UNITED STATES OF AMERICA

DEPARTMENT OF ENERGY

**PUBLIC MEETING ON ENERGY CONSERVATION PROGRAM: SUPPLEMENTAL NOTICE OF PROPOSED RULEMAKING ENERGY CONSERVATION STANDARDS FOR STANDBY MODE AND OFF MODE FOR MICROWAVE OVENS**

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

2 MR. BROOKMAN: Let's get started. Good
3 morning everyone and welcome. This is the U.S.
4 Department of Energy's public meeting on energy
5 conservation standards for standby mode and off-mode
6 for microwave ovens. Today is Wednesday, March
7 14th, here in the Forrestal Building, 2012, in
8 Washington, D.C. This is the supplemental Notice of
9 Proposed Rulemaking. Glad you could be with us here
10 this morning.

11 My name's Doug Brookman from Public
12 Solutions in Baltimore. We're going to start off
13 this morning with welcoming remarks from Wes
14 Anderson of the Department of Energy.

15 **Welcoming Remarks**

16 MR. ANDERSON: Hello everyone. My name's
17 Wes Anderson, as Doug said. I'd like to welcome you
18 today to the Department of Energy's discussion on
19 the SNOPR Supplemental Notice of Proposed Rule,
20 where the Department is going to discuss its
21 proposal to amending the energy conservation
22 standards for microwave ovens standby and off-mode.

23 Basically, a microwave oven, as everybody
24 knows, is an appliance that consists of a

1 compartment that heats or cooks food or liquids by
2 microwave energy – primarily through microwave
3 energy. And the average single microwave consumes
4 about 166 kilowatt-hours per year. Nationally, that
5 equates to primary energy accounting of about one-
6 third of one percent of residential energy use,
7 which is – equates to another total of .06 percent
8 of the total U.S. energy, of which 15 percent of
9 that is standby and off mode.
10 Today we're going to talk about how DOE
11 came up with its TSL or trial standard levels that
12 will affect that energy use. First we'll start off
13 with Judy – Judith Reich who will discuss the
14 engineering and go through the history of what has
15 gone on with this rule, it's been a storied history,
16 and talk about the environmental, industry impacts
17 that made some changes where we had to repeal the
18 active mode test procedure and put out an interim
19 test procedure. And then we also – she'll discuss
20 the market and technical assessments, screening
21 analysis, engineering analysis.
22 Greg Rosenquist will do the LCC and pay
23 back analysis discussion, using the shipment
24 analysis, national energy savings, utility
25 employment, and impact analysis and environmental

1 assessments. Then follow – that followed by Ben
2 Barrington who will go into further detail about the
3 manufacturing impacts and discuss the TSLs.
4 And throughout this process, this is an –
5 I'd like to make it known that this is an
6 interactive - iterative and interactive process
7 where you're asked today, the major component, we're
8 going to pose some questions to you and we would
9 request that if you have answers, let us in on it,
10 or provide them by the end of the comment period.
11 And towards the end of the presentation, we'll talk
12 about how to submit comments, where they need to go
13 and answer any questions that you have. I don't
14 have anything else to say, so Doug, take it away.
15 MR. BROOKMAN: Thank you. It's our
16 tradition to start with the introductions. You can
17 get used to turning these microphones on and off and
18 illuminating the little green button. We'll start
19 over here to my left. Please say your name and
20 organizational affiliation.
21 **Introductions**
22 MR. SHARP: Mark Sharp representing
23 Panasonic.
24 MR. BROOKMAN: Thank you.
25 MR. CHRISTIANSEN: Good morning. My name

1 is Adam Christiansen with the Appliance Standards
2 Awareness Project.
3 MS. WALTNER: Meg Waltner with the Natural
4 Resources Defense Council.
5 MS. CLEARY: Jen Cleary with the
6 Association of Home Appliance Manufacturers.
7 MR. LEYBOURN: Steve Leybourn also from
8 the Association of Home Appliance Manufacturers.
9 MR. BATTAGLIA: James Battaglia, Navigant
10 Consulting.
11 MR. BARRINGTON: Ben Barrington, Navigant
12 Consulting.
13 MR. ALTMAN: Ari Altman, Department of
14 Energy, General Counsel's office.
15 MR. BROOKMAN: Wes has already introduced
16 himself. Please stand up.
17 MR. WATSON: Troy Watson, Navigant
18 Consulting.
19 MS. REICH: Judith Reich, Navigant
20 Consulting.
21 MR. ROSENQUIST: Greg Rosenquist, Lawrence
22 Berkeley National Laboratories.
23 MR. LONG: Tim Long, LBNL.
24 MS. WHITEHEAD: Camilla Dunham- Whitehead,
25 LBNL.

