR is finalizing
11 version 6 that we look at that as harmonization point
12 going forward.
13 As just a conclusion, we think there's a wealth
14 of data available on computers from the ENERGY STAR
15 datasets, from data collections, from other data
16 collection efforts, on graphics, on power supplies, on the
17 IOU studies on cost-effectiveness. There's a lot of
18 potential for savings and we think, you know, the computer
19 is not going away, there might be a steady reducing, but
20 it's still a very large energy use and we think there's
21 potential for, you know, if we could save 25 percent of
22 computer energy use, that would be 2,000 gigawatt hours of
23 savings per year, and this is very significant and we
24 encourage the Commission to move forward. Thank you.
25 MR. RIDER: Thank you, Pierre. Can you open up

1 the line real quick? Okay. Nate, you can go ahead.
2 MR. DEWART: Nate Dewart for Energy Solutions on
3 behalf of the California IOUs. I just wanted to point out
4 that we've identified -- the IOU team has identified a
5 number of opportunities in the testing that's been
6 performed on three of the ENERGY STAR 6 categories, and
7 additional testing is forthcoming addressing the other
8 three categories for desktops, and I just wanted to
9 reiterate that we've identified some opportunities and
10 foresee that we may find some additional opportunities in
11 these other categories, and reiterate the support of
12 ENERGY STAR 6.0; given the amount of work that's gone into
13 the development of that framework, I think it makes sense
14 to go forward with that framework.
15 MR. RIDER: Thank you, Nate.
16 MR. DEWART: Thanks.
17 MR. RIDER: Is there anyone on the phone that
18 wanted to make any last comments?
19 MR. ZIVOJNOVIC: This is Vojin from Aggios. I
20 just want to comment that introducing the mobile power
21 management in the computer industry with all its massive
22 research and achievements could be equivalent to
23 introducing catalytic converters into cars, the technology
24 was completely changing the way how we perceive pollution
25 and how we invest in order to have it there, in very

similar way there is existing technology, it should be moved into the computers as soon as possible because a major impact is possible with research and established means of the mobile power management.

MR. RIDER: Thank you. Any other comments? All right, so we're running short on time, so I'm going to try to get through these last slides quickly.

So as we discussed earlier, and I believe Harinder mentioned, this workshop marks the end of the ITP process. We're moving into the Request for Proposal process, which is probably timely that everyone starts stocking and starts thinking about frameworks, like Shahid mentioned, and Pierre, and Nate, at the end of this conversation.

The timeframe, we're opening the proposal process up from June 10th to July 25th. We will be releasing a proposal template to help guide stakeholders to make meaningful proposals to the Energy Commission, and I want to emphasize that staff are always available for questions about any step of the process as we continue forward. If you have questions about the Request for Proposals, please call us and ask us and we would be more than happy to talk with you, meet with you, whenever necessary.

Again, we're moving now onto the Request for Proposal stage. If you've seen this graphic before, we've

gone past that green square and are moving on to the next step. This is my contact information. I'm also going to be available around this workshop all day; if you'd like to talk to me while Josh is presenting, I'll be here.

And I think we had a break. Do we want to keep it to a 10-minute break since we're running behind? Okay, we had a scheduled 15-minute break, running a little bit behind schedule, so a 10-minute break. Again, the restrooms are out that door and thank you for listening to my presentation. Thank you again so much for your participation in this process.

(Break at 10:53 a.m.)

(Reconvene at 11:07 a.m.)

MR. BUTZBAUGH: Okay, my name is Josh Butzbaugh and I'm working with California Energy Commission on the 2013 Appliance Efficiency Rulemaking, and today I'm going to discuss the results of the Invitation to Participate for the Displays category.

This is our agenda for the Displays category. I'll briefly go through the purpose and then information requested, and then we'll spend the bulk of the time on responses and receiving interested parties and stakeholder responses and thoughts on these different topics that I've listed here.

So as Ken discussed this morning, the Invitation

1 to Participate is an opportunity for interested parties to
2 submit information to the Commission to inform the
3 Commission on policy and direction and process. We really
4 appreciate everyone's responses that came in.
5 We're looking at four display categories:
6 monitors, digital picture frames, professional signage,
7 and electronic billboards. As you can see, we requested a
8 wide breadth of information from scope and product
9 definition, to market characteristics, to market
10 competition. And we received some really good responses
11 from some organizations on this information and, with
12 that, I'll move right into what we received.
13 So first topic, product lifetime, similar to
14 computers, we received a pretty wide set of numbers. We
15 had four years submitted by the IOUs based on a Lawrence
16 Berkeley National Lab study. We also had a number
17 indicating 10 years from the CEA's report, and then ITI
18 submitted some information indicating minimum design
19 targets of one to three years, or three to five years, and
20 for enterprise models typically three to five years.
21 I'd like to get some feedback as to whether the
22 Commission should again put together an average, or rely
23 on one of these numbers, and how people feel about the way
24 these numbers were developed and the weight of them.
25 MR. HOLLENBECK: Hi, this is Mark Hollenbeck with

1 HP, representing ITI and TechNet. I would say in general
2 it sounds like you're on the right track with a lot of the
3 more conservative values that have been given in the one
4 to three, or three to five range, depending on whether or
5 not it's consumer or commercial products that you're
6 talking about.
7 Some of the estimates that are in the longer
8 timeframes, we don't think those are -- we don't think
9 they're probably right. I saw one comment that talked
10 about perhaps using product recycling as a benchmark for
11 determining the product lifetime. I don't think that's
12 necessarily a good benchmark because, you know, when the
13 product is returned isn't necessarily when the user stops
14 using it, so the product may sit around unused for a
15 couple years, which may account for the longer timeframes
16 being quoted. The best that we can suggest would be to
17 look at the warranty information as we submitted in our
18 response. Thanks.
19 MR. BUTZBAUGH: Thank you, Mark. Anyone else
20 have some feelings on -- any thoughts on product lifetime?
21 Peter, do you want to open up the lines and see if anyone
22 -- does anyone on the phone have some thoughts on product
23 lifetime and these numbers here on the slide? It doesn't
24 sound like it.
25 MR. STRAIT: Just as a note to people that are

1 attending from their computers, you do have the ability if
2 you're on your computer to mute and unmute your own line.
3 For the next times that we look to the phones and those
4 that are participating online, first we'll start with
5 people that can unmute their own line, you can unmute
6 yourself and provide a comment; afterwards, we will go
7 ahead and unmute the full set of folks for those that are
8 only attending by phone. Thank you very much.
9 MR. BUTZBAUGH: Okay, with that, I will move on
10 to the next slide. And that's Duty Cycle. So we received
11 some information from the IOUs on Duty Cycle, this is
12 based on information from CEA's report and Navigant. And
13 these are the Duty Cycles that were developed and put
14 together for residential consumer monitors, as well as
15 commercial. I'd like to hear if the manufacturers or if
16 industry has any thoughts as to whether these are
17 representative, or if they have any information that
18 indicates otherwise.
19 MR. HOLLENBECK: Hi, this is Mark again. Really
20 consistent, and what I'm speaking about would be the
21 lifecycle or the Duty Cycle for PC Displays because
22 obviously they're connected to the PC. We think one
23 representative Duty Cycle makes sense. The best thing
24 that we know to offer right now would be the Duty Cycle
25 that's built into the ENERGY STAR tech equation, and you

simply apply that to displays in a modal way, looking at the number of hours spent in each mode. If other folks were to suggest that that particular Duty Cycle doesn't make sense, then we feel that you'd have to do a pretty substantial study to determine something that might be more appropriate, depending on what's going on with users. And there's a wide variation with what's going on with users. So bottom line for us would be to stick with the Duty Cycle that's in the ENERGY STAR specs.

MR. BUTZBAUGH: So you think it's more appropriate to have one Duty Cycle, rather than split them out based on residential and commercial?

MR. HOLLENBECK: I think without more data, without a fairly substantial study, one makes sense.

MR. BUTZBAUGH: Okay. And have you taken a look at these studies? I mean, do you think that these --

MR. HOLLENBECK: I haven't studied them in depth.

MR. BUTZBAUGH: Okay. Thanks.

MR. HOLLENBECK: But I would say that if -- for most of the studies that I've seen, and one of the things that we're doing and we suggested, was a PC use study because a lot of the studies that I have read about use of PCs, for example, weren't in depth enough, they were dated, or you saw wide variation in conclusions. So to be honest with you, I don't have a lot of confidence in those

1 studies.

2 MR. BUTZBAUGH: Okay. Thank you, Mark. Bijit.

3 MR. KUNDU: Bijit Kundu with Energy Solutions on
4 behalf of the California IOUs. I just wanted to point out
5 in terms of comprehensive studies is, first, we know that
6 the two sources that we've cited here, the Fraunhofer
7 study and the Navigant study, were fairly comprehensive,
8 you know, a comprehensive survey of Duty Cycles for both
9 residential and commercial displays. So I just wanted to
10 note that.

11 MR. BUTZBAUGH: Thank you, Bijit. Anyone else in
12 the room? Okay. Doug?

13 MR. JOHNSON: Doug Johnson, Consumer Electronics
14 Association. Let me offer for the record here again, as
15 well, the obvious fact that this is a three-year-old study
16 at this point that we did. Duty Cycles can change over
17 time and certainly will use the same methodology as we
18 revise this study, may even add to it, but we want to make
19 our next study as consistent as possible with the study
20 that you're referencing here, but just please note that
21 this is 2010 -- largely 2010 model data, and that the
22 usage or duty cycles were based on consumer surveys, as
23 well done in that time period.

24 MR. BUTZBAUGH: Doug, do you have an idea of when
25 that -- are you in the process of developing a study? Is

1 that what I'm hearing?

2 MR. JOHNSON: We had planned to begin the several

3 month process to produce a new study sometime this summer;

4 obviously, it's of interest to have it sooner than later,

5 but we're trying to follow the every three-year pattern

6 that we established a few years ago.

7 MR. BUTZBAUGH: Great. Thank you. Peter, how

8 about we open up the lines? Anyone on the phone with

9 thoughts on Duty Cycle? It doesn't sound like it, so we

10 will move forward.

11 So this is a graph representing the breakdown of

12 consumer and business sales and shipments from 2011, then

13 projecting forward to 2016, specific to California. And

14 as you can see, it appears that consumer shipments are

15 decreasing and enterprise or business sales are remaining

16 approximately the same. I just want to make sure that

17 that's consistent with what everyone else has seen in the

18 market. And if no one has a comment on that, then I will

19 just move forward.

20 Peter, do you want to open up the lines real

21 quick in case anyone has a comment on that? Mark has a

22 quick question, it sounds.

23 MR. HOLLENBECK: Thank you. I didn't really see

24 anything that was wrong with this data, so I don't

25 necessarily have a problem with it. I did have a

1 question, if anyone knows, and that was whether or not
2 this data included what we would call professional or high
3 performance displays, if you know, or anyone else knows.
4 MR. KUNDU: Bijit Kundu, Energy Solutions on
5 behalf of the IOUs. Yes, it does include it.
6 MR. HOLLENBECK: Okay, thanks.
7 MR. BUTZBAUGH: Thank you, Bijit. All right,
8 with that, I'll move on to the next slide. I'm actually
9 going to show you a few slides here because they're all
10 based on the same subject, and then folks can come up to
11 the mic and comment.
12 So this is from the CEA Report. It indicates an
13 average screen size of 18-inches. This is based on data
14 from three years ago. And then this is another chart here
15 indicating that screen size for desktop monitors, which is
16 the top row, is increasing from 2010 to 2013 from 19.9-
17 inches to 20.9. This is a graph here indicating that,
18 again, screen size is increasing for business. As you can
19 see, the 18 to 19-inch bin is decreasing -- the 23 to 24-
20 inch is increasing significantly. And you also have the
21 16 to 17-inch bin that's decreasing.
22 This is for the consumer segment. As you can
23 see, total shipment numbers are going down, but amongst
24 the 23 to 24-inch bin, that bin is staying relatively
25 flat, while the bins for the smaller screens are going

1 much further down. So if any folks have some comments on
2 screen size and the trends we're seeing in these graphs,
3 and I can bring up any particular graph that you'd like me
4 to bring up, please feel free to make those comments.
5 MR. HOLLENBECK: Mark with HP again. Just a
6 general comment that we think your data looks pretty good
7 with what we're seeing, as well, that currently, you know,
8 people are buying the 17 to 19-inch displays and the trend
9 is to go to the 20 and 24-inch. But the one thing I would
10 say about that is, with what we know now, we don't see
11 displays larger than 24-inch continuing the trend, and so
12 the volume on those, or the take-up rate on those larger
13 displays is, as far as we know, still going to be pretty
14 low.
15 MR. BUTZBAUGH: Thanks. No one else in the room
16 has a comment, so if you can open up the lines? Anyone on
17 the phone real quick?
18 MR. SHARP: This is Mark Sharp with Panasonic.
19 Can you hear me?
20 MR. BUTZBAUGH: I can hear you, Mark, thank you.
21 MR. SHARP: Okay, I apologize, I was trying on a
22 computer to speak and apparently I couldn't unmute for
23 some unknown reason. But I had a question about the scope
24 and the scope specifically addressing professional signage
25 and electronic billboards. My question is, Panasonic

1 submitted comments to the ITP earlier this month, and in
2 those comments we pointed out that the CEC in its
3 correspondence to the CDA on March 29, 2010, stated
4 clearly that broadcast and post-production monitors, as
5 well as monitors in an airport and displays in retail
6 locations without tuners would be covered under the
7 television regulation of the CEC. And if that's the case,
8 I'm wondering why they're included in this discussion for
9 displays.
10 MR. BUTZBAUGH: Mark, thank you very much for
11 submitting that comment, we really appreciate it, and
12 right now we're in the information gathering phase, and I
13 highly recommend if anyone is submitting a proposal for
14 professional displays and professional signage that you
15 make it clear in the scope what you're aiming to propose a
16 standard for, and how that differentiates from the
17 existing TV monitor definition and the TV Regulations, and
18 it looks like Bijit has something to say on this, as well.
19 MR. KUNDU: Thanks. Bijit Kundu, Energy
20 Solutions on behalf of the California IOUs. It's our
21 understanding that by law, by Federal law, any display
22 that's not sold with a tuner cannot be marketed as a TV,
23 so I guess it's my understanding that those sorts of
24 professional displays can't be called televisions and
25 should therefore not be considered under any Title 20

1 Television Regulation and, more appropriately, as it is
2 with ENERGY STAR, more appropriately addressed in an
3 Electronic Displays rulemaking or scope.
4 MR. BUTZBAUGH: Thank you for your comment,
5 Bijit. When it comes to submitting a proposal, just
6 please try to keep it within the California law, I mean,
7 within RTD Regulations. Yeah, the contact stuff, the TD
8 Regulations. I just wanted to make sure to say it.
9 Okay, if there are no more comments on the phone,
10 then we'll move forward. So this is a bar chart on
11 Resolution. It indicates that high resolution screens are
12 increasing, and we've received information that indicates
13 that higher resolution monitors will typically consume
14 more power due to the increased brightness of the back
15 light and additional controllers.
16 We'd like to hear anyone's comments as to whether
17 this is what other folks are seeing in the market and
18 their thoughts on resolution.
19 MR. HOLLENBECK: Mark again. Just a brief
20 comment that we agree with what the data is showing, no
21 argument there. The only point that we would make is, you
22 know, clearly additional resolution consumes more power,
23 but it also provides more utility to users, as well. So
24 when you get to the point of considering setting limits
25 for those, you'd want to look at it the same way EPA has

1 looked at it as far as accounting for differences like
2 resolution and considering higher specs, or adders for
3 higher resolution.
4 MR. BUTZBAUGH: Thank you, Mark. It doesn't look
5 like there's anyone else in the room. How about we check
6 the lines real quick? Is someone making a comment? It
7 sounds like that's not a comment, so we'll move forward.
8 Oh, Pierre has something he'd like to say.
9 MR. DELFORGE: Pierre from NRDC. I just want to
10 express a little bit of surprise at the data here and it
11 seems that, as of two years ago, already half of the
12 volume was the highest resolution available. I don't know
13 what the source of the data is, but it seems surprising
14 and probably needs validating. Thank you.
15 MR. BUTZBAUGH: Thank you. So the next slide is
16 Backlighting, and this is indicating that the CCFL
17 technology for backlighting is decreasing, while LED is
18 increasing, and this projects through 2016, and this is
19 for U.S. market data. Again, just seeking input as to
20 whether this is what other folks are seeing in the market.
21 MR. HOLLENBECK: This is Mark again. We agree
22 that that is the trend. There was a lag, you know, in
23 displays, larger PC displays versus notebooks, but as the
24 technology for LEDs has become more viable for the larger
25 displays, we're seeing that transition, as well. And

1 certainly there are some areas of the world where products
2 containing mercury are an issue anyway, so I think that's
3 driving some of that, as well.
4 MR. BUTZBAUGH: Great. Thank you, Mark. Anyone
5 else in the room? Anyone on the lines, Peter? Sounds
6 like the same guy. Okay, we will move forward to the next
7 slide.
8 So I'm going to show you a few slides and then
9 folks can come to the mic and comment. So this is based
10 on ENERGY STAR Qualified Products List, as well as other
11 product data submitted, and the version 6.0 spec
12 development process. It's my understanding this is a good
13 set of data for what displays and computer monitors are in
14 the market, so this is for all monitor types based on
15 screen size and on mode power, active mode. Again, this
16 is the same data, just represented differently in a box
17 and whiskers plot, you can see the first and third
18 quartiles, the mean, and then the upper and lower range.
19 The next slide is for CCFL backlit. And then
20 this slide is on LED backlit, and as you can see, they're
21 pretty wide bands of power for active mode, even in LEDs.
22 For certain screen sizes, you're looking at, for instance,
23 250 square inches. You're looking at almost 16-17 watt
24 draw versus the neighborhood of 40. So there's some
25 pretty wide bands even for LED.

1 Does anyone have any comments on the ENERGY STAR
2 data or active mode and what this data is indicating? I'm
3 not seeing anyone in the room. Looks like Mark wants to
4 make a comment. Feel free, Mark.
5 MR. HOLLENBECK: So we -- the first thing I would
6 say just to keep in mind is that the ENERGY STAR Qualified
7 Product List data is good data, it's not all displays in
8 the market, of course, it's generally the most efficient
9 products in the market, so keep that in mind. The other
10 thing that we suspect is going on with the data is that
11 this is the raw active mode power consumption data and it
12 probably doesn't account for additional features and
13 displays, additional features or capabilities that
14 displays might have. It probably is not accounting for
15 resolution, automatic brightness control, perhaps
16 speakers, network connectivity, just additional
17 capability. So what that says is in the future that if
18 you're going to consider regulating them, you can't just
19 look at data like this, but you also have to look at the
20 additional capability features and account for those in
21 the specs.
22 And the other point that we think is probably
23 going on here is that this is, you know, all types of
24 displays and that the higher end is probably your higher
25 performance, higher resolution displays.

1 MR. BUTZBAUGH: Okay. Thank you, Mark.
2 MR. KUNDU: Bijit with Energy Solutions on behalf
3 of the California IOUs. Just a couple quick
4 clarifications on this data, 1) this data does include
5 non-qualified models from the spec development process, so
6 it's not just the ENERGY STAR QPL list or ENERGY STAR
7 qualified models; 2) Mark brings up a good point. We did
8 look anecdotally, or qualitatively, I should say, at some
9 of these spreads and some of these popular screen sizes in
10 terms of what could account for the difference, and it
11 looks like, you know, for most of these there are minimal
12 differences in feature sets for like within a specific
13 screen size, or at least feature sets that would affect
14 the power draw, the active mode power draw of the models.
15 We will in our future proposals be including more of that
16 information in subsequent stages.
17 MR. BUTZBAUGH: That would be very helpful,
18 Bijit. Thank you. Let's go to the phone lines and see if
19 anyone has any thoughts or questions.
20 MR. SHARP: Josh?
21 MR. BUTZBAUGH: Yes.
22 MR. SHARP: Yeah, it's Mark Sharp again. I
23 apologize. Again, I want to go back just very briefly to
24 my earlier comment to which you responded and Panasonic is
25 not proposing a standard, per se, we're asking for

clarification on the definition of televisions. I know that Bijit of Energy Solutions responded, but it doesn't directly address that the current CEC Regulations for Television --

MR. BUTZBAUGH: One second, Mark. I think we've got someone talking over.

MR. SHARP: So anyway, I'm just trying to get clarification, if we have a current definition in the CEC law covering televisions and that definition has been in writing, stated by the CEC to apply to these types of professional signage and billboards, why are they still being discussed today?

MR. BUTZBAUGH: Well, Mark, we're in an information gathering phase and you submitted information and that's really, you know, it's really important and I really appreciate that. And, you know, that's something that we're taking into consideration. I think the folks who are putting together proposals on professional displays will have to take a look at the TED Monitor definition and think about what professional displays are and see if it falls in that definition, or if it falls into a computer monitor definition, or if it's in a certain size bin, and that's the way I view it right now.

MR. STRAIT: Actually, this is Peter Strait with the California Energy Commission. Just to provide a point

1 of clarification on that topic, because we're in an
2 information gathering phase in preparation for a
3 rulemaking, we'd like information on all sorts of
4 products. We'd like your questions about whether or not
5 your products should or should not be categorized to
6 television, we'd like your thoughts and possibly your
7 proposals on whether we should stay with the current
8 definition of television, or make some modifications to
9 make it clearer what's regulated and what isn't. So at
10 this point, we're casting a wide net; we're trying to
11 avoid biasing people to say "I'm not going to give
12 information because I think mine is this type of display
13 versus that one." We just like as broad a picture of the
14 landscape as possible. So, to your specific concern about
15 the existing definition of television, we are -- again,
16 really to this proceeding, we just want comments to be
17 made in that context.
18 MR. BUTZBAUGH: Thanks, Peter.
19 MR. SHARP: Okay, understood. That's fair
20 enough. I just would add that, in the initial document
21 that you're presenting, you've listed a number of comments
22 and there was no comments regarding the scope, so I was
23 under the impression, perhaps wrongly, that our comments
24 previously submitted have not been considered.
25 MR. RIDER: Yeah, this is Ken. I just wanted to

1 add a bit to the responses to the definition of a
2 television. We have responded in writing to the industry
3 about the definition of a television, that certainly still
4 stands, that's the CEC's interpretation of the definition
5 of a television; however, when we went into this OIR, ITP,
6 different phases of the rulemaking, we left the scope
7 undefined. We were looking to displays and we didn't --
8 we actually seek feedback in this process about what a
9 display could be, and your feedback is certainly noted.
10 But the CEC had no intent, we got information on
11 billboards and all sorts of interesting aspects of
12 displays, but from the Energy Commission's perspective
13 going into this, we really, like folks have said before,
14 did not define what a display was, just that we were
15 interested in looking at displays. And of course that
16 incorporates things that do not meet the definition of a
17 television such as a computer monitor. Thank you.
18 MR. BUTZBAUGH: Thank you, Ken. Does that work
19 for you, Mark?
20 MR. SHARP: Yeah, that's helpful. I appreciate
21 that feedback and I apologize for bringing that up now, I
22 did earlier and I was muted, unfortunately.
23 MR. BUTZBAUGH: No problem. Thank you very much
24 for bringing that up, it's important. Anyone else have
25 any thoughts on Active Mode Power? In that case, we will

move forward.

So this is a box and whiskers plot of Sleep Mode Power. I put this up here just to indicate that Sleep Mode is down to roughly about a half watt across different screen sizes and the means are relatively close, but you do have some high whiskers for the larger screen sizes. Go ahead, Mark.

MR. HOLLENBECK: Thanks. Just a quick comment about those higher values. We think that even when you're in sleep mode, the additional features still do draw additional power, and if you were to pull those out, you'd definitely be down a half a watt or less.

MR. BUTZBAUGH: Okay, thank you. Okay, do you want to unmute the lines and see if anyone on the phone has any questions or thoughts on Sleep Mode Power? Is this a question? It doesn't sound like it. And if you have questions, feel free to put them in the chat and we can pull those out of the chat and bring them up, as well.

So we asked about what additional features in hardware consumes energy and received a list going from high resolution monitors, USB, charging ports, touch screens, additional ports, and then, as well, camera, microphone, integrated speakers, ambient backlighting, and then we also had some numbers on the energy use increase from these different features, so high resolution

information we received indicated there could be more than a 50 percent increase in plug load after normalizing for other components. For the USB charging power draw about three watts, and then touch screen about one watt. And just wanted to see if this is what industry is seeing in the market, or if industry is seeing something else.

MR. HOLLENBECK: Hi, this is Mark again. Yes, we see that, you know, as you add additional features, they're going to consume more power. The thought that came to mind on the charging is that, you know, that's not something that's being used for an extended period of time. But certainly for features like higher resolution, you know, you're seeing that effect for an extended time. So it should be expected that these features would draw slightly more power. And the point is that when, should you move into a rulemaking phase, you know, you need to look at that and, as I've said all along, have specs for that in your regulatory framework.

MR. BUTZBAUGH: Thank you, Mark. Looks like no one else in the room has a comment on that. We'll check the phone lines again and see if we can hear this guy's conversation. And he's still going. All right, again, if anyone has comments, please put them in the chat box for us.

So we also asked for energy saving technology

1 features, features that improved energy efficiency of
2 displays. We received a nice list of different
3 technologies and descriptors. I just want to make sure
4 that we're not missing anything, so if anyone from
5 industry knows of any other energy saving technologies or
6 features that we may have missed, I'd love to hear about
7 them.
8 MR. HOLLENBECK: Mark again. We didn't have
9 anything specific that I think you missed. The one thing
10 I would suggest we look at if you get into the details of
11 a regulation would be to make sure that you don't do
12 something that rewards an individual proprietary
13 technology because that -- I know of one instance where
14 that can be an issue in the display area, and I don't
15 think you want to do that to where you make one technology
16 the sole provider.
17 MR. BUTZBAUGH: Thank you very much. So from
18 Adam Goldberg, he asks: "Did anyone consider the
19 differences between TFT and IPS LCD Displays?" And based
20 on what I've seen in our docket from responses, I have not
21 seen anything in there that discussed the differences
22 between these two technologies. But, Adam, I'd love to
23 see information if you have it, please feel free to submit
24 it to our docket if you feel that this is an important
25 thing for the Commission to consider, I'd like to read

some information about it.

MR. DONNELLY: Clancy Donnelly with Ecova, representing the California IOUs. We did in our proposal to the CEC have a little bit of information on the difference between IPS and TN LCD panel technology.

MR. BUTZBAUGH: Okay.

MR. DONNELLY: Which wasn't quite clear on the question, I don't think it's a difference between TFT and IPS, so….

MR. BUTZBAUGH: Okay. That's the -- I'm not sure if you can read it, but --

MR. DONNELLY: Yeah, we did have it in the comments that we submitted that are available online, we did have some information there.

MR. BUTZBAUGH: I'll take another look at that. Did you phrase it differently?

MR. DONNELLY: Oh, no, just the question is referring to -- it says the difference between TFT, which is the Thin Film Transistors and IPS LCD technology, where the big difference is between the TN, twisted pneumatic (ph) technology, and the IPS technology.

MR. BUTZBAUGH: Gotcha. Thank you. Great. We will move into Costs. So we received little to no cost data. We know from the responses that the IOUs are performing their own cost analysis. It's our

1 understanding that ENERGY STAR's guiding principles
2 require cost-effectiveness, and we'd like to understand
3 more about incremental costs attributed to energy
4 efficiency in displays if anyone has any thoughts or
5 comments on this particular subject.
6 MR. DONNELLY: Clancy Donnelly again with Ecova,
7 representing the California IOUs. We didn't present any
8 cost data for specific components. Some of the data that
9 we're using to do that, we're using display search data
10 which on the component level is proprietary, but we will
11 be rolling that up in our analysis and in our proposal to
12 CEC in the coming months.
13 MR. BUTZBAUGH: Great, thank you. Anyone else in
14 the room? So we have another question from chat from
15 Richard Amon (ph): "Is there any considerations on
16 battery powered displays like picture frames?" And just
17 to rephrase what Ken has said and others have said, we're
18 interested in as much information as possible, so battery
19 powered displays, if there's information out there that
20 stakeholders or interested parties want to submit to the
21 docket, we'd like to look at it. My understanding is we
22 haven't received much information on that, thus far.
23 Okay, looks like no one else has anything on costs.
24 So the last slide on responses for displays is on
25 Electronic Billboards. We received from one organization

1 called Ban Billboard Blight some information on the energy
2 use and energy costs of different billboards and the IOUs
3 circled the two billboards in the middle here that are
4 both 14-feet X 48-feet and just indicating the big
5 difference in energy use between these two. We'd love to
6 receive some more information on electronic billboards to
7 understand more about them. This was probably the most
8 informative graphic that we've received. If anyone has
9 more information on these, we'd love to receive it to
10 understand a little bit more about electronic billboards.
11 And if anyone has any comments on electronic billboards,
12 feel free to make it now. Noah.
13 MR. HOROWITZ: Good morning. Noah Horowitz with
14 NRDC. It would be interesting as we try and better
15 understand the electricity use of these billboards whether
16 or not they have dimming capability and if it's during the
17 day the backlight could use less energy, and that could
18 significantly affect the annual energy use of the
19 products. So in terms of the test method and the data,
20 let's make sure we're looking at apples to apples here, as
21 well. Thank you.
22 MR. BUTZBAUGH: Thank you, Noah. I'll check the
23 chat and see if anyone has anything. It doesn't look like
24 it.
25 MR. SCHINDLER: Hi, this is Bill Schindler for

Panasonic. Can you hear me?

MR. BUTZBAUGH: I can hear you, Bill.

MR. SCHINDLER: Great. The electronic billboards, these are -- the slideshow is a very large one -- are we talking about stadium signage? Outdoor reading stadium signage, really large displays where -- there really is no backlight there, actually. Many of them are using specific, you know, individual LEDs for each pixel.

MR. BUTZBAUGH: Yeah. We're looking at what you would see predominantly on the highway, but what you may also see in stadiums and other venues.

MR. SCHINDLER: Okay, thank you.

MR. BUTZBAUGH: Yeah, the majority of those are LED, you're correct -- from my understanding.

MR. SCHINDLER: Okay, thanks.

MR. BUTZBAUGH: All right, I'm going to hit on the Next Steps and the Process, but then I'm going to open it up for any other comments that anyone would like to make.

Just a reminder that we're going to open up proposals from June 10th to July 25th, interested parties and stakeholders are entirely recommended to submit a proposal on efficiency measures, or any sort of efficiency project that you'd like the Commission to undertake. A proposal template and guidance is forthcoming. Again,

1 this is where we are in the process, we're in between the
2 Invitation to Participate and the request for proposals.
3 And this is my contact information. And now we can open
4 up the mics for any final comments anyone would like to
5 make. Go ahead, Mark.
6 MR. HOLLENBECK: Thanks, Josh. Just a couple
7 points in closing on displays. I think it's fair to
8 reiterate the fact that, as we have in the past, that we
9 respond to voluntary measures and programs like the ENERGY
10 STAR program to drive us to be as energy efficiency with
11 our products as we can, it's a very competitive industry
12 and we do everything we can because ENERGY STAR is so
13 important as far as selling products, particularly to the
14 Government. We sell products, we design and sell
15 products, sell worldwide, and as Shahid noted, for PCs we
16 need the requirements to be harmonized. So if it still
17 becomes necessary to regulate displays in California,
18 unlike some have suggested using the ENERGY STAR 6.0 spec,
19 we would definitely prefer that the framework be based on
20 the ENERGY STAR 5. -- I think it's 5.1 -- for displays.
21 And I would mention that for other countries and regions
22 where they've decided that products like both PCs and
23 displays should be regulated, that has been the spec that
24 the Regulations have been based on, and E STAR 6.0 isn't
25 even complete, and so we feel it's a little early to be

1 using that as a basis for regulation.

2 And the last thing I would say, and it really

3 gets into the next phase for the rulemaking, and I think

4 Shahid noted this on PCs, as well, that we generally say

5 that, if you have to regulate these products further, you

6 want to target the bottom 25 percent of the market, the

7 least efficient products on the market.

8 MR. BUTZBAUGH: Great. Thank you very much,

9 Mark.

10 MR. KUNDU: Bijit Kundu with Energy Solutions on

11 behalf of the California IOUs. Just a point of

12 clarification. From what we understand, you know, I agree

13 with Mark, I think we should where possible, where it

14 makes sense, CEC should consider aligning with ENERGY

15 STAR; however, we feel that it should be aligning with the

16 currently effective spec, and it's my understanding that

17 the version 6 spec as of June 1st will take effect, or I

18 haven't gotten the effective date, but -- yeah, as of June

19 1st -- so as of June 1st, so we would support aligning

20 with the version 6 spec that will be in effect in a couple

21 days.

22 I just wanted to note also that, in some of the

23 slides you showed, you know, again, I agree with Mark,

24 ENERGY STAR has done a really good job in kind of

25 incentivizing the most efficient displays on the current

1 market; however, these programs are designed to
2 incentivize the most efficient displays on the market. We
3 do believe that there is an opportunity, that CEC has an
4 opportunity to incentivize implementation of cost-
5 effective, readily available, off the shelf market
6 technologies for the less efficient models; some of the
7 less efficient models can consume between three to six
8 times more energy than a more efficient ENERGY STAR model.
9 So we think there's an opportunity there to realize
10 significant savings in the State of California.
11 MR. BUTZBAUGH: Thank you. Doug.
12 MR. JOHNSON: Doug Johnson, Consumer Electronics
13 Association. Josh, is the CEC planning to commission any
14 studies itself between now and the end of the year? I
15 meant to ask this also for the computer category, but with
16 regard to displays, is the Commission planning to
17 commission research that would yield data?
18 MR. BUTZBAUGH: The only thing I'm aware of is
19 the power management study with Cow Plug.
20 MR. JOHNSON: Okay. That's the only one that's
21 in the pipe?
22 MR. BUTZBAUGH: That's the only one that I'm
23 aware of.
24 MR. JOHNSON: Thank you.
25 MR. DONNELLY: Clancy Donnelly with Ecova,

representing the California IOUs. I just wanted to state that we are currently conducted testing and analysis on the cost of implementing energy saving technologies and, you know, preliminary results show that there are several opportunities for these cost-effective measures in displays, you know, things like more efficient backlighting, more efficient management of the light through the display for LCD panels, and improved power scaling through matching up the intensity of the backlight to the video content, and other things like more efficient power supplies. And we will provide more detail in our proposal to CEC in the coming months.

MR. BUTZBAUGH: Great. Thank you, Clancy. It doesn't look like anyone else in the room has any final thoughts. Anyone on the lines, Peter?

MR. SCHINDLER: Bill Schindler.

MR. BUTZBAUGH: Hello Joel (*sic*).

MR. SCHINDLER: This is Bill Schindler from Panasonic.

MR. BUTZBAUGH: Hello.

MR. SCHINDLER: Hi. I heard some statements I think that perhaps ENERGY STAR displays 5.1 or even 6 would be used as a basis for this regulation, and I see an issue where ENERGY STAR, as we all know, designs their power limits toward the best 25 percent or most efficient

displays, and if this is a CEC mandatory standard, then the other 75 percent of the displays would not be eligible for sale in California, so I think there's kind of a -- there has to be some type of compromise there.

MR. BUTZBAUGH: Okay. Thank you, Bill, for that comment. I think Bijit has some thoughts.

MR. KUNDU: Bijit from Energy Solutions. I just wanted to clarify, and if this was the understanding I meant in regards to aligning with ENERGY STAR the ENERGY STAR framework, now ENERGY STAR treats different products and certain -- how they consider resolution and whatnot, in terms of the framework; the CEC, where possible, should align with the ENERGY STAR framework.