1 MR. BROOKMAN: Thank you all for being
2 here and allowing us to get an early start on this
3 meeting today. We should also welcome those that
4 are joining us via the web. Do we have folks
5 joining us being the web?
6 PARTICIPANT: Yes, we have four.
7 MR. BROOKMAN: Great. The Department of
8 Energy is trying to make these meetings accessible
9 to folks that can only come via the web, so welcome.
10 Glad you're here.
11 Wes already did an agenda review.
12 **Agenda Review**
13 MR. BROOKMAN: All of you received a
14 packet of information as you came into the room
15 today. In that packet, there's both the agenda and
16 the PowerPoint slides which I'll be referring to and
17 will be the reference point for discussion today and
18 also the Federal Register notice.
19 I would ask for your consideration. I'm
20 going to run through what we expect are the ground
21 rules for today, but immediately following this,
22 there's an opportunity for anybody that wishes to do
23 so, to make opening statements, raise issues that
24 are important to you. Please speak one at a time.
25 Please say your name for the record. There will be

1 a complete transcript of this meeting available to
2 you and to the Department. I'm going to be cueing
3 individuals by name as best I can. I also wish to
4 encourage follow-on comment. I find that's
5 sometimes very useful to the Department to have that
6 back and forth on the record. If you can keep the
7 focus here. Please turn your phones on silent mode.
8 Try to be concise today, share the air time.
9 As you look at the agenda, you'll note
10 that the Department anticipates we'll probably
11 finish this in a half a day or so, so we'll probably
12 work – we'll take a break mid-morning, but try and
13 get this done before the afternoon reaches in here.
14 Okay? So that's the general plan.
15 Questions and comments on the agenda?
16 Okay, so let's have opening statements, remarks,
17 things that matter to you and your constituents.
18 Jen, nothing? No? No one else has opening remarks
19 here? Okay. Then let's go straight into the
20 meeting content. Wes.
21 MR. ANDERSON: Hi, Wes Anderson with DOE.
22 I'd like to let you know that the transcript will be
23 available on the web in – I want to say about a week
24 after. It'll take some editing and review on our
25 part, so it will be up on the web for your reading

1 pleasure or downloading pleasure.

2 Also we found that we needed to make a

3 change on some slides. The slides between 32 and

4 43, which you guys will remind everybody to go to

5 the insert for that. And if there are no questions,

6 Judy, you can go ahead and get started.

7 MR. BROOKMAN: And Wes is referring to -

8 there are two segments, there's a supplement that's

9 a separate stapled copy there. Okay. So now then,

10 to Judith Reich.

11 **Regulatory History**

12 MS. REICH: Good morning everybody. I'm

13 Judith Reich from Navigant Consulting. And I'm

14 going to jump ahead to slide four or so, because Wes

15 has already introduced the purpose of this meeting,

16 and just to let you know at various points in the

17 presentation we will have opportunities for comment

18 that are indicated as such with one of these blue

19 boxes. However, please feel free to comment at any

20 point.

21 So the first thing that I'm going to talk

22 about is how we got to where we are today, to show

23 you the history of this rulemaking. And it started

24 out in 2006 with the Notice of Availability of the

25 Framework Document in which DOE presented its

1 thoughts on proceeding with an analysis for a number
2 of different products. This rulemaking was
3 originally bundled together with quite a few other
4 products: dishwashers, dehumidifiers, all cooking
5 products, and commercial clothes washers.
6 The preliminary analysis was presented in
7 the Advanced Notice of Proposed Rulemaking, and at
8 that point the analysis was based on the existing
9 efficiency metric for microwave ovens, which was an
10 energy factor. However, stakeholders commented in
11 response to the ANOPR that power was of particular
12 interest for microwave ovens, and therefore, when
13 the NOPR was issued in 2008, separate analyses were
14 provided for the active mode, that cooking
15 efficiency portion of microwave ovens, and a
16 separate standby power analysis.
17 I'll talk in a little bit more detail
18 about this, but stakeholders in response to the NOPR
19 indicated that there were reasons that the microwave
20 ovens standby power portion should be continued.
21 Therefore, the rulemaking went to a final rule for
22 microwave ovens just for the active cooking
23 efficiency. And as it turned out, in that 2009
24 final rule, DOE determined that no standards were
25 justified, so it maintained a no-standard standard

1 for microwave oven cooking efficiency.

2 I also want to point out that in parallel

3 with this rulemaking, there has been a test

4 procedure rulemaking to incorporate measures of

5 standby and off-mode power into the cooking products

6 test procedure. They were not available for

7 microwave ovens prior to this, so at the NOPR stage

8 for the standards rulemaking, a NOPR for a new test

9 procedure was published.

10 So the purpose of the NOPR was to

11 specifically analyze standby power separately from

12 cooking efficiency. The NOPR also proposed a one

13 (1) watt standard for microwave ovens. In response

14 -- and this is based on the proposed methodology in

15 the test procedure to use the existing international

16 method for measuring standby power, the

17 International Electro technical Commission's IEC

18 62301. The proposed test procedure at that time was

19 based on the current version, which was edition one.