MR. BUTZBAUGH: Thank you.

MR. SCHINDLER: Great. Thank you for the clarification, Bijit.

MR. BUTZBAUGH: Any other last thoughts? Okay, in that case, that's it for Displays. We are going to have a break until lunch and then, at 1:30, we will begin Game Consoles. So please be here ready to go at 1:30 if you want to attend the Game Consoles session.

(Break at 12:42: p.m.)

(Reconvene at 1:33 p.m.)

MR. SINGH: Good afternoon, folks. Welcome to the Commission again. I just have one announcement to

1 make. I wanted to mention that we are recording this
2 workshop and the transcripts will be available in a few
3 weeks, and we will post these transcripts online for you
4 to look at it, so I just wanted to mention that. And with
5 that, I will hand it over to Josh to make his presentation
6 on Game Consoles. Josh, please. Thank you.
7 MR. BUTZBAUGH: Thank you, Harinder. So my name
8 is Josh Butzbaugh. I'm working with California Energy
9 Commission on the 2013 Appliance Efficiency Rulemaking,
10 and I'm going to discuss the results of the Invitation to
11 Participate for Game Consoles.
12 So this is our agenda for this session. I'm
13 briefly going to go through the purpose and information
14 requested, and then we'll spend more time on the responses
15 we received and getting feedback and input from
16 stakeholders on these responses.
17 So the purpose of the Invitation to Participate
18 is for the Commission to receive information and data from
19 interested parties to inform the Commission's policy
20 direction and process and, as I just mentioned, we're
21 going to go through Game Consoles today.
22 As you can see, we requested a wide breadth of
23 information from product definition and scope, to market
24 characteristics, and market competition. I won't go
25 through each and every topic of information that we

requested, I'm just going to discuss the ones that seem to be the most important ones based on the comments we received.

Can the folks on the line hear me? Okay. All right, I just mentioned that we requested a wide breadth of information and I'll be going through some of the most important topics in this presentation.

So responses, we received some really good responses from some organizations addressing the information we requested, and we appreciate all the responses that we received.

So the first topic is Test Procedures. We received information about a draft test procedure that the manufacturers are developing and we're interested to hear how that comes along. We also received information indicating that there are multiple test procedures and you can potentially use these different test procedures together, so for instance, power supplies through EPRI and Ecova, active mode through NRDC, and then EPA's Recognition Program for Auto Power Down and Modal Power. And I recommend that anyone submitting a proposal, please use the test procedures and use data from the test procedures that you are recommending in your proposal.

Go right ahead, Pierre. If you'd like to comment, feel free to comment on Test Procedures. I was

1 just mentioning it for the first topic.

2 MR. DELFORGE: Thank you. Pierre Delforge, NRDC.

3 I just want to open it up with one -- to get into the

4 thick of the discussion, we know we have the current

5 generation of consoles and we've provided a lot of data on

6 these consoles because that's what's available today, but

7 we also know a number of next generation consoles have

8 been announced and in one case it's already on the market

9 with the Wii U and for Playstation and Microsoft that's

10 just been revealed. From the information we have, there's

11 a new mode called Connected and Ready, or Active Standby,

12 whatever we're going to call it, which is not currently

13 covered by any of the test procedures listed here, and

14 which could become a very significant mode in terms of

15 energy use if that new mode, for example, uses anything

16 between six to 12 watts, 24 X 7, that would be 50 to 100

17 kilowatt hours a year in energy use, which could almost

18 double the energies to the console. So I think it's

19 important as we go forward that we bear this in mind and

20 we look at making sure that we include this in the test

21 procedures that we need going forward.

22 MR. BUTZBAUGH: Thank you, Pierre. And I should

23 also mention that, when it comes to standby and navigation

24 standby, if you're going to submit a proposal, please

25 define what you mean by standby. I know different devices

have different definitions for standby, and so we would just like to make sure that that's defined when it comes to the proposal stage. And that's basically how I was going to address Modes of Operation. So, again, this is everyone agreed in what the modes of operation are for these game consoles and if you're going to propose something that addresses standby or network standby, please define that mode.

So this is the information we received on power draw by mode, and this is for the Wii U, Xbox 360 S, and the Playstation 3, and it's my understanding this is based on the most recent versions of those game consoles. I'd like to hear from any interested parties or stakeholders as to whether they're seeing anything different than this for power draw by mode for these different modes, for these different products. So this is an opportunity for anyone to voice any input if you're seeing something different than this.

MR. WARNECKE: Good afternoon. I'm Mike Warnecke with the Entertainment Software Association and I'm pleased to be joined this afternoon by representatives from all three of the console makers.

On the specific question on the Power Draw by Mode, we're still analyzing the data, but generally we think this is a good start and that's where we're at right

1 now with the data.

2 MR. BUTZBAUGH: Great. Thank you very much,

3 Mike. Pierre.

4 MR. DELFORGE: Just one clarification. Under the

5 Wii U network standby, the 11 watts is really -- may not

6 be really a network standby consumption, it's actually the

7 consumption when the console -- and I'm sure a Nintendo

8 representative can correct me -- but there's a standby

9 when you download and install system updates, and we've

10 put it in here just because that was, you know, we don't

11 have a mode for that. And I think as you go forward, you

12 may have some evolution to that mode, so I just wanted to

13 flag that right now it's not really 11 for the network

14 standby, it's just a different activity that's similar to

15 that.

16 MR. BUTZBAUGH: Thank you. It doesn't look like

17 we have anymore comments from the audience. Do we have

18 any comments on the phone lines? If anyone on the line --

19 MR. LETTVA: Yeah, I have --

20 MR. BUTZBAUGH: Who is this?

21 MR. LETTVA: -- this is Dennis Lettva from UL

22 (ph). Like most TV preps, they have like a download

23 acquisition mode and for the 11 watts for the Wii U, we

24 just have like a separate mode for download acquisition

25 because I know PS 3 has a download acquisition mode, as

1 well, when there's a firmware update.

2 MR. BUTZBAUGH: Well, thank you very much. If
3 you have any more information on that, it would be great
4 if you could submit it to the docket, otherwise perhaps
5 those who are preparing proposals and want to think about
6 whether it makes sense to have a different mode for
7 download acquisition. Any other questions from the phone
8 lines? We'll move on to the next slide.

9 This is a bar chart on Media Play for the
10 different game consoles, as well as Apple TV, Blu-Ray
11 Players, and it indicates that Media Plays consumes more
12 power for certain devices than others, and if anyone has
13 any comments about this particular slide, please feel free
14 to go to the mic.

15 MR. WARNECKE: Thank you. Mike Warnecke,
16 Entertainment Software Association. So I think if we're
17 going to look at these figures, it's important to put them
18 into context to give the numbers a little bit more
19 texture. Most importantly, if you look at the high end
20 gaming notebook figure of approximately 30 watts, it's
21 important to keep in mind that, there, we're talking about
22 a device that is substantially more expensive than a game
23 console. You could be talking about a laptop that's from
24 $1,500 to $3,000, which is -- the previous generation of
25 consoles cost just a few hundred dollars. And so these

1 high-end gaming notebooks are engineered with processors
2 that are optimized for battery powered -- for use with
3 batteries. And as a result, they have certain features in
4 them that take advantage of the mobile environment. And
5 that might work great in a notebook situation, but would
6 not be cost-effective in a device priced for significantly
7 less. And so, when we're looking at that differential
8 there between the high-end gaming notebook and the
9 consoles, I think we need to keep in mind that broader
10 context.
11 I think it's also important, too, to keep in mind
12 that what's not on this chart is what the media or power
13 use would be for a PC, and as we heard this morning, the
14 power consumption for PCs is substantially larger than any
15 of the numbers that are even on the far right of the
16 chart, several times larger, as a matter of fact. So I
17 think if we were going to look at this from a full
18 context, we would need to have that graph in there, as
19 well.
20 Finally, I'd also like to say with the Apple TV
21 example, you know, there we're talking about a device that
22 does not offer gaming, and this is optimized for a
23 completely different purpose. So I just wanted to add
24 those further qualifications.
25 MR. BUTZBAUGH: Thank you, Mike. Anyone else in

1 the room have anything to add on Media Play? How about
2 anyone on the phone lines? It doesn't sound like it, so
3 we will move forward.
4 So Duty Cycle, this is the information we
5 received on duty cycle, and the duty cycle percentages for
6 the different modes. If anyone has any thoughts or any
7 information to discuss on or comment on for duty cycle,
8 please feel free. And I can also flip ahead to Usage
9 Profiles, as well, which is pretty similar.
10 MR. KASER: I'm Forest Kaser with Energy
11 Solutions, on behalf of California's Investor-Owned
12 Utilities. And I guess just one thing to note on this
13 Duty Cycle, I think it's been noted earlier today that the
14 duty cycle information here is based on a survey that is a
15 few years old and, as we've seen with the announcement of
16 the new consoles, we definitely see them being marketed
17 towards being able to do additional -- provide additional
18 kinds of functions like media play and streaming. So if
19 we have more current information, I think it would be
20 useful to see how the usage in those modes may actually
21 have increased since the 2010 survey.
22 MR. BUTZBAUGH: Thank you.
23 MR. DELFORGE: Pierre Delforge, NRDC. Two
24 points, one, just to build on what Forest Kaser just said,
25 we've heard and we actually had public announcements from

1 manufacturers, well, just from Microsoft, that the usage
2 of the console is now at least half, or predominantly
3 Media Play, and that's not reflected in these numbers, so
4 I think it's evolving and Media Play is becoming a more
5 important part of the duty cycle. We also need to make
6 sure that, as we move towards the next generation with the
7 different modes that I mentioned early on, connected and
8 ready, and this sort of thing, that this also gets
9 reflected in the duty cycle going forward. And last, I
10 think the source of this data is a survey by, you know, a
11 phone survey, I believe, from CEA -- Doug, you might want
12 to confirm -- and you know, I think there's a certain
13 amount of uncertainty in terms of what, you know, the
14 reality is it's not based on metered data, so I think we
15 need to take this with a little bit of caution in terms of
16 the accuracy of the results.
17 MR. BUTZBAUGH: Thank you, Pierre. Anyone else
18 in the room? Doug.
19 MR. JOHNSON: Doug Johnson, Consumer Electronics
20 Association. Yeah, just to pick up on what Pierre said,
21 it is based on the findings of our 2010 Energy Use study,
22 so again with that caveat that I mentioned this morning,
23 that is our existing study, it is three years old, we do
24 plan on revising that.
25 MR. BUTZBAUGH: Thank you. Noah.

1 MR. HOROWITZ: Noah Horowitz for the NRDC. Duty
2 Cycle is really important in terms of calculating annual
3 energy use cost-effectiveness and so forth, and there's a
4 real scarcity of metered data, so if you ask somebody,
5 "Did you turn your device off," they're probably going to
6 say yes in the survey, but in reality their behavior might
7 be different, as my colleague indicated. So the industry
8 probably has a lot of data in terms of how many hours per
9 day their consumers are using their products, and if that
10 hasn't been submitted to the record, it would be great if
11 we could have that actual metered use sort of data, you
12 know, how many hours per day is the device in "On" or
13 connected to one of their premium services. Thank you.
14 MR. BUTZBAUGH: Thank you. Okay, anyone on the
15 phone lines? In that case, we will move forward to the
16 next topic, Default Power Management Settings.
17 This is based on the information submitted into
18 our docket, and so it indicates that, between the Wii U
19 and the Playstation 3, they have a number of -- well,
20 Playstation 3 has a number of default settings, Wii U has
21 one, this has a footnote that says that Microsoft's Auto
22 Power Down may have been a glitch in this instance and it
23 has default power settings, as well. Does anyone have any
24 comments about Power Management Settings? And in
25 particular, does anyone know how many power management

1 settings the X Box 360 S is supposed to have?

2 MR. KASER: This is Forest Kaser with Energy

3 Solutions, on behalf of the California IOUs. And just to

4 clarify, those are number of hours that would elapse

5 before the Auto Power Down is activated, and so they're

6 not discrete settings, it's just actually the number of

7 hours, just to clarify.

8 MR. BUTZBAUGH: Thank you, Forest.

9 MR. CALLAHAN: I'm Tim Callahan with Microsoft.

10 We ship Xbox 360 with the exception of the glitch that

11 NRDC happened to get a hold of. The sets automatically

12 power down after one hour of inactivity.

13 MR. BUTZBAUGH: Thank you. Okay, we'll open up

14 the lines. Anyone on the phone have anything to discuss

15 about power management settings? Okay, we'll move

16 forward.

17 Power Supplies. This is information we received

18 on the Wii, Wii U, Xbox 360, and Playstation 3 for the

19 power supplies that they are packaged with. Does anyone

20 have any comments about these power supplies and the

21 efficiency levels that are indicated in this chart here?

22 So are these efficiency numbers -- do those look good to

23 everyone, I take it? Okay, anyone on the lines? No? All

24 right, I'm going to assume these numbers are accurate.

25 So these are Power Supply Costs that DOE produced

in its Technical Support Document for External Power Supplies and Battery Chargers. And it has these CSL levels, and CSL 0 is approximately 80 Plus Bronze, and then CSL 1 is 80 Plus Silver, CSL 2 is Silver, and CSL 3 is Gold, and these are the incremental costs that DOE is using. Does anyone have any thoughts on these numbers? And I'm also going to go through the numbers from the Green Technology Leadership Group submitted in its responses, as well, on this page; they're a little bit different, and so I'd like to know whether or not certain numbers are better than others, or if the Commission should weight these, or what the thoughts are from interested parties on power supply costs. All right, I don't see anyone in the room who wants to comment, so I guess we'll check the lines and see if there's anyone real quick who -- hello? Okay, I'm not sure if that's someone advocating putting power supply costs on packaging, or if that's someone talking to someone else, so I'm going to assume that was an error.

These are the numbers we received on the U.S. Installed Base, this is according to CA's market data. Do these numbers look good to the folks from industry in the room? Are these approximately what industry sees from their shipment numbers for Installed Base? These are U.S. numbers, by the way.

1 MR. WARNECKE: Generally, in ESA's filing, we had
2 indicated that roughly since the launch of the previous
3 generation through the end of 2012, we're looking at
4 approximately 117 million units sold of the home game
5 consoles.
6 MR. BUTZBAUGH: Okay, so perhaps it's slightly
7 bigger than the numbers and that would make sense given
8 the time that's elapsed since this study came out. So,
9 thank you, Mike. Anyone on the lines who -- any -- no?
10 Okay.
11 This is the Shipment information we received. We
12 received shipment information that gave from VGChartz. We
13 also received shipment information from the NPD Group.
14 They both look relatively close with some differences over
15 a few years. We could average this if interested parties
16 prefer, or we can pick one or the other if there's a
17 strong argument for one or the other, I'd like to hear
18 comments from the crowd on what people think about these
19 shipment numbers and whether or not they're
20 representative.
21 MR. KASER: Forest Kaser with Energy Solutions
22 and the California IOUs. And I guess I would just be also
23 interested if there are projections that industry groups
24 would be interested in sharing into the future. It's
25 definitely an exciting time for game consoles right now

1 and there's, with the new generation of consoles being
2 released, it would certainly help inform projects of
3 future energy consumption to have some sense of the future
4 shipments that industry is expecting.
5 MR. WARNECKE: Mike Warnecke, ESA. We're at an
6 inflection point right now with the industry transitioning
7 new consoles, as has been acknowledged, but we would not
8 be in any position to provide any projected sales at the
9 advent of this new generation.
10 MR. BUTZBAUGH: Okay. Thank you, Mike.
11 MR. DELFORGE: I'd like to bring up a related
12 point. In terms of lifetime, I don't believe you have a
13 slide on lifetime for game consoles, and the question is
14 whether, you know, the previous generation has lasted more
15 or less seven years from introduction to today, should we
16 assume that seven years is a an appropriate lifetime for
17 game consoles? And so that's the first question. And the
18 second is more of a comment, is that whether it's seven
19 years or different, it just shows, I think, you know, we
20 are at a critical point where we can still influence some
21 of the hardware architecture of some of these consoles,
22 and it's going to have impacts for the next seven years,
23 so it just highlights the importance of setting the right
24 levels and the right standards today. Thank you.
25 MR. BUTZBAUGH: Thank you, Pierre. Any other

1 thoughts on the shipment information or perhaps even
2 lifetime? How about on the phones? Doesn't sound like
3 it. All right, I'll move on to the next slide, then.
4 Incremental Costs. So it's our understanding
5 that game consoles are typically sold at a loss based on
6 the trends from anecdotal evidence, Xbox 360 and the PS3
7 improved those models as those models were retooled and as
8 they remained in the market, and based on anecdotal
9 evidence, the purchase price of the Xbox 360 and PS3
10 decreased as those models were retooled and remained in
11 the market, and so I'd like to get some thoughts on
12 incremental costs and what the costs are attributed to
13 energy efficiency of these products.
14 MR. WARNECKE: Thank you. Mike Warnecke,
15 Entertainment Software Association. I think this would be
16 a good point to explain a little bit how we get to the
17 energy efficiency significant gains that our industry has
18 made over the past few years. When the console makers
19 built these boxes, they're designing them to delight
20 consumers and take gaming to a completely different new
21 level, they're not merely incremental changes from one
22 generation to the other. And when they do this, it often
23 accompanies with brand new features, new ideas, new ways
24 of interacting with games, new ways of interacting with
25 media. And so there is a power overhead that's put in

1 there that allows these new features to happen, which
2 often require more power than earlier older features in
3 new functions. But the game industry, when they do this,
4 they have a platform that's basically locked for five to
5 seven years -- to your point -- and historically it's been
6 in that -- we can't speak to what the next generation is
7 going to be, but historically in the past, it's been
8 roughly five to seven years. That said, that duration,
9 it's not as if the consoles never updated. The consoles
10 updated periodically with incremental improvements.
11 And I know time is short and I'll get to the
12 question, the way we improve energy efficiency is through
13 shrinking the die, that's really the biggest gains for
14 energy efficiency with game consoles, and all three
15 manufacturers are incredibly diligent with that, in fact,
16 today's version of the current generation systems are
17 roughly half as much energy in game play mode and
18 substantially similar -- substantial reductions in other
19 modes over the past seven years. And so the way this
20 happens is, as the chips shrink and they get smaller, that
21 allows for all sorts of other good things to happen. It
22 means you can use less energy for fans, smaller chips mean
23 you don't have to have some of the other heat remediating
24 technologies. It also means you have lower shipping
25 costs. There's a whole bunch of things that console

1 makers have a definite financial incentive to do to drive
2 down the costs of the console, which has the added benefit
3 of increasing energy efficiency as a result. And this die
4 shrink is, we believe, the best opportunity to make those
5 changes and make meaningful substantial changes. However,
6 if you were to get beyond die shrink into some other
7 engineering things, then that becomes substantially more
8 expensive and the cost-effectiveness becomes questionable
9 in terms of our ability to really get gains, energy
10 efficiency gains out of that, that are going to be cost-
11 effective. So we think that the incremental costs for
12 improved energy efficiency, the best bet is with the
13 shrink die size, which our industry already does and will
14 continue to do because we have a financial incentive to
15 lower the cost while maintaining a locked platform to
16 enable software development to occur over a five to seven
17 year period in the past.
18 MR. BUTZBAUGH: Yeah, regarding the die size, is
19 it just that the price point isn't right upon initial
20 release and the price has come down due to innovation and
21 that's why these devices are retooled? Or are the prices
22 there upon launch, and then it's just a matter of timing
23 that they get retooled and -- so how does that work, I
24 guess?
25 MR. WARNECKE: Well, in many cases the technology

is not even there yet. The ability to shrink the die size, to smaller and smaller nanometers, that's dependent upon tooling and engineering challenges that may not have been solved yet; in fact, some of the changes that may occur in the generations that are launching this year in terms of whatever future incremental changes will be made may involve die chip designs that aren't even out there yet, they're not even something that's commercially feasible.

MR. BUTZBAUGH: Great. Thank you. Does anyone else have any thoughts on incremental costs and the cost of these technologies and efficiency? Anyone on the phone line? Doesn't sound like it.

All right, so I'm going to go through a couple more slides and then open up the mics for general comments, but I just want to mention that we're accepting proposals from June 10th to July 25th, and we will be releasing a proposal template and guidance in the next couple weeks, so that way folks have something to build a proposal from.

This is our graphic of where we are in the process. As you can see, we're between the Invitation to Participate and the Request for Proposals. And then this is my contact information, in case you have any questions feel free to call me or email me, if you have any

1 questions about putting together proposals or anything
2 involving this process.
3 And now I'd like to open up the mics for any
4 final comments that anyone has on game consoles.
5 MR. WARNECKE: Mike Warnecke with ESA. Again,
6 thank you for the opportunity to be here this afternoon to
7 discuss our industry. As ESA mentioned in our comments,
8 energy efficiency is something that we have been thinking
9 about for years and making significant strides in for
10 years through our business model that drives improved
11 energy efficiency through adoption of an APD mechanism by
12 default, and also through cooperation with other
13 stakeholders and other regulatory environments. In fact,
14 we worked for several years on the ENERGY STAR program for
15 game consoles, and although right now it's not in a stage
16 that we can implement, we do feel that there's a lot in
17 there that works and that we find to be a good approach.
18 Now, not everything, but I say that to make the point that
19 we're prepared to work with other stakeholders and with
20 other regulators in a way that's smart, in a way that
21 makes the energy efficiency work for the marketplace,
22 while also getting consumers more energy efficiency
23 devices. We just ask that, as we're continuing to go
24 forward with this and consider whether anything should be
25 done at the CEC level, that we keep in mind that there's a

1 real careful balance that has to be made here between what
2 can be done in a cost-effective manner versus the gains
3 that are already being made by the industry through other
4 means, and whether the incremental advantages to making
5 substantial changes to the current industry's business
6 model are going to create some complications for the
7 marketplace and for the viability of the industry's health
8 in the future. Thank you.
9 MR. BUTZBAUGH: Thank you. Is the EPA game
10 console recognition -- is that a cost-effective program,
11 would you say? I mean, what are your -- I notice you
12 mention that the manufacturers worked with EPA on that.
13 Would you say that that's doable on incremental costs?
14 MR. WARNECKE: What we can say about that is we
15 think that a lot of the definitions in their work, we
16 think that the APD framework is a good framework and we
17 can work with that. In fact, just about everything on
18 there, I think, we can work with; the one sticking point,
19 however, were the power caps. They were set at levels
20 that are not technically feasible for our industry to
21 implement, and they're certainly not feasible right now or
22 in the long term in terms of the impact that they would
23 have on innovation. And that really was the one issue
24 that precluded us from going forward.
25 MR. BUTZBAUGH: Okay. Thank you. Anyone else

1 have any final comments to say on game consoles? We'll
2 open up the lines and see if there's anyone.
3 MR. ZIVOJNOVIC: This is Vojin Zivojnovic
4 representing Aggios. We are an independent start-up
5 analyzing and developing car management technology. What
6 is troubling is the huge difference between the Apple PVHD
7 (ph) and the standard gaming consoles. And one of the
8 contributors was mentioning that these gaming consoles are
9 increasingly used as media flares, actually in the same
10 domain where Apple TV is. So the use cases are changing
11 rapidly in our industry, and I think this should be taken
12 into account in developing standards, developing expected
13 levels of (indiscernible). Thank you.
14 MR. BUTZBAUGH: Thank you for your comment. If
15 you have some information that you can share on that, that
16 would be great, or if you want to talk off line, I'd
17 appreciate that.
18 MR. ZIVOJNOVIC: We can talk off line probably
19 would be more interesting.
20 MR. BUTZBAUGH: Okay, thank you.
21 MR. ZIVOJNOVIC: Thank you.
22 MR. BUTZBAUGH: Well, if there are no other
23 comments, then we will end this game console session and
24 we will move to Set-Top Boxes next.
25 MR. SINGH: Thank you, folks. Since we scheduled

the Set-Top Boxes at 2:30, I think we'll take a 20-minute break and then start at 2:30 because some of the folks probably who may call later, so we have to wait for them until 2:30, so we'll take a 20-minute break. Thank you very much.

(Break at 2:11 p.m.)

(Reconvene at 2:31 p.m.)

MR. RIDER: All right, folks, I think I'm going to get started here. I just want to take the opportunity to thank everyone for sticking around. If you came here for Set-Top Boxes, you know, thank you very much, and thank you for waiting until this item arrived on the agenda. We wanted to wait briefly, as mentioned by Harinder, for any people who might be calling in at 2:30, we didn't want them to miss part of the presentation or discussion.

Again, my name is Ken Rider. I'm an Electrical Engineer with the Appliance Efficiency Program. And this presentation is on the ITP responses to Set-Top Boxes.

The purpose of this meeting is to go over the information received in response to the Invitation to Participate. This workshop marks the end of the ITP phase of the rulemaking process and the Standards Investigation process.

We asked for information from any and all

1 interested stakeholders on a broad array of topics and
2 background information, including scope, and cost, and
3 product lifetime. We'll be going over some of the more
4 important aspects of what we've requested in this
5 presentation.
6 We had a very good number of responses to the ITP
7 for Set-Top Boxes. I've listed on this slide the folks
8 that really gave some background information and data
9 specific to Set-Top Boxes. As you can see, there were
10 quite a number of them representative of the various
11 aspects of the industry, the IOUs and various NGOs such as
12 NRDC, and manufacturers of Set-Top Boxes.
13 So one of the things we asked about was the scope
14 -- what is a Set-Top Box? Some of the feedback we got
15 from stakeholders was we should look at a Set-Top Box as
16 it's defined in ENERGY STAR. We also received some
17 feedback that we should look at Set-Top Boxes as they are
18 being defined and developed in the DOE's NOPR, which is a
19 Notice of Proposed Rule, for a Set-Top Box test procedure.
20 We were also told to look at international standards and
21 also the definitions located in some of the primary test
22 procedures such as CEA 2043.
23 One theme that ran throughout all of the
24 responses was that set-top boxes are very complex and not
25 the easiest item to define in a scope, so we don't really

1 want to discuss it as this is more of a proposal issue,
2 but really want to emphasize for folks who are thinking of
3 submitting a proposal to the Energy Commission on how to
4 save energy in Set-Top boxes, that you be very clear about
5 what kinds of products you think that your proposal should
6 apply to.
7 We also received a lot of comments that focused
8 on preemption; I wanted to acknowledge that, but also
9 wanted to note that this preemption discussion is really
10 focused on proposals. You have to be proposing to do
11 something before a preemption conversation becomes
12 meaningful, so for folks, again, who are thinking of
13 proposing something, you might look at the preemption
14 items raised in response to the ITP, and we certainly will
15 when we review the proposals, but that is not something
16 that we should discuss without a proposal.
17 So the first important piece of information
18 related to Set-Top Box that I'd like to go over is the
19 U.S. shipment information. How many of these things exist
20 in the U.S. or California? And how many are being
21 manufactured or shipped every year?
22 The CEA study, again, as Doug has mentioned,
23 these are 2010 numbers, has actually kind of looked
24 comprehensively at all the estimates for Set-Top Box
25 Installed Base. There isn't a very large variation

1 between these studies, and it seems to -- it chose to use
2 a modified version of -- I don't know how to say it --
3 maybe it's Kagan or Kahgan (ph), something like that, and
4 the IOUs, I think, indicated that they are looking at
5 using the same numbers for an estimate of the Installed
6 Base.
7 DOE released a -- and we were pointed to this in
8 the ITP -- DOE has released a Notice of Data Availability,
9 which is what NODA stands for, and that NODA estimates
10 41.1 -- excuse me, 41.1 million Set-Top Box shipments --
11 and, again, this is nationwide -- in 2012. It also
12 contains projections about shipments going forward many
13 years, at least I think until 2020.
14 So for folks who weren't here earlier, I'm going
15 to bring up a few discussion points to kind of stimulate
16 conversation. Feel free to talk about other items that
17 are relevant, in this case relevant to U.S. shipments, and
18 instead of reading through one and then having people come
19 up and answer one, and then going to the next, I'm going
20 to read the discussion questions, all of them, and then
21 ask people to respond and they can respond to all, or one,
22 or none of these things.
23 So for U.S. Shipments, my questions are, are
24 these estimates of installed base and shipments
25 reasonable? Do they seem really off base to anyone out

there? There seems to be pretty good agreement, at least in terms of what we received in the ITP. Can these numbers be scaled by approximately 12 percent to estimate California market share? That 12 percent number would be akin to a population scaling, it's a rule of thumb that California is about one-eighth of the U.S. population, so I guess, really is population scaling reasonable to use on these national figures? So I'm going to open it up to people in the room first, and then I'll open it up to folks on the phone. Does anyone have any comments on the U.S. shipment or installed base data? Yeah, go ahead, Gregg.

MR. HARDY: Is this mic live, by the way?

MR. RIDER: I think so. You might have to tap it.

MR. HARDY: It looks like it's lit. So Gregg Hardy with Ecova, representing the California IOUs. I did want to point out that --

MR. RIDER: And bring the mic a little bit closer.

MR. HARDY: -- sure -- that the data shown here is somewhat dated. We'll be -- for the IOUs, we'll be working with more recent Kagan data and we do align with the proposed modifications, which basically scale down the total number of satellite boxes from what Kagan proposes,

and we've spoken with Kagan about that.

And the other thing I'll point out is that these numbers don't include cable DTAs, so that's an important thing to notice, which are something like 35 million units, in addition to these.

MR. RIDER: Anyone else? Go ahead, Noah.

MR. HOROWITZ: Noah Horowitz for the NRDC. I think ballpark these numbers look fine and look forward to seeing the updated data from the IOUs. I agree, DTAs are the 30 plus million set-top boxes that aren't in here and should be included. There is a trend, if the number of set-top boxes is relatively constant, the type of boxes is changing. More and more homes have a DVR. DVRs historically have used more energy than a standalone box. And we're starting to see clients increasingly installed, as well, so the mix of boxes is changing, it's not just the total number of boxes we should be looking at. Thank you.

MR. RIDER: Thanks, Noah. And I would note, too, that I think the DOE estimates show increasing numbers of -- at least in the short term -- set-top boxes. Also, on the Kagan, Gregg, what's the new year? What's the difference in terms of timing between --

MR. HARDY: What's the increase in the Kagan data graph?

1 MR. RIDER: Yeah, yeah.

2 MR. HARDY: I think it's 2012.

3 MR. RIDER: 2012 data? Okay, thank you. All
4 right, so I'm going to take control of the phone. So I'm
5 going to open it up in a moment here if there's no other
6 comments in the room to the phone, but I have to do some
7 fancy things first. (Pause) Just a moment, folks. Let's
8 do this, for folks who want to make a comment on the phone
9 for now, if you would mind typing your comment for the
10 moment until we work out how to switch these privileges?

11 So Adam Goldberg writes that we should consider
12 newer whole home set-ups such as Master DVR and Thin
13 Clients versus Legacy Everyday, TV has a DVR, the mix is
14 changing, so I'm assuming that the sales and shipment mix
15 is changing, and changing in a positive way in terms of
16 energy consumption. Thank you, Adam.

17 So I'm going to go ahead and move to the next
18 item.

19 MR. DULAC: This is Steve Dulac with DIRECTV. I
20 can add on to what Adam says and, just for the record,
21 DIRECTV and Dish Network filed some comments jointly to
22 this proceeding. So in some extent, I'm speaking on
23 behalf of both companies. And particularly with this
24 comment, what Adam Goldberg says is absolutely true in the
25 case of both DIRECTV and Dish Network, we are rolling out

whole home DVR solutions now, the DIRECTV solution is called "Genie" and the Dish Network solution is called "Hopper" and we're both installing them almost as fast as we can make those boxes, and on average we're seeing about 2.8 TVs installed per home, so that's consistent with the kinds of numbers that show up in this table here. And so the trend going forward would certainly be to a similar number of TVs supported on a per household basis.

MR. RIDER: Thank you. So I figured out how to unmute people, so I'm going to go ahead and unmute everyone. If you don't want to say anything, I would ask that you please mute your line. Okay, so anybody on the phone --

UNIDENTIFIED SPEAKER: Am I unmuted?

MR. RIDER: You are unmuted.

UNIDENTIFIED SPEAKER: Okay, let me try it the other way.

MR. RIDER: Anyone on the phone have any comments about U.S. shipments or Set-Top Boxes? Okay, I'm going to mute the lines.

All right, I'm going to move on to the next subject. So the next subject I'd like to talk about is Modes of Operation. We received comments that we should think about aligning with the ENERGY STAR's definitions of the various operating modes for set-top boxes. There's

also some different modes of operation. There's some differences between the current ENERGY STAR and what's being proposed in the DOE, in their test procedure, and in the draft CEA 2043.

The modes that are described in all of these three places are On or Active. Sleep -- a deep sleep -- and deep sleep only exists in the context of ENERGY STAR and not in the test procedures proposed by DOE or the Draft CEA test procedure -- and also Off. So the discussion points are: Is off-mode relevant at all? Does it describe a mode that exists? I believe DOE's duty cycle estimates, or their proposed test procedures estimate zero hours of use in Off, so is it a relevant mode at all? Will the lack of a deep sleep mode in CEA 2043 cause any issues in implementing the industry of Voluntary Agreement commitments to that mode? So the VA, the Voluntary Agreement, does discuss some goals and a roadmap to at least attempting to implement some deep sleep modes; will that be a problem if there's no way to test, or it's not defined in the DOE or CEA 2043? Are there any missing important modes? Is there anything that currently isn't described in these test procedures or ENERGY STAR as a mode that should be considered?

So I'm going to open it up to folks in the room to respond to those discussion questions, or any other

1 things they would like to talk about in terms of modes of
2 operation.
3 MR. DULAC: And this is Steve Dulac with DIRECTV.
4 So responding to the question, is off-mode relevant? No,
5 we don't think so. And the next question, this is very
6 important because this question actually is incorrect.
7 CEA 2043 does not lack the ability to test a deep sleep
8 mode. 2043 has something called Special Sleep modes
9 included in the descriptions, and a deep sleep mode is
10 encompassed in the idea of a special sleep mode. So 2043
11 does, in fact, presently have the ability to allow
12 measurements of a deep sleep mode. And I guess maybe I
13 should just add, in addition to that, 2014 has the
14 flexibility associated with its upgradeability as part of
15 the CEA technology and standards processes to adapt as
16 needs change, too. And so it could adapt -- in this case,
17 it doesn't need to, it's already prepared for that
18 measurement. And then, are there any missing important
19 modes from the perspective of DIRECTV? No.
20 MR. RIDER: Okay. So, but there's no definition
21 of a -- so you're saying that the special sleep modes
22 essentially would meet the needs of a deep sleep mode?
23 MR. DULAC: That's correct.
24 MR. RIDER: Okay. Thank you. Go ahead, Gregg.
25 MR. HARDY: Gregg Hardy on behalf of the

California IOUs. Within CEA 2043, and Gary can correct me if I'm wrong, this special sleep mode test, deep sleep within CEA 2043 is just considered a special case of sleep, so they're actually consistent. ENERGY STAR goes about defining what deep sleep is and naming a mode after it, but it's not inconsistent at all with CEA 2043, except that CEA 2043 doesn't call it something different than just a special case of sleep, so there's actually pretty close alignment there. And there's alignment with ENERGY STAR, as well. ENERGY STAR refers to this section of CEA 2043 that tests special case sleep mode Section 8.33, so all of those organizations have aligned around that CEA definition for testing deep sleep.

MR. RIDER: Gregg, is that alignment in both versions -- ENERGY STAR versions 3.0 and 4.1? Or is it only in the newer version?

MR. HARDY: I know it's in 4.1.

MR. RIDER: Okay.

MR. HARDY: And so that's what I'm speaking to, specifically. I don't know if it's in 3.0.

MR. RIDER: Okay, thank you.