20 But in response to the standards NOPR, DOE received

21 comments from stakeholders that they were aware that

22 the IEC was updating 62301 and that the second

23 version was expected shortly.

24 So the decision was made by DOE to

25 continue the microwave oven standby power rulemaking

1 – energy conservation standards rulemaking, rather
2 than going to a final rule so that DOE could
3 consider the second edition of IEC 62301. And the
4 reasons why it chose to do that was that EPCA has a
5 – EPCA, the Energy Policy Conservation Act –
6 contains a statutory requirement that DOE must
7 consider the most current version of 62301. And
8 then secondly, because manufacturers of microwave
9 ovens sell their products into many markets. The
10 majority of microwave ovens here are imported.
11 There was a desire to have international
12 harmonization. So, once the second edition would
13 come out, many other markets would be requiring the
14 use of that, so in the interest of harmonization,
15 DOE decided that it would consider that second
16 edition also.
17 So while that was the primary focus for
18 going to a supplemental NOPR, there are some other
19 topics that are addressed for comments that were
20 received in response to the NOPR, and what we'll
21 present today are the updates and the revisions that
22 were made to the NOPR resulting from those comments.
23 The SNOPR was published this past January,
24 January 31st – I'm sorry, issued. It was published
25 on Valentine's Day, February 14th, and today is the

1 public meeting. DOE is very interested in
2 soliciting comments from stakeholders, both at
3 today's meeting and written comments until the
4 comment period closes on April 16th. All of these
5 comments will be reviewed and taken into
6 consideration, and subsequently a final rule will be
7 published in accordance with the statutory
8 requirements.
9 As I mentioned, there's a parallel test
10 procedure rulemaking. An interim final rule was
11 published on March 9th, last year, and this newly
12 included in the cooking products test procedure,
13 measures of standby mode and off-mode energy use.
14 Because at the time that the analysis was conducted
15 for that test procedure, IEC first edition was the
16 official issued version from IEC, the interim final
17 test procedure, interim final rule was based on
18 provisions from that and incorporated by reference
19 certain sections of the first edition. But I should
20 also mention that DOE did consider the draft second
21 edition that was available at that time, and so some
22 of the language from the draft second edition, mode
23 definitions, were also included in that interim
24 final rule.
25 To give you a sense of the timing, the

1 second edition actually published on January 27,
2 2011, so DOE decided to issue the final rule as an
3 interim to allow stakeholders the opportunity to
4 comment on it, provided a 180-day comment period,
5 and in response to comments that were received, DOE
6 subsequently published a supplemental NOPR for the
7 test procedure in November 2011. And the primary
8 topics that that covered included new proposals to
9 incorporate by reference the second edition of IEC
10 62301 and to address the issue of what constitutes
11 covered products. Comments on that proposal are
12 currently under consideration for the next stage of
13 that rulemaking.
14 Let me just get to the punch line here for
15 today's SNOPR, to give you a chance to comment on
16 them. The SNOPR proposes energy conservation
17 standards for microwave oven standby power only, and
18 for reasons I'll talk about, it's just standby mode,
19 and not off mode. Standby power, prescriptive
20 levels, and I'd like to call your attention to two
21 changes that have been made since the NOPR. The
22 first is that an additional product class has been
23 defined, and the initial product class has been
24 clarified so that the product classes consist of
25 microwave-only ovens and that constitutes all types

1 that just have a microwave oven cavity, including –
2 these would include counter-top and over-the-range
3 units. And product class one also includes
4 countertop combination microwave ovens, where a
5 combination microwave oven consists of a single
6 cavity with microwave capability and convection
7 capability.
8 The second product class is – comprises
9 combination microwave ovens that are both built-in
10 and over-the-range.
11 The proposed standards for product class
12 one reflect the same level that was proposed in the
13 NOPR for just microwave ovens, and that is a one
14 watt maximum standby power level. DOE's
15 additionally proposing a maximum standby power of
16 2.2 watts for product class number two. And as we
17 talk through the analysis, these proposed levels
18 correspond to trial standard level or TSL number
19 three.
20 The compliance date, the date at which
21 manufacturers would be required to meet these levels
22 for any products produced on or after that date,
23 would be three years from the publication of the
24 final rule.
25 At this point, I'd like to invite comments

1 on these newly proposed standards.

2 MR. ANDERSON: This is Wes of DOE. Before

3 you bring up your comments, there was a question

4 brought up from the web. Is the PowerPoint

5 available for download? For those that are out

6 there in cyberspace, you would have to get the

7 PowerPoint presentation from the cooking products

8 web page, and it should be up there this morning.

9 Last night - I loaded it last night, but the system

10 was under maintenance, so they promised to get it up

11 this morning. So if anyone out there can't get it,

12 please give me a call. My phone number is 202-586-

13 7335, and I will try to help you out. I'll e-mail it

14 to you.

15 MR. BROOKMAN: Will they be able to ring

16 in here and now or will that be when you get back to

17 your office?