MR. HARDY: And then I'll speak to DOE briefly. So DOE does not recognize a deep sleep mode, but there's nothing that prevents an organization like EPA from defining additional tests as they did in the case of 4.1

that do test for deep sleep. So there's no conflict there is my understanding. And I'll speak to some of these other questions, I guess, while I have the mic here.

So is there a need for an off-mode? My only thought about that is that I believe this test procedure applies to over the top set-top boxes, as well as Pay-tv set-top boxes, and there's some possibility that at some point in time an off-mode would be needed. I know that the CA 2043 defined the off-mode. I think if you're going to lay down a long term standard way of testing set-top boxes, it's useful to have it in the construct, even though it wouldn't be used by a majority of the Pay -- any of the Pay-tv set-top boxes today, so I don't see any harm with doing that and it aligns with industry's proposal on that. And those are all the comments that I had for the questions. I don't think there are any missing modes. Really, I see three really important modes, On, Sleep, and Off, with deep sleep as a special case.

MR. RIDER: Thank you. Go ahead, Noah.

MR. HOROWITZ: Noah Horowitz with NRDC. A little bit of background. Yes, there appear to be multiple test methods out there; the reality is they're 90+ percent identical, there are just a couple of differences mainly in how they treat sleep. In today's world, there's just one sleep mode. In the future, there might be -- I'm

1 using terms loosely -- a light sleep that saves a little
2 bit of power, and then a much lower power sleep state
3 called deep sleep or, in the CEA test method, another
4 sleep state. So I think everybody is aligning that they
5 want to do something about this, it's just coming up with
6 common language and putting it down on paper.
7 If there is a deeper sleep, how do you deal with
8 it? And ENERGY STAR, although this isn't per se a mode of
9 operation, ENERGY STAR says all you need to do is have an
10 On/Off button on the console or the remote, and that
11 constitutes a deep sleep, and we have some issues around
12 that which we'll talk about later on. In terms of an off
13 button, right now boxes don't have a true off button that
14 brings the power down to zero or something very close to
15 it. In the future, we want to at least encourage
16 manufacturers to consider doing that, so if the person
17 wants to go on vacation, you know, if it's in a second
18 home or a guest room where it's not used very frequently,
19 or on a Thin Client, it might be appropriate to have an
20 off mode and have an off button in that case, and we could
21 figure out how to deal with that in the duty cycle. Thank
22 you.
23 MR. RIDER: Any other comments in the room? I
24 think there are a few people that would like to talk on
25 the phone, so can I pass it back to you? Great. Okay,

Peter, if you would unmute the lines?

MR. GOLDBERG: Yes, sorry, I just went ahead and typed my comment, but I'll talk about it since you went to the trouble. In our comments to both DOE and to CEC, we described the possibility for scheduling a deep sleep mode, that is, at times when the device is unlikely to be used, times of day, to schedule a time to go into a deep sleep, which may take a fair amount of time to come out of, which shouldn't be a problem because few people are watching TV at 5:30 or 4:00 in the morning, or something. And I'm not sure exactly whether that's a different state, a different mode of operation as described in the slide, or rather just some sort of maybe special case of deep sleep or something, but I wanted to make sure we brought that up.

MR. RIDER: Yeah, thanks, Adam. And, again, this is something to really pay attention to in the context of the proposals, you know, if you just use the word "sleep" or "deep sleep," it's going to be very important to -- if you don't mean the general term as defined in ENERGY STAR, that you really differentiate what you mean by a deep sleep, and what functionality, what power consumption levels, you know, really get descriptive if you don't mean something that's just described in ENERGY STAR or one of these test procedures.

1 MR. GOLDBERG: Yeah, well, to be perfectly clear,
2 what I'm talking about is a lower than sleep mode
3 consumption, but what's different from what ENERGY STAR
4 described is it will take longer than the threshold to
5 transition from this scheduled deep sleep, or whatever
6 term we should use, to an On mode, but that the device
7 only does it during times of day when folks aren't
8 watching TV, generally.
9 MR. RIDER: Thanks, Adam. Anyone else on the
10 phone?
11 MR. ZIVOJNOVIC: This is Vojin from Aggios. I
12 liked the comment on the general procedure. Research has
13 for a long time established that there are actually three
14 perimeters: functionality, power and latency. And you can
15 see in the UCI, the W5S mode (ph), you know, latency plays
16 a big role in deciding which mode is acceptable, which
17 mode is not. So probably longer term we'll see many more
18 On modes and we'll see many more sleep modes. For
19 example, I can give you almost immediate example -- if you
20 have an Apple computer, you will have a dark wake mode,
21 it's a mode which wakes up your system for a brief period
22 of time for maintenance, and then it goes back into sleep,
23 similar to the On mode. So just a general comment. I
24 think research has very clearly said and shown the way of
25 function, power, latency, these are the three buttons,

1 three that can change, and it gives all these other modes
2 which we may need today and also in the future.
3 MR. RIDER: Thank you. Any other folks on the
4 phone? Go ahead and mute the lines and we'll move on to
5 the next topic.
6 So I'd like to talk about Duty Cycles,
7 specifically Duty Cycles of Set-Top Boxes. We received
8 information in responses in the ITP about what the duty
9 cycles of these products ought to be, or where there are
10 information about their duty cycles. The DOE's NODA,
11 again, that stands for Notice of Data Availability, and
12 their NOPR, have an assumed duty cycle, and that's the
13 same one I was referring earlier to that suggested zero
14 hours off off-mode usage. ENERGY STAR version 3.0 and the
15 newer version, I think, as well, has some assumptions
16 about duty cycle.
17 Also we've received an NRDC field study that
18 studied the usage of set-top boxes, and the CEA's 2010
19 Residential Energy Consumption Report also had some
20 estimates of duty cycle. In terms of discussion, some of
21 the questions that I had when reviewing all of these duty
22 cycles was: DOE and ENERGY STAR duty cycles assume auto-
23 power down would decrease the on-mode time by seven hours.
24 Is this accurate? So this is an assumption, I believe,
25 that there are at least seven hours of available time for

set-top boxes on average to be sleeping. Which duty cycle best represents average real world use for the set-top boxes in the market today? Are there are any particular one of these duty cycles or duty cycle from another study that really gets at the average real world use? Are there expected features or trends that may significantly change the duty cycle of set-top boxes? Are they evolving in a way where people are going to use them much more often, or less often? So I'm going to open it up to the folks in the room. Any comments on set-top box duty cycle?

MR. HARDY: I'll comment.

MR. RIDER: Okay. Go ahead, Gregg.

MR. HARDY: Gregg Hardy on behalf of the California IOUs. ENERGY STAR version 4.1 defers to the DOE duty cycle because ENERGY STAR uses the DOE test procedure and the duty cycle is baked into the test procedure.

MR. RIDER: Right.

MR. HARDY: And the DOE test procedure duty cycle is based on ENERGY STAR 3, so there's fairly close alignment there with respect to the duty cycle. The NRDC field study took sort of a guess at what client boxes might -- the ENERGY STAR duty cycle is an average duty cycle applied to all set-top boxes, all pay-tv set-top boxes, and therefore it's inaccurate in that we all know

1 that multi-room servers are going to be on more than Thin
2 Clients in second bedrooms, and so forth, but we for lack
3 of better data right now, we're using a consistent duty
4 cycle across all boxes with the exception that, you know,
5 of auto power-down and some other nuance that applies if
6 you have certain features in a set-top box, but not by
7 set-top box class per se. And so the NRDC study looked
8 at, you know, what we thought would be logical based on a
9 client server type of architecture within a home. But
10 there's no alignment, to my understanding, and momentum
11 around using that as a standard duty cycle for measuring
12 energy efficiency.
13 And then the CEA 2010 report was an excellent
14 check on the ENERGY STAR duty cycle, and the numbers they
15 came up with were, after going through a healthy logical
16 process of determining what the duty cycle would be based
17 on how many consumers actually used the power button on
18 the remote control to shut set-top boxes off, which ended
19 up being somewhere around half the people, they came up
20 with a duty cycle that was relatively close to ENERGY
21 STAR's, so in a lot of ways it validated what was in the
22 ENERGY STAR duty cycle. So I think there's fairly close
23 alignment among stakeholders that, you know, ENERGY STAR,
24 which is now based on DOE is a workable approach to
25 setting duty cycle assumptions and, of course, it would

always be welcomed to have more data, especially relative to these new multi-room architectures.

MR. RIDER: Thanks, Gregg. Anyone else in the room? Noah.

MR. HOROWITZ: Noah Horowitz, NRDC. I think as other speakers have mentioned, we are seeing a shift to whole home solutions so that main box that could be connected to the first TV, if you want to watch TV on your second or third TV, that whole home box needs to be on again, so that might have even greater hours of use. And as proposals are developed, we might want to think of having a different duty cycle for that box versus a regular DVR that's only serving one TV, for example.

On the counter side, the Thin Clients, that might have a much different duty cycle. It won't have the latency because it's not connected to the head end that could turn on almost instantly, and so those things might be in a deep sleep state and consumers will likely leave the power management features on. So those might be on very few hours per day, and a lot more hours per day on standby, and we want to encourage the low standby power in those devices, which should be easier to obtain than some of the other boxes in the home.

MR. RIDER: Thanks, Noah. Anyone else in the room? And, you know, you may approach the podium, of

1 course, if you're in the audience, as well, just to be
2 clear. Okay, we have a question from the chat. Louis De
3 Roches (ph) says, "Sorry, the NODA analysis uses -- oh,
4 clarification, the DOE test procedure NOPR assumes a duty
5 cycle. The NOPR analysis includes a distribution of usage
6 based on real world metered data from Nielson." Okay,
7 good to know. And I think Adam wants to speak. So we're
8 going to go ahead and unmute him.
9 MR. GOLDBERG: Are we unmuted?
10 MR. RIDER: Yes, we can hear you.
11 MR. GOLDBERG: Okay, so Noah noted that, in the
12 case where you've got a multi-room box and a Thin Client,
13 if you're going to watch TV on the Thin Client that has
14 the effect of probably turning on the multi-room box, as
15 well. So that might seem to increase the duty cycle, you
16 know, the on-mode duty cycle of the main box, but
17 something that we also need to consider is time of day
18 viewing patterns. I don't know how most people watch TV,
19 but around here, in the evenings it's very common that two
20 TVs are playing two different things, and so it may not be
21 that the main box is on more, but rather that the total
22 viewing time for the household consists of times when two
23 televisions are in use, or more, and one of them is on
24 Thin Client, and one of them is on the main box, yielding
25 a total power consumption less than what it would be if

there were two set-top boxes, even given the fact that it may be -- and I'd sure like to see a number -- it may be that the main box would be on a little bit more, although I'm not convinced of that.

MR. RIDER: So, Adam, just to recap and make sure I understand what you're saying, is that there's probably or likely overlap between the time that the main box and the client box would be in use, and so it shouldn't be necessarily just the additive duty cycle of the main box and the client boxes, but you'd need to consider the overlap.

MR. GOLDBERG: Yeah, so if you have -- in the old days, you had three TVs and three set-top boxes. If there was eight hours of television watched, it wouldn't matter really which box it was on, it would be eight viewing hours and the rest non-viewing hours. But in the case where, you know, some of those boxes require the other, you also get the advantage of having less boxes on per viewing hour because some of the viewing hours have the main box and one or two Thin Clients, which is less power than three boxes. You know? I think you got it right, but….

MR. RIDER: All right, thanks. Anyone else on the phone? You can go ahead and mute the lines.

MR. DULAC: This is Steve Dulac. I guess I'd

like to chime in on this topic of multi-room architectures.

MR. RIDER: Well, if it pertains to set-top boxes -- or, I mean to the duty cycle, yes.

MR. DULAC: Yes. And so I wanted to point out a couple of things, one is that I fully agree with what Adam was saying, we don't understand the pattern of when both boxes might actually be used to watch different TV shows, but in addition to that, you know, sometime in the maybe not too distant future, one of these server boxes might not actually even have any video outputs on it and be placed in another part of the house, so in that scenario that changes the dynamic, as well. So I guess really where I'm going with that is that, you know, there's still a lot to be learned in terms of how those scenarios play out and how they affect the duty cycle, and I think we do need to just follow that. Will there be good data available? That will change what we think should just be the baseline, which is let's just use ENERGY STAR 3. I don't think so.

And then just one comment about the DOE NOPR for the test procedure. I think there was pretty consistent responses to the DOE on this subject that they shouldn't even be trying to detail a duty cycle in a test procedure, that there was something that was more suitable for a Reg

1 or for, for example, an ongoing voluntary agreement so
2 that it could be modified for exactly the reasons we're
3 discussing, that things are changing and we need to be
4 able to have the flexibility to change them as we better
5 understand the viewing patterns. So I wouldn't use the
6 NOPR as a source where we're all agreeing that the numbers
7 that were put in the NOPR were just really responded to as
8 saying it's not even appropriate to have those numbers in
9 the NOPR. Thank you.
10 MR. RIDER: All right. Any other comments?
11 Okay. I'm going to move on to the next topic, which is
12 the Energy Consumption of Set-Top Boxes.
13 Again, there are several sources of energy
14 consumption. The DOE NODA really had a lot of detailed
15 information about the modal power and energy consumption
16 on various types of set-top boxes. There's the ENERGY
17 STAR Qualified Product List that also offers a view into
18 how much energy set-top boxes consume. The NRDC 2010
19 Field Study -- and I believe NRDC submitted in their
20 comments the background data to that field study -- was
21 provided. And then, of course, the CEA 2010 Residential
22 Energy Consumption Report also provided not only unit
23 energy consumption estimates, but nationwide energy
24 consumption estimates.
25 So the items for discussion -- so energy

1 consumption is up for discussion, but also a few other
2 points. CCTA and NCTA's comment directly challenges the
3 NRDC data and assumptions, just -- I believe that's a
4 reference to the 2010 Field Study. I think the challenge
5 is that it's not accurate for today's market, but we'd
6 like to ask, does it seem like a pretty good accurate
7 picture for 2010, which I think is what it was intended to
8 do? And also, which dataset most accurately represents
9 current energy consumption? So would the NODA be the best
10 source of data to get an idea of California set-top box
11 energy use, or the ENERGY STAR, or how should we go about
12 trying to characterize energy consumption in the state
13 related to set-top boxes? So anyone in the room? Go
14 ahead, Noah.
15 MR. HOROWITZ: This is Noah from NRDC. I managed
16 the NRDC study from 2010. We're still very confident at
17 the time the measurements that were made in the modeling
18 reflected the state as it was in 2010. Relative to the
19 criticism from some of the trade associations, we
20 completely agree that boxes have gotten better, or more
21 efficient since then, but in addition, our national energy
22 use in 2010 that we modeled, that might have even
23 increased since then because that's when we were at the
24 sweet spot when people were moving to DVRs and, in some
25 cases, one DVR per TV. And as Steve and others have

1 correctly indicated, we've since moved towards whole home
2 solutions and that trend should be coming downwards. So,
3 again, the data we had in 2010 we believe is completely
4 accurate for the time, and today's boxes are different,
5 and the mix of boxes is changing, too. To your last
6 question, we think, referring to the ENERGY STAR Qualified
7 Product List, or QPL, which is not all boxes on the
8 market, but those indicate those that meet ENERGY STAR and
9 that's whether it's 50 percent or more of the market, as
10 we understand it today. Thank you.
11 MR. RIDER: Thank you. Any other comments? Go
12 ahead, Steve.
13 MR. DULAC: I just wanted to -- I mean, I could
14 respond to the CCTA comments just because I read them, but
15 is there somebody here from there that would want to
16 respond to that? I don't know.
17 MR. RIDER: There may be on the phone line if you
18 want to wait for that. Did they provide a chat? Oh,
19 well, so, yes, we do have a response from CCTA on here.
20 Is that person also on the line? Can you unmute Paul and
21 see if he can speak? Oh, okay. All right, so there is a
22 response and we'll get to that, I want to get to the folks
23 in the room first, and then we'll get to this response.
24 And then after that, I'll check back with you to see if
25 there was anything you'd like to add.

1 MR. DULAC: Well, then I'll continue on the
2 second bullet. Again, this is Steve Dulac, DIRECTV. So
3 there's no question about which dataset most accurately
4 represents where things are because we have this thing
5 called the Set-Top Box Energy Conservation Agreement where
6 all of the major MSOs, Satellite, Telco manufacturers all
7 got together and committed to a 90 percent ENERGY STAR
8 version 3 commitments for starting this year, and as a
9 result that is the baseline against which everything else
10 should be measured. That agreement is in place, the group
11 is operating now, and so ENERGY STAR version 3 is exactly
12 the right baseline for where things are. Now, of course,
13 there are deployed products from ENERGY STAR version 2
14 timeframe and from pre-ENERGY STAR timeframe. ENERGY STAR
15 Set-Top Box Program only started in 2009, January 2009,
16 but in terms of even if that voluntary agreement did
17 nothing, and we all did nothing in addition to what's
18 already been committed there, we'll see all ENERGY STAR
19 version 3, as that will be the baseline product available
20 in the field. So there's just no question of the answer
21 to that second bullet. There is, going back up to the
22 top, the comment about the sources of set-top box energy,
23 I do want to point out that there is the previous version
24 of the ENERGY STAR QPL, Qualified Products List, the
25 version 2 had a hundred something products on it and so

there is very good data available for quite a few set-top boxes, even drawing from that earlier ENERGY STAR list. Those boxes, of course, are all out of production now, but they are in the field.

MR. RIDER: Thanks, Steve. Just a quick reaction. I think what the Energy Commission would like to be able to do is show the transition over time because we're interested in how the VA -- the Voluntary Agreement will decrease energy consumption from today. So I think I understand what you're saying, 2014 ENERGY STAR 3.0 list is going to really well characterize the market because of the Voluntary Agreement, but in terms of tracking how that transition impacts California and what the energy savings will be for the State of California, we need to understand what is out there right now that is going to not be there because of the Voluntary Agreement. So we need to understand what's getting transitioned into ENERGY STAR 3.0 that currently isn't ENERGY STAR 3.0.