18 MR. ANDERSON: Oh, after the meeting, I'll

19 be back in my office, or you can leave a message,

20 let me know that there are problems, and I'll try to

21 fix them once the meeting's done.

22 MR. BROOKMAN: Do we have a URL?

23 MR. ANDERSON: I don't have it memorized

24 right now but I'll come up with it in a bit.

25 MR. BROOKMAN: Yeah, let's do that. Let's

1 make it –

2 MR. ANDERSON: It's kind of a long-winded

3 thing, but we can do that, I guess.

4 MR. BROOKMAN: Okay. So comments, please.

5 There's a – Judy did a nice job of explaining the

6 changes that are here. Jen?

7 MS. CLEARY: Jen Cleary from AHAM. I just

8 wanted to comment that AHAM agrees, obviously, with

9 the statutory compliance date of three years from

10 the publication of the final rule, but in the SNOPR

11 itself, there's some kind of confusing dates, I

12 think, assuming that this was going to be published

13 in 2011. So the years are kind of off of that three

14 years, so we just want to note that for, I guess,

15 correction or in our discussion today, if that can

16 be clarified. Thank you.

17 MR. BROOKMAN: Does AHAM have any

18 additional comments on the standard levels that are

19 listed here in slide eight, for example, or the new

20 product class? Anything –

21 MS. CLEARY: We'll provide that in our

22 written comments.

23 MR. BROOKMAN: Okay. Thank you.

24 Additional comments? Judith did a good job of

25 describing several new features here. Let's see if

1 there are any comments on those? Okay. Then we'll
2 proceed.
3 MS. REICH: Well, the next slide was to
4 invite additional comment, but I think we can move
5 on.
6 **Rulemaking Analyses**
7 So this slide presents a map, if you will,
8 of the rulemaking analyses that were conducted.
9 Again, these are revisions to the analysis that was
10 presented in the NOPR. And it gives you a sense of
11 the relationship among each of the pieces of the
12 rulemaking analyses.
13 So I'll start off with the highlit boxes
14 on the left, the first two pieces, which are the
15 market and technology assessment and the screening
16 analysis. I'd also like to point out that again,
17 we're presenting just updates, so for complete
18 details of the analysis I can refer you to the
19 Notice and the TSD, the Technical Support Document.
20 So the first updates were, of course, as I
21 mentioned, in the product classes, and DOE divides
22 covered products into classes based on several
23 criteria. One will be the type of energy used, for
24 example, electricity or gas; capacity or it can
25 include other performance-related features that

1 affect consumer utility and efficiency.

2 The regulatory definition of microwave

3 oven is "A class of kitchen ranges, ovens, which is

4 a household cooking appliance consisting of a

5 compartment designed to cook or heat food by means

6 of microwave energy."

7 So at the time the initial analysis was

8 presented in the NOPR, DOE proposed a single product

9 class which would consist of all microwave ovens,

10 with or without additional thermal elements that are

11 intended for surface browning. It specifically

12 excluded combination microwave ovens, or those with

13 convection systems because at the time DOE was

14 considering active mode energy use as well as

15 standby and DOE stated that it did not have

16 appropriate efficiency information or means to

17 determine the efficiency of a product that had both

18 microwave capability and the convection system. So

19 therefore it was not included in the NOPR.

20 Comments were received that caused DOE to

21 reconsider that position and for today's SNOPR, DOE

22 notes that it, in fact, has determined that

23 combination microwave ovens would be considered

24 covered products because it meets that regulatory

25 definition. It is a product that is capable of

1 heating food or cooking it by means of microwave
2 energy, therefore it would properly fall within that
3 definition.
4 Newly considering combination products,
5 DOE looked into whether there are performance-
6 related features that would justify different
7 product classes and therefore potentially separate
8 energy conservation standards. DOE looked at
9 products that are microwave-only, or those that have
10 the convection capability, the combination units,
11 and also looked at whether the configuration or
12 installation of the product would make a difference.
13 And the three configurations that were evaluated are
14 shown here: a counter-top unit, it's just a stand-
15 alone product, portable product. Built-in units,
16 obviously, are installed in the wall. And the third
17 configuration is over-the-range, where it’s intended
18 to be installed over a cook-top and these products
19 typically contain additional features that allow it
20 to perform properly in that sort of environment, and
21 also provide some consumer utility, and these
22 features would be things like an exhaust fan, or a
23 light for the cook-top.
24 So the first evaluation that DOE performed
25 was to compare configurations for microwave-only

1 units, comparing an over-the-range installation,
2 versus a counter-top unit. And DOE conducted a
3 survey of over-the-range units that are available in
4 the market in the U.S. and determined that key
5 features that relate to standby power are comparable
6 between those in counter-top and those in over-the-
7 range units, specifically display technologies, that
8 the range of available display technologies were the
9 same for both types, so these would include light
10 emitting diode displays, liquid crystal displays,
11 and vacuum fluorescent displays. So that entire
12 suite of display types were available for both.
13 The other portion of the analysis that DOE
14 performed was to do some limited testing, in-store
15 testing, of over-the-range units and the standby
16 power levels that were measured there were similar
17 to those in DOE's much more extensive evaluation and
18 testing of countertop microwave-only units.
19 So therefore, for the SNOPR, DOE is
20 tentatively concluding that there are no features or
21 consumer-related utilities that would warrant a
22 separate product class for over-the-range units
23 versus countertop units, just for microwave-only
24 use. DOE notes that the over-the-range units may
25 have additional components that are energized during