Yes? Well, actually, I think Doug had raised his hand earlier, so --

MR. JOHNSON: Go ahead, Gregg. I'll raise my point after.

MR. HARDY: Gregg Hardy representing California IOUs. Our estimate is that the market is at something like 60 to 70 percent penetration of ENERGY STAR 3.0

1 boxes, so when we do rough estimates, we look at -- we
2 sort of do weighted average between ENERGY STAR 3.0 boxes,
3 and then we look back at the last published ENERGY STAR
4 2.0 dataset, which is, I think, August 2011, right before
5 they flipped over to 3.0, and just do a weighted average
6 to try to --
7 MR. RIDER: So if folks are 70 percent compliant
8 with ENERGY STAR 3.0, then shouldn't they all be ENERGY
9 STAR partners? Isn't ENERGY STAR 3.0 50 percent --
10 MR. HARDY: You've got some service providers
11 like DIRECTV that are, I think, much higher than that, and
12 then I think that there are others that meet the 50
13 percent requirement, but have just chosen not to
14 participate, but they're putting out highly efficient
15 boxes.
16 MR. RIDER: Thanks.
17 MR. HARDY: Yeah.
18 MR. RIDER: Doug.
19 MR. JOHNSON: Doug Johnson, CEA. Just to pick up
20 on Steve's discussion of the Voluntary Agreement and the
21 question of data and reporting. Built into the Voluntary
22 Agreement, of course, is a system for accountability and
23 transparency, and there will be a system in place for
24 annual reporting, field verification, auditing, that will
25 yield reports that will be useful for tracking the

1 progress and accomplishment of the VA.

2 I am interested in calculating the estimated

3 energy savings for California, but nationally when we

4 announced the Voluntary Agreement, we estimated that in

5 its first year, the savings would be approximately $1.5

6 billion once the commitments were fully realized. So I

7 think we can and we will produce an estimate, refined for

8 California, but there is a lot of savings to be had from

9 the agreement, and there is a system in place to

10 demonstrate that savings going forward.

11 MR. RIDER: Thanks, Doug. And I think I'll move

12 to -- are there any other comments in the room? I'm going

13 to try to unmute the lines so Paul can speak, and if that

14 doesn't work I'll read his comment. So if you wouldn't

15 mind, Peter? So, Paul, if you're on the line, we've

16 unmuted folks, and if you're able to speak? Paul? No.

17 Okay, if you could mute them for a second so I can read

18 this? So Paul writes -- this is Paul Glist from the

19 California Cable and Telecommunications Association and

20 the National Cable and Telecommunications Association.

21 "The slide asks if NRDC was correct in its assumptions in

22 2010. In the comments submitted by CCTA and NCTA, we

23 pointed out several areas in NRDC's assumptions, including

24 that set-top boxes did not consume power equivalent to a

25 refrigerator, that NRDC was incorrect in describing the

1 number and type of devices in a typical cable home, and
2 that NRDC omitted energy efficient devices like DTAs from
3 its analysis. These were inaccurate NRDC assumptions for
4 2010 and skewed the results. Given the positive changes
5 in cable device energy efficiency since 2010, and the
6 additional efficiency gains that will be achieved from the
7 pay-tv industry's Voluntary Agreement, the CEC should not
8 rely on the NRDC report." So, any other -- do you want to
9 open up the lines and then maybe we'll see if anyone else
10 had any comments. Anyone? The lines are unmuted if
11 you're on the phone line.
12 MR. OKADA: Hi, this is Derek Okada from
13 (indiscernible).
14 MR. RIDER: Hi, Derek.
15 MR. OKADA: Hi. Did I hear you correctly that
16 the estimated cumulative penetration for ENERGY STAR 3.0
17 product is about 50 to 70 percent?
18 MR. RIDER: I think I heard 70 percent from Gregg
19 Hardy. Gregg, do you want to respond to that?
20 MR. HARDY: I estimated 60 to 70.
21 MR. RIDER: Okay.
22 MR. OKADA: I think it was actually -- because we
23 were doing some initial exploratory work with a service
24 provider, we actually received a lower number, somewhere
25 below 30 percent -- actually below 20 percent for ENERGY

1 STAR 3.0, which actually makes sense because if you think
2 about the effective date in September 2011, that's about
3 less than 15 months ago, and so if you were going full
4 bore, you couldn't achieve more than 20 percent of the
5 cumulative stock that's already installed.
6 MR. RIDER: I see, so what you're saying is the
7 shipments are -- okay, I understand, so I think we're
8 talking about two different numbers; I think Gregg's
9 number is the number of boxes that are being shipped, new
10 boxes that are ENERGY STAR compliant, and I think what
11 you're talking about is the number of ENERGY STAR
12 compliant boxes in homes.
13 MR. OKADA: Correct. Thanks for clarifying that.
14 Yes, I want to make sure the clarification -- that
15 shipments do not equate to embedded saturation in the
16 market.
17 MR. RIDER: Thanks, Derek. Just one second. Are
18 there any other comments on the phone? Anyone else?
19 Going once? Okay, we have a few more comments in the room
20 again, so Noah, if you would?
21 MR. HOROWITZ: Sure, I'll be brief. I think
22 there is some confusion in follow-up conversations. We
23 need to distinguish between what it being sold today and
24 what its energy use is, and then what's already in place,
25 what's in the field. Some of the older boxes each year,

1 some of them will be retired, but we do have a lot of
2 older less efficient boxes in the field that will have a
3 different energy profile than the box you buy today. I
4 think there is emerging consensus that ENERGY STAR 3 will
5 soon be the typical box that's being purchased if the
6 industry VA follows through, and then, with help from
7 industry, let's figure out what the stock is. We agree,
8 the NRDC report was based on models in 2010, let's do a
9 bottoms up analysis of what the stock is. And just to
10 clarify, we never said a DVR or a set-top box was equal to
11 a fridge, we said if you take a typical DVR and a set-top
12 box, that is a refrigerator's worth of energy use.
13 Thanks.
14 MR. RIDER: It doesn't keep my food as cold, as
15 well. Steve, did you want to still add onto the NCTA or
16 any of those?
17 MR. DULAC: Yeah, I think I'd like to.
18 MR. RIDER: Okay, go ahead.
19 MR. DULAC: So -- because we all love that
20 refrigerator analogy because it got a lot of play in the
21 national press. So I just wanted to update the record for
22 the satellite boxes that are available today. And we'll
23 even give the ENERGY STAR refrigerator a break and use the
24 latest ENERGY STAR fridge in, I guess, the top 10 USA
25 list, so the ENERGY STAR fridge has actually already

gotten, oh, I don't know, about 15 percent more efficient than that last report, since the NRDC report, but in that same timeframe the satellite set-top boxes have gotten much more than 50 percent efficient, so the result is that this -- and this is typical for satellite at this point, which is a High Def DVR and actually a Client box, and so that you have actually HD and DVR service everywhere in the home -- we're at at least half of that brand new ENERGY STAR fridge where, you know, only two years after this report came out. So the change here is truly truly amazing and everybody should keep track of it, that the data is just right there in the ENERGY STAR QPL, you can see the results for those boxes today.

MR. RIDER: And it might be useful if we can work together to identify, I mean, there's a large -- there are some boxes in the ENERGY STAR database that are more modern and some that are less modern, if we could work together to kind of identify which ones are the latest models that we should be projecting as what's going to be implemented in ENERGY STAR 3.0.

I need to move on to the next topic, which is the lifetime of set-top boxes. We received some estimates for the lifetime from several stakeholders. The DOE NODA estimates an average of 5.7 years as the lifetime for set-top boxes. IOUs stated five to seven years. TiVo's

1 comment said five or more years, and also provided some
2 additional information that the model production lifetime
3 is about two years, meaning that a new model is designed
4 to replace the old model approximately every two years,
5 and also noted that the lifetime for boxes is likely
6 longer for non-retail set-top boxes. DIRECTV and Dish
7 provided an estimate of six to seven years. So I think
8 most of these estimates are kind of -- seem to be in the
9 ballpark of one another.
10 Are there any subsets of set-top boxes that
11 should be considered to have significantly longer or
12 shorter lifetimes than the averages presented here? Also,
13 the DOE NODA provides the most detailed estimate of set-
14 top box lifetime in terms of what we received in the
15 Invitation to Participate. Should stakeholders rely on
16 that information for their proposals? And any comments on
17 that, folks in the room? Doug.
18 MR. JOHNSON: Doug Johnson, CEA. I don't think
19 the NODA is a good resource to rely upon for several
20 reasons which will be made clear in comments that industry
21 will be submitting to the Department of Energy in response
22 to its NODA that was put out, I believe, in March of this
23 year. There's not a formal comment period associated with
24 the NODA, but DOE did invite comments from stakeholders on
25 the content of the material in the NODA. And there are

1 several deficiencies that are significant with respect to
2 understanding energy use trends in set-top boxes. As soon
3 as we submit those comments to the Department of Energy,
4 we will submit the same material for the docket here in
5 California.
6 MR. RIDER: Yeah, thanks, Doug. I was just going
7 to ask that, so that would be great if we could get those
8 comments, as well. Any other comments in the room?
9 MR. DULAC: This is Steve Dulac, DIRECTV. The
10 NODA number of 5.7 years, it made me laugh out loud when I
11 read it. And it really just points out something that we
12 should all keep in mind regarding the NODA, which is don't
13 confuse detail with accuracy or correctness. You know,
14 nobody in industry sort of has a stopwatch going, and as
15 soon as we get to exactly 5.7 years, suddenly we're
16 contacting our subscribers and pulling boxes out of their
17 homes. So that kind of a number is not indicative of how
18 the business really works. Often, if a box is working,
19 we'll leave it in that home, that's the first assumption
20 unless there's opportunities for upgrades and all kinds of
21 other things that can change. And the curve, if you think
22 of the curve of a life of a box, it's very flat, there's
23 lots of different things that can cause it to be
24 prematurely pulled and retired, or allow it to last for
25 some time. And that's sort of the basis behind that and,

1 you know, it's maybe six or seven years, and a large part
2 of that is because technologies change to such an extent
3 that something might be simply obsolete after that
4 timeframe, but it's not a hard stop at all, it's a very
5 flat distribution.
6 MR. RIDER: Right, and I think when I described
7 more detailed, I think it had an estimate of year by year
8 how many -- I think they call it a set-top box survival
9 rate, something like that -- and so I think they did have
10 a full curve, not just -- I think 5.7 was the average of
11 that curve.
12 Lewis says, "The DOE NODA assumes a lifetime…,"
13 that's what I was just saying, "…lifetime distribution
14 function ranging from one to 12 years with a median
15 between 5 and 5.5." I guess it doesn't assume an average
16 of 5.7 years, according to Lewis. Okay. Any other
17 comments in the room? All right, if you would unmute the
18 lines. You've been unmuted. If you have any comments,
19 you can speak up on the phone. Going once, going twice.
20 So the next important area of discussion is
21 around incremental costs of improved efficiency in set-top
22 boxes. Again, the DOE's NODA for set-top boxes does
23 characterize incremental costs for some specific
24 improvements to set-top boxes. These improvements
25 included improved chip power consumption and power

1 scaling, improved efficiency of hard disk storage, and the
2 improved efficiency of a set-top box is power supply.
3 Industry suggested that costs of the entire
4 network should be considered and that regulations may
5 require changes to head-end equipment. Would these DOE
6 improvements cause network infrastructure costs? Should
7 we be considering those types of costs for the
8 improvements in the NODA? And I think Doug kind of
9 responded to this a bit already: DOE is not requesting
10 public comment on its NODA and I want to emphasize that
11 CEC therefore welcomes initial reactions to the costs it
12 presents; because there is no formal comment period, the
13 only way for us to gauge industry's opinion, or reaction,
14 or differences, or even IOUs' or NGOs' differences with
15 those numbers is to have a conversation at the CEC or --
16 thank you to Doug, you know, that's exactly what we want
17 to see, is if you submit something to DOE, it doesn't have
18 to be the same letter, but at least let us know if you
19 have issues with this data so we can consider those.
20 So I'm going to open it up to folks in the room
21 for comment on not only if you have any other comments on
22 incremental costs, as well, for set-top boxes, but I'm
23 going to open it up to discussion on the NODA and the
24 network costs, and costs of improved efficiency, in
25 general, for set-top boxes. So anyone in the room have

1 comments? Steve.

2 MR. DULAC: This is Steve Dulac, DIRECTV. The
3 NODA has only been out for a fairly short time, so we
4 really haven't had a chance to really understand it and,
5 in addition to that, it's not annotated well enough to
6 understand exactly what technologies are underlying some
7 of the cost increments that went into it. I can just
8 comment on the perspective of DIRECTV in looking at it and
9 guessing as best we could at what it was attempting to do.

10 We looked at it for the three main boxes that
11 really are relevant to DIRECTV come the end of this year,
12 that's our Genie Server, like I mentioned before, the HR
13 44, the client that accompanies that, the Genie Client,
14 which is called C41, and then in addition to that we've
15 got a basic high def box called H25, and we think we found
16 the equivalence to each of those three projects in the
17 NODA.

18 And I guess let me just take them in order here.
19 For the Genie server, they're showing that with some
20 amount of cost deltas, the typical energy consumption at
21 some point in the future could get down all the way down
22 to 99 kilowatt hours per year. Our HR44 is currently at
23 167. The trouble with what we've been able to glean from
24 their analysis is that they're assuming that the hard disk
25 storage is moving to a more efficient 2.5-inch

1 replacement. Unfortunately, a 2.5-inch drive does not
2 meet our performance requirements. It could simply not
3 stream in and out enough high def video feeds in order to
4 work. So it would be great to have a box running at 99,
5 but in our case that would mean that the box wasn't
6 working. And that's not acceptable for us. And so we
7 think that this just suggests that maybe the assumptions
8 that were made in terms of whether or not you could swap
9 out a more efficient drive needs to be thought through a
10 little more carefully, and it's just simply not a valid
11 case to use.
12 Moving on to the Genie Client, that's the C41,
13 the NODA analysis seems to show that with incremental
14 costs and adding a lot of new technologies, they'll be
15 able to get all the way down to a TEC of 43. If they had
16 checked the ENERGY STAR QPL, they'd see we have a box at
17 40 already, so, once again, you know, they're adding
18 costs, looking deep into the future, and predicting a
19 number that's actually higher than something we already
20 are producing. Again, it shows some sort of -- maybe not
21 a being in touch with what was available or perhaps just a
22 sense of how quickly the industry moves, and just how
23 assumptions can be obsolete very quickly.
24 And then speaking of obsolescence, the last case
25 is a box that's equivalent to our H25. We currently

1 produce H25 with a TEC of 83, and their analysis shows
2 that that could get all the way down to 61 with the issue
3 there being that that box is really a box of interim use,
4 it's no longer needed now that we have our server client
5 architecture, that box is being phased out and in the next
6 handful of years we won't be purchasing anymore, so it's
7 not relevant, again, to an analysis of this type. So for
8 us, NODA is more standing for sort of naiveté and
9 obsolescence more than it standing for a Notice of Data
10 Availability. But, again, this is very first impression,
11 we don't have a lot of the detail of what's behind that,
12 but just for the three boxes that are DIRECTV's bread and
13 butter in the future, it missed the mark.
14 MR. RIDER: Thanks, Steve. That was a great
15 response. Any other comments in the room? Okay, not
16 seeing any, Peter, if you could unmute the lines? All
17 right, the lines are being unmuted if you would like to
18 comment on Incremental Costs and you're on the phone,
19 please feel free to speak. All right, go ahead and mute
20 them.
21 MR. OKADA: This is Derek from (indiscernible).
22 I think when we're talking about incremental costs, are
23 you talking just about the manufacturing costs or the
24 current position solution? Or are you talking about
25 future (indiscernible)?

1 MR. RIDER: Well, in referring to the NODA, I
2 think the technologies are current, but I think
3 incremental cost is, I don't know, can you restate that?
4 I think maybe I didn't follow your point.
5 MR. OKADA: Well, let me recap my question
6 because I think it assumes (indiscernible), sorry.
7 MR. RIDER: Okay. I like to scare away
8 questions. All right, any other comments on the phone?
9 All right, you can go ahead and mute them. So I'd like to
10 open it up for general comments on any of the data that we
11 received, or information we received in the ITP for set-
12 top boxes, or any other general comments folks who have
13 attended this meeting would like to make at this time. So
14 I'm going to open it up to folks in the room if anyone
15 would like to make a comment on set-top boxes, general
16 comments? Okay, go ahead, Doug.
17 MR. JOHNSON: Doug Johnson, Consumer Electronics
18 Association. Since the time that public comments were
19 collected from the ITP process, the CEA 2443 Standard was
20 approved by its Standards Development Committee, and now
21 the Standard moves on to the review process. This
22 happened, I think, on or around May 17th of this month,
23 but it's just an update to the CA 2443 Standard that was
24 referenced earlier in the presentation.
25 MR. RIDER: Thank you. That's good news.

1 MR. STEVENS: Charlie Stevens with the Northwest
2 Efficiency Alliance. I didn't know where to put this in
3 your line-up, we weren't able to meet your ITP deadlines,
4 but we do have some field data on this and a whole bunch
5 of other consumer electronics, including the televisions
6 and the game consoles and the set-top boxes that all go
7 together, and it's all done with demographics, and it's
8 done with time stamps, with time intervals, I think, that
9 are short enough that you can probably identify what's
10 going on with the various devices, and figure out who in
11 the house is watching what and where. So we're going to
12 provide that to the Commission as soon as it is assembled
13 in a form that we can share it with you as probably a
14 database.
15 MR. RIDER: Great. Thanks, Charlie. And I think
16 that makes sense to reiterate the fact that we're open to
17 data and additional information throughout the entire
18 process, and so whenever you get that data, we'd sure
19 appreciate seeing it. Any other comments in the room?
20 Noah.
21 MR. HOROWITZ: Yes. A lot of the conversation
22 was what is the energy use of boxes that are installed
23 today, and while I think we've got pretty good clarity on
24 what's being sold today, it would be great if industry
25 could provide data on the energy use of the boxes that are

currently installed. We heard from CEA and Doug Johnson that there is potential savings of $1.5 billion per year, which is very impressive, that there must have been some assumption of what boxes are in the field today, so let's see that data and that will inform the rulemaking going forward. Thank you.