1 active mode operation, for example, those fans or
2 lights, but DOE testing demonstrated that those
3 features do not impact standby power, and therefore,
4 for the purposes of standby power product classes,
5 DOE is putting them all together in product class
6 number one.
7 DOE then looked at, for countertop units,
8 what the potential differentiation could be for
9 products that are microwave-only and products that
10 also incorporate convection systems. For the SNOPR,
11 DOE conducted standby power testing on a
12 representative sample of 13 combination microwave
13 ovens, and for countertop combination ovens, DOE
14 noted that the display technologies were comparable
15 between the two types, between microwave-only and
16 combination, and again, the standby power
17 consumption that was measured was the same typical
18 range as countertop microwave-only units have. So
19 because of this similarity, again, DOE concluded
20 that there were no utility or efficiency-related, in
21 terms of standby power, characteristics that would
22 warrant countertop combination microwave ovens as
23 being a separate class from product class number
24 one.
25 DOE also evaluated built-in and over-the-

1 range combination units, and in this case, the
2 testing that was conducted showed that the standby
3 power was, in fact, uniformly higher than the range
4 of standby powers for either countertop combination
5 units or over-the-range microwave-only units. The
6 range that was measured was 4.1 to 8.8 watts, and
7 DOE, after it performed this testing, performed
8 tear-downs on the products, and determined through
9 this reverse engineering that there are specific
10 additional components that are included in those
11 products that allow the over-the-range combination
12 ovens to handle the thermal loads, and that it's due
13 to this built-in or over-the-range configuration
14 that these features are required, both for the
15 protection from the thermal conditions, and for
16 consumer utility.
17 In particular, there are a significant
18 number of relays, additional relays, that are
19 associated with the control board, and therefore the
20 power supply required also gets larger, and
21 therefore standby power grows. So for that reason,
22 DOE concludes for the SNOPR, that built-in and over-
23 the-range combination microwave ovens do, in fact,
24 warrant a separate product class. Those are defined
25 as product class number two, and that all of the

1 microwave-only units and countertop combination
2 microwave ovens would still properly be included in
3 product class number one.
4 At this point, we seek any comment on
5 utility or performance impacts to built-ins at the
6 standard level proposed by DOE.
7 MR. BROOKMAN: Jen.
8 MS. CLEARY: Jen Cleary, AHAM. Actually,
9 I have just a comment on the product classes
10 themselves. The proposed classes fail to
11 differentiate between countertop and over-the-range
12 microwave-only units because DOE has based the
13 product classes only on standby mode power
14 consumption. And we think this approach is short-
15 sighted because it only is considering standby and
16 not considering active mode, and we recognize there
17 is currently not an active mode test procedure,
18 however should there be one in the future, and I
19 know that’s something that’s being considered, we
20 think that this will, you know, this will not
21 continue on in the future with these product
22 classes. So we’ve previously commented that there
23 are significant differences between the countertop
24 and over-the-range microwave-only units. I know
25 that some of the analysis in this SNOPR disagrees

1 with that, so we will provide some expanded comments
2 in our written comments.
3 MR. BROOKMAN: Okay. Thank you. So there
4 you see the request box, and additional comments?
5 Yes, please. Jen.
6 MS. CLEARY: I have a question as well.
7 Judith, can you just expand a little bit on the
8 testing that was done. I know this is kind of in
9 the TSD, but just wondering which version of IEC was
10 used for all of the testing. I believe it was the
11 first edition, but wanted to get confirmation on
12 that.
13 MS. REICH: Right. It was - there were
14 three different methods that were used. One was the
15 IEC 62301 first edition that requires a five minute
16 measurement period. The second method was,
17 obviously not for in-store testing, but for some of
18 the testing was the 12 hour test, and this was
19 performed for units which have clocks that vary
20 their power consumption as a function of the time
21 that's displayed. Similarly, for those types of
22 units, a ten minute test was performed that was
23 determined to be an equivalent to the 12 hour test.
24 MS. CLEARY: Okay. And is - has there
25 been any thought given if the test procedure adopts