MR. RIDER: Thanks, Noah. Any other comments in the room? Okay, go ahead, Gregg -- or Steve, go ahead.

MR. DULAC: I just wanted to again sort of put in a plug for the VA, like Noah mentioned, and I think we do have an analysis that shows where that $1.5 billion comes from; in fact, I think it was toned down for the press release, and based on the analyses that were, I think, pretty well vetted through the larger community. So something that certainly can be brought into the record here.

I just wanted to say that, you know, the value of something like the Voluntary Agreement is really in the ability for us to continually be assessing where things stand, how things are going, and be able to keep adjusting and resetting that roadmap on, and basically on an annual basis, that's the way that the Volunteer Agreement is structured and a reporting and a revisiting of our obligations on a regular basis, it's kind of akin to what we're already doing, we all get together down at Cow Plug,

1 the same group of people practically that are in this room
2 and on the phone, we get together and assess. And much of
3 the information that I shared, the NODA is brand new, but
4 the information about those boxes was all presented, for
5 example, by Gary Langille down at the Cow Plug's last
6 workshop earlier this month. So we think that's a great
7 process, a great way to communicate. That voluntary
8 format works very well for industry and we're hopeful that
9 that way of working together can be embraced by the
10 California Energy Commission and everybody else. Thank
11 you.
12 MR. RIDER: Thanks. And I appreciate also, you
13 know, I think Doug spoke to this, you know, we need -- we
14 would like to try to characterize exactly what it will
15 mean for the State of California, specifically, so any
16 help that you can provide in penning that analysis down
17 from national to California would be helpful. Any other
18 comments? Gregg, did you have something?
19 MR. HARDY: Sure. I just wanted to spend a
20 minute putting energy consumption trends into perspective
21 here. As CEA comments point out, the efficiency of set-
22 top boxes has improved dramatically over the past decade.
23 The average unit of energy consumption through, say 2012,
24 stayed flat as consumers shifted from standard def boxes
25 that did not have hard drives in them, to high def DVRs

1 that were very highly featured, and it's a remarkable feat
2 of increase in energy efficiency, it has to do with
3 Moore's Law and the improved silicon and die shrink, so a
4 lot of the conversation we had about game consoles. So,
5 you know, you may ask the question, well, why then -- what
6 savings are there to be had through a regulation? And the
7 answer to that, I think, is that if you look at the market
8 today, there are some boxes that are significantly more
9 efficient than other boxes, and I'd point to DIRECTV's
10 Genie box and their multi-room architecture as an example.
11 So the Genie could serve multiple clients throughout the
12 home, it's a fully functional DVR, and it runs with an on-
13 mode power of less than 20 watts. And so there are other
14 DVRs out there that use -- and that's a satellite box you
15 have to compare, you know, satellite to satellite, cable
16 to cable, but there are in the market some boxes that are
17 significantly more efficient than others. There are boxes
18 coming out now that are compliant with the next generation
19 of ENERGY STAR spec, the version 4.1 that's not finalized
20 yet, but there's a draft out there. So there's an
21 opportunity to get -- and then there's the Voluntary
22 Agreement which has made a tremendous contribution to
23 getting boxes to the 3.0 level, which per the agreement
24 they will be starting at the last day of this year, so
25 really going 2014 and forward. But there's an opportunity

1 to move all the boxes towards levels that you can see in
2 the market today with today's technologies. And so that's
3 the case. But you can't deny the fact that the industry
4 has been moving quickly.
5 MR. RIDER: Thanks, Gregg. Anyone else in the
6 room? Okay, why don't you unmute the line real quick and
7 we'll take people on the phone line, and then I'll get
8 that chat loaded up. Anyone on the line, you're unmuted
9 if you'd like to speak.
10 MR. ANDERSON: Ken, this is Douglas Anderson (ph)
11 from CIA (ph).
12 MR. RIDER: Hi. Go ahead.
13 MR. ANDERSON: I just wanted to make a quick
14 comment about the technology contracts that we're seeing
15 with set-top boxes and this applies to network equipment,
16 as well. One of the things that we've seen right now is
17 the development of the industrial internet, and so
18 basically this is the idea of the connected tone where
19 everything is connected to a sensor, and so you can
20 basically manage everything from, you know, all your
21 connected devices from one point. The concern that we
22 have with applying a regulation to ITT equipment is not
23 just with that, but it evolves very rapidly which is a
24 concern, but also that we continue to see convergence of
25 technologies into one piece of equipment. And so the

1 analogy that I think is best for set-top boxes is the
2 mobile phone. You know, 20 years ago no one would have
3 thought that a mobile phone would be able to do things
4 like blood tests, you know, EKG readings, all these
5 different things that it can do today. If we would have
6 put the mobile phone in the same exercise 20 years ago, we
7 could have potentially killed the smart phone. And so
8 that's the concern that I just want all the stakeholders
9 to be sensitive to, is that as you're looking at these
10 set-top boxes, the Voluntary Agreement, that leaves the
11 door open for the companies to continue to enter and start
12 connecting different things, you know, and creating this
13 smart phone for the connected home. If we go in and start
14 saying, you know, "a set-top box can only use this much
15 electricity from now on," we really risk basically killing
16 convergence of a lot of different single function items,
17 and that's a broad industry concern that we have with the
18 context of this going on, but the development of this
19 internet of things is you could very well do that if you
20 set the energy use at a certain level with no flexibility.
21 And so I just wanted people to keep that in mind as we're
22 looking at this, that the stakes are very high in terms of
23 the innovation costs that could take place.
24 MR. RIDER: Thanks. Anyone else on the phone?
25 Okay, If you wouldn't mind muting? So, Gary Langille

1 actually submitted a comment in chat related to the
2 Incremental Costs and the NODA. I'm going to read it, but
3 I'm not reopening that discussion, I just am going to read
4 this into the record. He had a comment on the NODA: "The
5 background assumptions…" -- and again, this is Gary
6 Langille -- "The background assumptions for the NODA have
7 not been published, so it's difficult to assess the NODA.
8 However, the market dictates different behavior than is
9 predicted by the NODA. For instance, a whole house DVR
10 design may allocate $80.00 to $100.00 for the largest hard
11 drive money can buy. We would not stay with the same
12 capacity and realize the reduced energy consumption as
13 predicted by the NODA. Customers want more storage always
14 and…," I forgot what "MVPD" stands for, "…but basically a
15 service provider will strive," but he said "MVPD", "…will
16 strive to satisfy that need. We are already using level 5
17 external power supplies and, in some of our latest whole
18 house DVRs, we are already moving to a 90 percent or
19 better internal power supply efficiency, yet we are not
20 coming close to the energy reductions predicted by the
21 NODA."
22 All right, with that I'm going to move on. Oh,
23 Gary, go ahead.
24 MR. FERNSTROM: Ken, it's Gary Fernstrom
25 representing PG&E. We've been going for a long time and I

thought with respect to multi-functionality, I would try and add a little levity to the discussion and that would be, I'm not sure how the energy use of my set-top box compares to my refrigerator, but it does a pretty good job of keeping my coffee warm.

MR. RIDER: Okay. I'm going to quote that later in the rulemaking in the process, speaking of which, I'd like to talk about what the Next Steps are. Were there any other folks in the room?

Okay, I would like to talk about the Next Steps in terms of the process. This marks again the end of the ITP portion of the process. We're going to transition into Request for Proposals. So given all the background information received in the record, or additional information that folks may have, how can the Energy Commission improve energy consumption in set-top boxes? The comment period in response to that Request for Proposals will be from June 10th to July 25th. We will be issuing a proposal template to help guide stakeholders on how to make a wide range of different types of proposals. And again, I would like to really emphasize that Commission staff are available to discuss questions about the process, or this template, or concerns about any aspect of this proceeding.

Just a graphical representation of where we are

in the process, we've just finished the invitation to participate and, again, are moving into the Request for Proposals, as you can see very -- still early in the process.

Here is my contact information. Feel free to call me or email me with any of those questions. So that concludes the presentation on set-top boxes. We've gotten out a little bit early, but I'm going to keep with the time on the schedule. So we have on the agenda a break until 4:15. Please return by that time and we'll see you then.

(Break at 3:54 p.m.)

(Reconvene at 4:17 p.m.)

MR. RIDER: All right, welcome to the last presentation of the day, it's on Network Equipment. I'm Ken Rider, I'm an Electrical Engineer with the California Energy Commission. And I will be giving this presentation.

Here's a quick view of the agenda for what we will be discussing for Network Equipment. Again, the purpose of this workshop and this ITP in general is to get information to inform the Commission policy. Good policy comes from good information, so we're really taking the time to get not only all of the information possible from stakeholders, but also in this workshop feedback on that

information.

In the Invitation to Participate, the California Energy Commission asked for a broad array of information ranging from scope, to cost, to product lifetime, to sources of test data, and we're going to take a kind of narrowed view of all this in discussion today.

We received a fair amount of responses for Network Equipment. I've put the folks that submitted some background information and data on this slide; thank you very much for your participation, we really appreciate the feedback and information to this process.

So we received a lot of comments around the scope of network equipment. The IOUs suggested harmonizing the scope with the ENERGY STAR's draft small network equipment specification. The NRDC pointed to some additional reasons to look at this because of kind of blurred lines between set-top box and network equipment where set-top boxes are also wireless gateways and routers, they have network capabilities. And additionally, there is some overlap in pay-tv infrastructure devices.

TIA, Cisco Systems, Verizon, and ITI TechNet suggested network efficiency should not be considered at all. And TIA further elaborated specifically, in addition, that "enterprise and carrier grade" commercial equipment should not be considered in this proceeding.

1 Just to put this all into perspective in the
2 process, this will conclude the ITP portion of Network
3 Equipment, but we still plan to move forward in the
4 proposal phase for all of the subjects that we requested
5 information on from the ITP, including Network Equipment.
6 So we're not planning on removing any items from this
7 process yet, and still plan to move forward in the Request
8 for Proposal phase with Small Network Equipment.
9 Again, folks should take into account the
10 comments submitted relative to the scope in their
11 proposals, such as whether we should be looking at
12 commercial equipment, or what TIA references as
13 "enterprise and carrier grade" equipment, and whether we
14 should harmonize with ENERGY STAR's definitions and scope
15 for Small Network Equipment.
16 We'd like to take the opportunity to discuss U.S.
17 shipment information. The majority of shipments and sales
18 and background information provided were for modems,
19 routers, and gateways; there's more information than that
20 in the ITP responses, but consistently across the data
21 received, there was good information on modems, routers
22 and gateways. NRDC's comment estimated that 135 million
23 residential network equipment units were installed in the
24 U.S. in 2013, again, I think that means modems, routers
25 and gateways. The CEA comment also estimated, well, in

1 specifically the 2010 residential study, estimated 136.8
2 -- that should say "million" -- residential units
3 installed in the U.S. The IOUs estimated 5.5 million
4 units of residential network equipment purchased in the
5 year 2013, so this is a little bit different, this isn't
6 installed base, but rather shipments, or purchases, or
7 sales.
8 So for folks that are just joining us on the
9 line, I'm going to take comments from folks in the room
10 first, and then move to folks on the phone. I'm also
11 going to read a few discussion questions and topics to try
12 and stimulate responses from interested stakeholders. I'm
13 going to read all the discussion points, and in this case
14 there's only one, but in other slides there are multiple,
15 and I'm going to read them all and allow people to respond
16 to all of them at one time, rather than going one by one.
17 So with that, the discussion point I have for the
18 U.S. shipment information on network equipment is, what
19 portion of these units are leased? And do all leased
20 network equipment have pay-tv set-top box-like
21 functionalities? And I'm going to open it up to the folks
22 in the room. Actually, let me elaborate on this a little
23 bit more. I'm wondering if there's a very clear-cut
24 difference in the market in terms of what types of units
25 are sold and exist in pay-tv space versus retail space.

1 Any comments? Noah?

2 MR. HOROWITZ: Noah Horowitz. I don't have

3 specific percentages, but when someone signs up for high

4 speed internet, they either get the modem from their

5 service provider, which might be their phone company, or

6 their cable company, or some other third party, or they go

7 to a store like Radio Shack or Best Buy and physically buy

8 the modem. In terms of the router, it's more common for

9 the consumer or the user to buy that from a store, rather

10 than getting it from their service provider. Sometimes

11 those two capabilities are blended into one box,

12 generically referred to as a gateway box, and that gateway

13 box may be provided by the service provider or by the

14 retail. The industry probably has better numbers on what

15 the split is, and we welcome that from them.

16 MR. RIDER: And then in terms of what you were

17 just saying, is provided by a service provider, are those

18 typically leased? Or are they actually selling -- do the

19 people receiving the service actually own those pieces of

20 network equipment?

21 MR. HOROWITZ: Sometimes when you sign up, you'll

22 get that box for free, sometimes you have to pay for it,

23 sometimes it's owned by the service provider, there are

24 all different varieties of that. Towards your second

25 question, some of this network equipment is totally, even

1 though they might get service, let's say, from Comcast,
2 they might just be getting a modem and only be signing up
3 for data service, and you cannot get pay-tv through that
4 modem, for example.
5 MR. RIDER: Thanks, Noah. Any other comments to
6 shipments, in general, or to these questions? Go ahead,
7 Gregg.
8 MR. HARDY: I'll comment about your second
9 question, which is that there are multi-function boxes in
10 development and some deployed that have both set-top box
11 capability and some networking capability, and we don't
12 consider those network equipment, we consider those set-
13 top boxes with networking capability, so a multi-function
14 set-top box. And that's consistent with our read of
15 ENERGY STAR definitions, and I know that there's an effort
16 within the community, ENERGY STAR and industry, to clarify
17 those terms: what's the difference between a gateway set-
18 top box versus a networking set-top box? But our basic
19 assumption is, if it's got set-top box capability, it's a
20 set-top box. Now, that said, cable modems even are an
21 important part of the pay-tv system in that, if you're
22 watching content streamed from your service provider to
23 your iPad, it's going through your cable modem and then
24 whatever local access networking equipment you have, a
25 WiFi router, and then to your iPad. So it can be an

integral -- networking equipment in general can be an integral part of the pay-tv video distribution system -- but not to be confused with, say, set-top box functionality, which is a whole different situation which requires set-top box procedure and so forth, right? You wouldn't apply the set-top box procedure to a cable modem because you're streaming content to your iPad, for example.

MR. RIDER: Right. And so just to recap what I think I understood you to say, also is that set-top box just immediately trumps any other -- it's a set-top box. Right? And (indiscernible) has additional functionality and it's really only -- and this is kind of a scoped discussion a little bit, too, but it's really the things that don't have set-top box capabilities that this shipment information, in general, we're discussing today.

MR. HARDY: Right. And I would say that's our position -- this is Gregg Hardy on behalf of the IOUs -- but that discussion is sort of happening real time, I think, between EPA, industry, and others. Certainly, the CEA 2043 test procedure defines boxes that have set-top box capability, and other capabilities as a gateway set-top box.

MR. RIDER: Okay, and that makes me want to kind of institute a rule here: if you mean network equipment

that also has set-top boxes in context of your responses, please make that clear so I can make sure that I'm thinking about the right type of box when I'm hearing your responses. Peter. Well, actually is there anyone else in the room that had any comments on this? Okay, could you go ahead and unmute people? So if you're on the phone, we've unmuted your line. Please, as a courtesy to the folks here, if you're not planning on speaking, please mute your line. With that, anyone who has any comment on U.S. shipment information for Network Equipment, go ahead and speak.

MR. CLINGER: Hi. This is John Clinger. I'm the Technical Lead for the ENERGY STAR Program for small and large network equipment. And I just wanted to confirm that we -- well, I don't know if it was Gregg or Noah summarized it, but essentially any products with set-top box functionality will be covered by the set-top box spec, so they won't be covered by network equipment in the ENERGY STAR program.

MR. RIDER: Thanks for that clarification, John. What did you say your last name was again? Just for our record, I don't know if they could -- okay, great. Any other comments on the phone? Going once, going twice, okay.

Next, I'd like to have a discussion on modes of

1 operation for network equipment. The modes of operation
2 that were identified in the Invitation to Participate were
3 ENERGY STAR's modes of operation, those include various
4 levels of "On" such as idle, load data rate, and high data
5 rate, idle mode being something that is absolutely zero,
6 absolutely nothing is happening. And a discussion around
7 that: are there any missing important modes? So we've got
8 these three modes. Are there any missing important modes
9 to properly characterize power scaling for these products,
10 or just any missing important modes, in general? And is
11 true idle this zero data rate? Is that a valid state?
12 You know, looking at my NIC card, my Network Interface
13 Card, or any other thing, usually there's just some slow
14 maintenance amount of activity that's occurring, so is
15 this absolute zero rate a valid state? And also, is this
16 more representative of a "disconnected," rather than idle
17 state -- like disconnected from the network? ENERGY STAR
18 states are relative to data rate; are there other states
19 that should be considered related to power over Ethernet?
20 So some network equipment will actually power things like
21 telephones, etc.; is that a type of state that we should
22 consider for network equipment? Is there, you know, an
23 "I'm powering other devices" state versus "I'm not
24 powering any other devices" state, for example? With
25 that, I'm going to open the discussion first to folks in

the room. Anyone with any comments on Modes of Operation? No? Okay, Peter, if you could unmute the lines? The lines are unmuted. If you're on the phone there, please feel free to speak. Hearing no comments -- oh, go ahead, Gregg.