1 the second edition of 62301 to doing any of this
2 testing under that procedure?
3 MS. REICH: Well, the test procedure
4 rulemaking is considering the second edition, and at
5 such point as the test procedure were finalized,
6 then that topic could be considered in the standards
7 rulemaking.
8 MS. CLEARY: Okay. Thank you.
9 MR. BROOKMAN: Additional comments? Okay.
10 I should also note that our webmaster says that she
11 has sent the link to the presentation to all web
12 attendees, so if you haven't - if you aren't able to
13 access the slides, send an email and we'll see if we
14 can get you linked in. Okay. Thanks. Back to
15 Judy.
16 MS. REICH: Okay, the next topic for
17 updates in the SNOPR are the operating modes. The
18 interim final rule for the test procedure provides
19 definitions for standby and off mode based upon
20 draft language in the draft version of the second
21 edition of IEC 62301. And I won't read through the
22 whole definitions, but I do want to point out a few
23 key portions of the definitions. For standby mode,
24 it persists for an indefinite time and it can
25 facilitate activation of other modes, or continuous

1 functions, such as status displays or sensor-based
2 functions, and in particular for microwave ovens, a
3 sensor-based function could include a cooking
4 sensor.
5 Off mode. It also persists for an
6 indefinite time and it's not providing any active or
7 standby mode function. It also should be noted that
8 the definition includes an indicator that only shows
9 the user that the product is in off mode, would keep
10 it in the definition of off mode. That would not
11 put it into standby mode.
12 So, based on that new definition in the
13 amended test procedure, for the energy conservation
14 standards NOPR, DOE considered off mode. In the
15 NOPR, DOE had noted that it was not aware of any
16 microwave ovens in its test sample that had
17 capability of operating in off mode, nor did its
18 research show that there were any products available
19 in the U.S. that were capable of such operation. No
20 information was provided in response to the NOPR
21 that would change that position, but even so, DOE
22 investigated the potential for microwave ovens to
23 incorporate an on/off switch, mechanical on/off
24 switch, that would allow the product to operate in
25 off mode. The conclusion was that because when the

1 switch is off, the product is consuming zero energy,
2 that there is no benefit or no possibility of a
3 standard in off mode because there is no means to
4 further reduce off mode energy use. Therefore in
5 today's SNOPR, DOE only proposes a standby power
6 standard.
7 This is a topic DOE is seeking further
8 information on. Any input and data regarding off
9 mode power consumption for microwave ovens.
10 MR. BROOKMAN: Comments on this proposal?
11 None at this time. Okay.
12 **Technology Options**
13 MS. REICH: The next area in which DOE
14 revisited for the SNOPR were the technology options
15 that were identified for reduction in standby power.
16 At the NOPR stage, DOE had identified a number of
17 components in microwave ovens that impact standby
18 power, and these include:
19 • cooking sensors which are included to allow the
20 product to infer the state of the food load
21 during the process and modify the process
22 accordingly;
23 • various display technologies that are
24 available, as I mentioned, the LED, LCD or VFD

1 displays;

2 • and also the potential feature, which we're

3 calling an auto power shut down, in which there

4 are control boards and logic provided that turn

5 off power to some of the standby power

6 consuming components after a specified period

7 of user inactivity.

8 DOE investigated in its sample of

9 countertop combination microwave ovens and also

10 over-the-range microwave-only units, investigated

11 whether any of these features would be different

12 than for countertop microwave-only units, and the

13 testing showed that, in fact, the standby

14 characteristics were very similar. Further, the

15 same conclusion was drawn for over-the-range

16 combination microwave ovens, not that the standby

17 power was the same, but the same features that were

18 noted for the other types of products were the

19 controlling factor for the determination of how much

20 standby power the product used. So the same suite

21 of technology options were evaluated for both

22 product classes.

23 The first technology option, as I

24 mentioned, are cooking sensors, and DOE, for the

1 NOPR, noted that there are piezoelectric steam
2 sensors available in microwave ovens currently on
3 the market in the U.S. that have zero standby power,
4 as compared to the typical power consumption of an
5 absolute humidity sensor might be something on the
6 order of a watt. And also that other types of
7 sensors, infrared, weight, or relative humidity
8 sensors either have been integrated into products in
9 markets other than the U.S. or have been identified,
10 for example, during manufacturer interviews, as
11 potentially feasible for a microwave application.
12 In response to that discussion in the
13 NOPR, stakeholders commented both that there were
14 concerns about the availability, reliability, and
15 accuracy of these zero standby power sensors, and
16 there was also concern about whether these represent
17 proprietary designs so that there would be
18 intellectual property issues.
19 In response, DOE performed additional
20 research for the SNOPR, and first noted that these
21 alternative sensor technologies, some of them have
22 been available on the market outside of the U.S. for
23 years, and therefore over the potential lifetime of
24 a microwave oven, these sensor technologies have
25 been shown to be applicable. DOE is also not aware

1 of data indicating sensors wouldn't have the same
2 reliability and accuracy that's presently obtained
3 using absolute humidity sensors that are most
4 commonly employed, for example, fouling of the
5 sensor due to humidity in the cavity, but there's no
6 data to indicate that that would be different than
7 for current sensors. DOE also did not discover any
8 intellectual or patent infringement issues for any
9 of the types of zero standby power sensors that it
10 was investigating.
11 The next technology option that it
12 revisited are the display technologies. Again, the
13 three different types of displays, and in particular
14 LCDs, can also have backlighting associated with
15 them. There were concerns raised on the NOPR about
16 the applicability of certain types of display
17 technologies in the environment that microwave ovens
18 are expected to operate in. In particular, concerns
19 about reliability in higher heat installations,
20 particularly in the over-the-range applications;
21 questions raised about whether each of the display
22 technologies provides the same utility of the
23 viewing angle for the consumer and visibility; and
24 third, whether there would be sufficient ability to
25 have various colors, sizes, and complexities of

1 characters for higher end products, where these are
2 potentially installed as a suite of products from a
3 manufacturer, so it's desirable to have a consistent
4 look across the displays of each of the products.
5 Therefore, DOE researched this topic and
6 determined that each one of those types of displays
7 are currently available in more than one over-the-
8 range model, so it appears that they are suitable
9 for that type of environment. But also looking at
10 what the manufacturers of the displays, the
11 information that they provide on them, the
12 temperature ratings for all three are comparable,
13 and that there are displays of all three types that
14 are rated to have the same types of brightness and
15 viewing angle, and ability to show complex
16 characters. So therefore, they are applicable to
17 both the countertop and over-the-range applications.
18 No display was observed to have intermittent
19 backlighting or any other kind of limitation that
20 would reduce consumer utility.
21 Therefore, DOE states in the SNOPR, it
22 continues to believe that all display technologies
23 are suitable for countertop and over-the-range
24 microwave ovens with no impact on utility.
25 So I'd like to provide an opportunity for

1 parties to comment on the utility provided by
2 specific features that contribute to standby power,
3 in particular, on the utility of display
4 technologies and zero standby power cooking sensors.
5 MR. BROOKMAN: Comments on these features?
6 No comments at this time.
7 MS. REICH: Okay. Let’s move on then to
8 the power supply and control boards. DOE had
9 identified in the NOPR that changing from a
10 conventional linear power supply to a switch mode
11 power supply could improve standby power consumption
12 because switch mode power supplies typically can
13 achieve 75 percent conversion efficiency at the
14 types of power consumption that are required by a
15 microwave oven's control board. And this compares
16 to about a 55-or-so percent conversion efficiency
17 for a traditional linear power supply.
18 But DOE noted in the NOPR that it believed
19 that these types of – that switch mode power
20 supplies had not yet been proven long-term in a
21 microwave oven application. So DOE investigated
22 this further for the SNOPR and the research
23 indicates that switch mode power supplies are
24 currently incorporated into many consumer products
25 and appliances, including some microwave ovens.

1 Other products include computers or battery
2 chargers, and laundry products. So that suggests
3 that the reliability and durability of these power
4 supplies is adequate. DOE does not have any data on
5 the reliability to show that it's any different than
6 a conventional linear power supply again over the
7 typical lifetime of the product.
8 DOE had received comments that there are
9 switch mode power supplies that achieve higher than
10 75 percent efficiency, up to 92 percent efficiency,
11 but those are different consumer applications, that
12 have different power requirements, and DOE's
13 research confirmed that it still is not aware of any
14 switching power supplies that have greater than 75
15 percent efficiency. And again, as I mentioned
16 before, DOE observed that certain combination
17 microwave ovens did include switch mode power
18 supplies when it tore them down.
19 That brings me to the final technology
20 option, the automatic power down, and this is a
21 strategy that allows a manufacturer, by
22 incorporating a function to shut off power to most
23 of the power consuming components during standby
24 mode, and just supply power to the microwave
25 controller with a transformerless power supply

1 during standby. It allows – it reduces standby
2 power significantly, and allows manufacturers to
3 potentially incorporate other features that would be
4 shut off. So it allows design trade-offs.
5 Normally what DOE considered for the NOPR
6 was that this process would happen automatically
7 after a period of inactivity, after the last
8 consumer interaction with the microwave oven. And
9 stakeholders requested DOE also consider the
10 situation of user-activated control to just turn off
11 the display. Under the proposed definitions, mode
12 definitions, when that display is switched off,
13 whether it would go into standby mode or off mode
14 would depend on whether there were any other
15 features that were still energized that would, under
16 that definition, classify it as a standby mode.
17 DOE did not find any products on the
18 market currently that incorporate this type of
19 control, nor does it have any information about how
20 consumers might use it, how often they might make
21 use of the feature.
22 So therefore, for the SNOPR, DOE did not
23 consider – it was unable to evaluate it, but notes
24 that there's nothing about the proposed standard
25 that would preclude a manufacturer to incorporate it

1 - a user-activated control to turn off the display
2 if they so desire.
3 Specific request for comment include
4 requests for input and data on control strategies
5 available that would enable manufacturers to make
6 design trade-offs between incorporating standby
7 power consuming features, such as displays or
8 cooking sensors, and including a function to turn
9 power off to those components during standby mode,
10 essentially the auto-power shutdown option. DOE
11 also seeks comment on the viability and cost of the
12 control board circuitry that could accommodate
13 transistors that would switch off sensors and
14 displays.
15 Okay. Further, DOE solicits information
16 on whether switching or similar power supplies can
17 operate successfully in a microwave oven
18 environment, and the associated efficiency impacts
19 on the standby power.
20 MR. BROOKMAN: So two comment boxes there.
21 Questions or comments?
22 MS. REICH: No? Okay.
23 MR. BROOKMAN: Thank you.
24 MS. REICH: That brings us to the next
25 analysis in the rulemaking, the engineering

1 analysis.