MR. HARDY: Hi. Gregg Hardy on behalf of the California IOUs. And John Clinger, who is online, can correct me if I'm wrong, but the states -- the modes as defined by the ENERGY STAR spec are sort of an artifact of how network equipment is tested, and I don't think that most network equipment spends a lot of time in idle state as defined here with zero network traffic, unless it's a WiFi router and there's no WiFi device connected to it. And really, the only value that's relevant to whether or not you qualify for ENERGY STAR is this slow data rate because devices spend most of their time in a low data rate mode, and of course ENERGY STAR has defined that as 1 kilobit per second for the sake of having a repeatable test. But if you were to define these things in terms of user terms, low data rate means sort of, you know, the term in Europe is Network Standby, which means it's on the network, it's trading packets, keeping track of its network status, and so forth, so there is some data rate, it's not exactly 1 kilobit per second. And that's really the relevant mode. Even when network equipment is being

1 used to, say, stream a video stream, in most cases that's
2 actually a very small fraction of the total bandwidth of
3 the device, so full data rate is another important mode,
4 or high data rate as ENERGY STAR terms it, but the devices
5 spend very little time in that mode. Maybe when you're
6 doing a file transfer, peer to peer file transfer within
7 your home network, you could approximate high data rate.
8 So the really important thing with network equipment is
9 that it reduces the energy consumption in low data rate
10 because it spends a vast majority of its time at low data
11 rate, and that's how the ENERGY STAR spec is set up, and
12 that's how I would think what we would want to focus on in
13 this context, as well.
14 MR. RIDER: And you're speaking mainly to
15 residential network equipment, correct?
16 MR. HARDY: Yes.
17 MR. RIDER: And I think that was another
18 important differentiation. I think a lot of the
19 information received was very focused, so just to provide
20 context, a lot of these numbers and figures that I think
21 we've talked about, and will continue to talk about, these
22 were residential focused information and not commercial
23 network equipment figures.
24 MR. HARDY: Right, right. My comments are
25 targeted towards sort of the scope of the ENERGY STAR

scope --

MR. RIDER: Right.

MR. HARDY: -- which in the latest release, by the way, which came out last week, has been revised to exclude enterprise class small network equipment, which the distinction used to be 11 ports or fewer, and now they're making distinctions that would exclude devices that you would not recognize in a home. These are very much, you know, business targeted devices that have these SFP ports and other technologies that you would not find in a home setting. But these devices that we're calling residential devices, that you would find in Best Buy that we would all recognize as network equipment, often get used for small business, as well, as residential. So it's sort of small network equipment -- you could almost call it dual purpose in some ways, right? Targeted maybe at residential, but it gets a lot of use in small commercial applications.

MR. RIDER: Yeah, I think we saw that with televisions, as well.

MR. HARDY: Okay.

MR. RIDER: So I understand what you're -- I at least understand what you're saying. I think we got a comment in chat. "What about energy efficiency Ethernet capabilities at idle state?" I'm not sure I understand

1 the point --

2 MR. HARDY: Let me try to speak to that.

3 MR. RIDER: Okay.

4 MR. HARDY: The whole point of Energy Efficient
5 Ethernet, or EEE is the acronym there, is that it reduces
6 the power for network equipment when it's not running at
7 full bandwidth, so that the old story with the network
8 equipment is that it runs at the same power level all the
9 time, whether or not you run a lot of data through it, or
10 you're not running a lot of data through it. And the
11 early EEE compliant products are scaling power so that,
12 when a port is not running at high bandwidth, that it can
13 use significantly less power. And my understanding is
14 that in the future they'll go much further than that, so
15 that not only do you save power at the port level when
16 you're not running at full bandwidth, you save system
17 level power, too. And what it's doing is that, when
18 devices run at low data rate, they're actually -- they
19 send a packet which takes a microsecond, and then they've
20 got sort of millisecond periods where the device isn't
21 doing anything, even in what you might think of as sort of
22 higher data rate, like a single video stream actually is
23 not coming close to fully utilizing the capability of a
24 gigabit bandwidth router, right? So there are actually
25 long periods. And the thought is to put the whole device

in some sort of sleep state in between those packets, and that's what energy efficient Ethernet is about, and there are some technologies being developed that I think are less mature and there are not, I don't think, industry-wide standards for power scaling for WiFi, as well.

MR. RIDER: Do you know, are those discrete levels? Is there like, is EEE -- either it's in this power saving mode or not? Or is it something that actually truly scales with the amount of traffic?

MR. HARDY: Well, it's interesting because, at the level that we experience a device, if we were going to actually measure power levels, you would see scaling of the power based on the data rate you run. What's really going on is that there are discrete levels that are very micro level, where when it's in low power idle, it's at a certain level, my understanding, and there might be some fluctuation, but fundamentally there's a low power idle level that stays about the same, and then when the device is transmitting, it's at another higher level. So if you're pulsing the "On" less frequently than you would have in a lower average power. So there are power states, but it's not like TVs where, you know, standby is something you can measure with a power meter as a distinct lower power state. This is a different deal.

MR. RIDER: I understand. All right, were there

any other comments, just because we've talked about the other things, modes of operation?

MR. CLINGER: Sure, hi. This is John Clinger again. Sorry to get cut off previously. Really quick on the Power Over Ethernet, I just wanted to bring up that that is one of the few key things that knocks out Enterprise equipment and the small network equipment specification for ENERGY STAR, and just to note that, if there were any intentions of using, say, the ENERGY STAR test method down the road, because it's out of scope, POE is not there, there is no provision for testing POE. So that's just a note moving forward. If you were to go that route, there would probably have to be additional work done to be able to test it adequately.

MR. RIDER: John, can you elaborate by what you mean when you say EEE knocks out?

MR. CLINGER: POE.

MR. RIDER: Oh, POE, sorry. I misheard you. That makes more sense. Okay.

MR. CLINGER: Yeah. What Gregg mentioned before, basically there's a few things that take equipment out of spec, and one of those is POE.

MR. RIDER: Great. I understand now, I had misheard you. All right, thanks. With that, I think we'll move on to the next topic, which is Duty Cycle.

1 Several estimates of network equipment duty cycles were
2 provided to us in response to the ITP. The IOUs commented
3 that network equipment spends most of its time in network
4 standby, which is, I believe, consistent with what Gregg
5 just said. The CEA 2010 Residential Energy Consumption
6 Report estimates that network equipment is almost always
7 on, which is probably consistent also with this idle
8 state, or this low data state, although it points to a
9 lack of an existing sleep/idle mode in equipment as the
10 reason for that duty cycle, that there was no real power
11 scaling at that time, or very little of it. So the NRDC
12 submitted a network equipment study in their comments and
13 it assumes a 100 percent idle duty cycle.
14 So for discussion, which duty cycle best
15 represents average real world use for network equipment in
16 the market today? And are the duty cycles for modems,
17 routers and gateways different in any way? With that,
18 anybody in the room with any comments on duty cycle for
19 this equipment? Do you want to go ahead and unmute the
20 lines? So we're unmuting the lines. So anyone on the
21 phone that would like to speak, please unmute yourself.
22 Going once, going twice. Noah, go ahead.
23 MR. HOROWITZ: Just very quickly, whether the
24 number is 100 percent, 99 point something, or 98, we don't
25 know the exact number, but it's very close to 100, and to

keep it simple that's what we used, and in this product there isn't a pure "Off" for most of these devices, you can't turn them off, so they're on, sitting there ready or idle, whatever the term is. There are very short spurts where you have a lot of activity, higher energy, then it goes back down. For simplicity, we just assumed 100 percent.

MR. RIDER: Makes sense. Sounds like there's not much disagreement with that approach, either. So I'm going to move on to the next topic, which is the Energy Consumption of Network Equipment.

So the CEA 2010 Residential Energy Consumption Report estimated national energy consumption of network equipment, again, meaning modems, routers and -- what was the other thing -- gateways at 6.4 terawatt hours per year, or 6,400 gigawatt hours per year. The NRDC's network equipment study estimates national energy consumption to be 7.4 terawatt hours per year, so quite a bit larger. And for the NRDC study, I pulled out everything that wasn't a modem, router or gateway.

The primary cause of the differences between these estimated national energy consumptions were a difference in the estimated amount of unit energy consumption. There seems to be relatively little change in power and energy consumption in these devices over time

1 -- that is for discussion -- is energy consumption in
2 network equipment increasing, decreasing, or remaining
3 relatively the same, or flat? And with that, I'll open it
4 up to folks in the room. Noah.
5 MR. HOROWITZ: In response to your question at
6 the bottom here, there are two trends, one is more and
7 more products will have Energy Efficient Ethernet and/or
8 other energy efficiency measures in the box, which should
9 be reducing the energy use of these devices. And our
10 understanding is, when companies move to a new chip set,
11 they build that -- it's essentially software -- into that
12 new chip, and there's little to no incremental cost to
13 achieve that, which is good news. On the other side we're
14 seeing a shift towards higher data transfer rates, gigabit
15 per second, so we're not sure how those two trends will
16 counteract each other, but those are two things that are
17 occurring.
18 MR. RIDER: And just to follow-up some earlier
19 points, has that increased in bandwidth -- so I thought I
20 heard that, you know, this high bit rate usage is very
21 rare and so what's driving -- I guess if it's not really
22 used, then what would be the drive to increase the speed?
23 MR. HARDY: Sure.
24 MR. RIDER: Go ahead, Gregg.
25 MR. HARDY: Certainly in a commercial setting, it

is used, so the silicon is out there, and if the silicon is out there and cost-effective, then why not put it in a residential unit? I think that has something to do with it.

MR. RIDER: Okay.

MR. HARDY: And then that story is true for routers, but for cable modems and DSL modems, more bandwidth is welcomed, so that the Telcos who have not offered fiber to the home are trying to keep up with the fast data rate that cable is providing, and so they're moving to higher power technologies like VDSL from ADSL, and so that uses incremental energy. So it's not true across the entire spectrum of product classes that there's excess throughput across all of these. And then on the wireless front, there's I think enough data rate to satisfy most needs, but if you want full home coverage and the ability to stream multiple video streams throughout your entire house, then you can get into higher power solutions like there's a multiple antennae solution called MIMO, which requires that you power multiple antennas all at the same time, so that uses incremental energy, but you get incremental utility for that incremental energy.

MR. RIDER: Thanks.

MR. HOROWITZ: And, Ken, to your question, it's still too early to know if MIMO can be done with power

scaling, so if you're not transmitting information, can those antennas ramp down in that power consumption.

MR. RIDER: Thank you. Good to know, and I think that really speaks to this topic. Any other comments? Did we already open up the line for this? If you could, then? All right, the lines are unmuted. So if you have any comments and you're on the line, feel free to speak.

MR. CLINGER: Just a note on the MIMO configuration -- this is John Clinger again -- in the ENERGY STAR dataset, by far the biggest increase in power that we've seen is the WiFi products with simultaneous dual band. A MIMO configuration's additional channels, especially received channels -- chains -- that's where we're seeing significant increases in energy consumption. We've actually developed hatters (ph) for it because it's that large.

MR. RIDER: Thanks, John. That's useful information. All right, anyone else on the line? Okay, we'll move on to the next subject, which is the Lifetime of Network Equipment.

So the only information, at least that I could find in the responses, were the IOUs and NRDC provided an estimate of product lifetime for network equipment and they estimated it at five years. So the questions I have is, is the lifetime of network equipment substantially

1 different than a set-top box? And I think that's getting
2 at some of the overlap issues that we kind of talked about
3 earlier. You know, set-top boxes had a longer lifetime,
4 and so for network equipment that's integrated into set-
5 top boxes, would that then have a longer life? And also,
6 does five years seem like a reasonable lifetime for
7 network equipment? And obviously, the IOUs and NRDC have
8 proposed it, but for other folks and other interested
9 stakeholders, we would be interested to hear if they
10 concur or feel like it should be a different number. So
11 I'm going to open it to folks in the room first. Any
12 comments on the lifetime of network equipment? Doug, were
13 you -- oh, okay. All right, not seeing anyone, can you
14 open the lines? The lines have been unmuted if you have a
15 comment on the phone, go ahead. Going once, going twice.
16 Okay, so Gregg, you had something to say?
17 MR. HARDY: Sure. Gregg Hardy on behalf of the
18 California IOUs. I have to think that the lifetime is
19 different between, say, cable modems and WiFi routers
20 because WiFi technology is moving along so quickly, but
21 there aren't a lot of good sources of data out there about
22 lifetime, so we welcome any input on lifetime, especially
23 between the different product classes that are considered
24 network equipment.
25 MR. RIDER: Anecdotally, I've had the same modem

for nine years, I think.

MR. HARDY: At some point in time, your service provider will no longer -- it will no longer be a qualified modem and I'll stop --

MR. RIDER: Right, but so far so good.

MR. HARDY: Right, right.

MR. RIDER: But that's just completely anecdotally. Thanks. I guess I'll move on to the next topic, which is Incremental Cost of Improved Efficiency in Network Equipment.

So several energy efficiency opportunities were identified in the ITP responses, some of them we've already mentioned earlier today, improved components, you know, better chips, better just internal pieces and parts, Energy Efficient Ethernet, and automatic power save delivery mode (APSD), which I think that's an energy saving opportunity for wireless networks.

The NRDC estimated in the study provided in its comments a zero dollar incremental cost between what was an energy efficient, or more efficient 4.6 watt router and a less efficient 7.9 watt router with similar functionalities set. And that's zero dollars -- well, I guess it doesn't matter where, but at retail, I think, is where it is identified in its study. So in the discussion, do retail prices of network equipment

correlate with energy consumption for same-featured products? So essentially, if you were to draw a line of the performance in terms of energy consumption, would you get a good correlation? Could you draw -- would there be a good relationship with the cost, meaning does improved efficiency tend to cost more in the market today, or less? Or is it hidden amongst other features and brand names? Does this incremental cost seem reasonable? And by this, I mean the NRDC incremental cost. If not, what should the cost be for this improvement in the energy efficiency? And with that, I'm going to open it for comments in the room -- on this incremental cost, or any incremental costs. Any comments? Okay, I'm going to open the line. The lines are unmuted; if you're on the phone, feel free to speak. Okay, well, I don't hear any comments on the line. I'm going to move on to the next topic, then, which is General Comments.

So anything we didn't cover today that you would care to comment in relation to this Invitation to Participate for Small Network Equipment, or just Network Equipment, in general, actually, feel free to make those comments now. I'll open it up to folks in the room. Any general comments? Doug?

MR. JOHNSON: Doug Johnson, CEA. Ken, I guess it's more of a question that I have. In the Commission's

2012 Order Instituting Rulemaking Proceeding, which identified the specific product categories that the CEC was going to take a look at, networking equipment, or network equipment, was not one of those categories as part of that document, or part of that permission. So maybe you could clarify how it's become a part of this proceeding when it wasn't identified in the OIR from 2012.

MR. RIDER: Okay, well, I think one of the reasons that happened was because of the overlap, you know, looking in this field there's more and more overlap between set-top boxes, specifically, and network equipment; but there's a difference, I mean, what they do is a little bit different. So, one reason is to split it out. The second reason is we did so -- the OIR was developed out of a 2011 scoping workshop which did identify some opportunities for small network equipment. You're correct, in the OIR it doesn't name network equipment, but there was a desire to gather information and actually include it in this process, so that's basically the history.

MR. JOHNSON: I understand the desire, I think it may be a procedural issue, as well.

MR. RIDER: Okay. Noted. Any other comments? Go ahead, Gregg.

MR. HARDY: Sure. So from my perspective, the

1 big picture story with network equipment is that ENERGY
2 STAR has developed a test procedure and draft
3 specification for network equipment. We see, when we look
4 through the dataset that ENERGY STAR has, and the data
5 that NRDC collected, there's significant variation of
6 power levels between devices that do the same things, and
7 we see an opportunity there. And there are technologies
8 like Energy Efficient Ethernet coming down the pike which,
9 anecdotally, we hear will not add incremental cost to
10 silicon because it will basically be baked into all
11 silicon, it doesn't require a lot of processing power, it
12 doesn't drive silicon real estate. So we've got that to
13 look forward to in terms of, you know, we expect this to
14 be a moving industry where these products do reduce energy
15 consumption, but right now, even without that technology,
16 we see wide variation in power levels and devices. So the
17 idea behind regulation is just to ensure that the least
18 efficient of those devices within that range are
19 eliminated from the market, so we see that clear
20 opportunity.
21 MR. RIDER: Right, and I think that speaks to the
22 interest I was alluding to, just that there were some
23 opportunities that we became aware of and decided to
24 investigate them essentially through the ITP process. Any
25 other comments? Peter, can you unmute the line? All

1 right, the phone line has been unmuted if you would like
2 to speak to General Comments, go ahead. All right,
3 hearing none, I'm going to go ahead and move on.
4 So Next Steps. So this ends the ITP process for
5 Network Equipment. We're moving into the Request for
6 Proposal phase. As I mentioned, all the topics that we
7 requested information for are going to move into that
8 phase.
9 The Request for Proposal Comment Period will be
10 from June 10th to July 25th. The Energy Commission will
11 be issuing a proposal template as guidance to stakeholders
12 to make meaningful proposals, proposals that we can
13 properly evaluate. And I would like to emphasize that
14 Commission staff are available to discuss questions and
15 concerns at any time during the proceeding, whether it's
16 in this proposal phase, regarding this ITP phase that
17 we've just finished, or going forward into any of the
18 future phases.
19 Just as a graphical representation, you may have
20 seen this before, certainly it's been up several times
21 today, we have moved from the Invitation to Participate
22 phase and are now moving into the Request for Proposal
23 phase.
24 And that concludes my presentation. This is my
25 contact information if you have any questions on Network

Equipment. Thank you. Oh, also, I would also like to take the opportunity -- this was the last presentation of the day, I'd like to thank everybody for taking the time to come out here and a lot of you provided written comment, which thank you very much for that, but it's really going above and beyond and we're very thankful for you to have traveled here and provided even further information into the record so that we can make proper policy and decisions for all of these subjects, not just network equipment, of course, you know, all of the products we've talked about today. So thank you very much, and have a safe trip home if you're traveling today. Oh, and also all these presentations are available online if you haven't seen them, they're available.

(Thereupon, the Workshop was adjourned at 5:00 p.m.)

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