2 MR. BROOKMAN: We're at a point where we

3 should take a short break.

4 MS. REICH: Okay. Okay.

5 MR. BROOKMAN: It's now ten o'clock.

6 We've covered a lot of ground already this morning.

7 Let's take a 15 minute break that means we'll resume

8 at 10:15. Please wear your badge in a visible place

9 as you're walking around the Forrestal building.

10 There are rest rooms at both ends of the hall. The

11 coffee shop is on the ground floor. Please go there

12 directly if you're going to get coffee so you can

13 make it back by 10:15, when we will resume. So, see

14 you back here then.

15 (Whereupon, at 10:00 a.m., the meeting was

16 recessed for a 16 minute period.)

17 MR. BROOKMAN: So we're back. Let's

18 resume. And once again, Judith Reich.

19 **Engineering Analysis**

20 MS. REICH: The stage of the analysis that

21 I'm talking about now is the engineering analysis,

22 and the ultimate goal is to develop curves that

23 capture the relationship between incremental

24 improvements or reductions in standby power and

25 incremental manufacturing cost. DOE performs the

1 engineering analysis by soliciting data from
2 sources, performing its own research, conducting
3 testing, tearing down products, and interviewing
4 manufacturers and other experts.
5 The updates that were made between the
6 NOPR and the SNOPR - well, first I'll talk about the
7 standby power levels that are defined, and these
8 actually are not different levels than were
9 developed for the NOPR. And just a quick run
10 through.
11 • The baseline level corresponds to a product
12 that has all the consumer utility associated
13 with it, for example, cooking sensor and
14 display, and would have the conventional power
15 supply, so the highest typical standby power
16 consumption for such a product in product class
17 one was determined to be four watts.
18 • The next level - this is basically an
19 efficiency level approach.
20 • The next level is defined by the Federal Energy
21 Management Procurement, I think is FEMP,
22 efficiency recommendation, and that is a two
23 watt level.
24 • The third level is the IEA's one watt program,

1 international program targeting one watt of
2 standby power.
3 • And in between standby power level one and
4 three, gap fill was developed or inserted based
5 on products that are available on the market.
6 • And then finally, efficiency level four, it's
7 the max-tech level, that corresponds to standby
8 power that would be associated with automatic
9 power shutdown, and DOE at the time that the
10 NOPR was developed, based that value on a
11 product that was available on the Korean
12 market.
13 Although DOE has included more products, it
14 has now included countertop combination products in
15 this product class one, it still believes that the
16 standby power levels which it's also defining as
17 equivalent to trial standard levels, and the
18 analyses that were used to develop them remain valid
19 for the SNOPR. So these are the same.
20 For product class two, for the SNOPR, this
21 is a new product class and therefore DOE newly
22 developed standby power levels. And to do so it
23 reverse engineered a sample built-in and over-the-
24 range combination units, and analyzed the components

1 within them that contribute to standby power and
2 then determined what the incremental standby power
3 contribution of each of those components is. This
4 was more of a design option approach and was done
5 because, as you can see, the resulting standby power
6 levels are higher, except for the max-tech levels,
7 than the levels that were used in the efficiency
8 level approach for product class one. What these
9 correspond to again, the baseline product has a
10 conventional power supply, cooking sensor, was
11 determined to be 4.5 watts. To move to standby
12 power level one, the cooking sensor, the traditional
13 one, was replaced with a zero standby one, resulting
14 in a .8 watt drop.
15 The next level was obtained by changing
16 the linear power supply to a switch mode power
17 supply, dropped it another watt.
18 Standby power level three is an optimized
19 version of the switch mode power supply and changing
20 from conventional electromechanical relays to solid
21 state relays. That brought it down to 2.2 watts.
22 The max-tech level, again, was assumed to
23 be an automatic power down option. This is a little
24 bit higher than it was for product class one because
25 of the complexity and additional features necessary

1 for a built-in or over-the-range combination unit.
2 The next step was to identify the
3 incremental manufacturing costs associated with each
4 of the standby power levels. Because, as noted
5 previously, DOE believes the same incremental
6 standby power levels and the components and
7 component improvements associated with them remain
8 the same are still valid from the NOPR to the SNOPR,
9 the only change that were made to these incremental
10 costs was to scale them to more recent values. They
11 were scaled to 2010 dollars using the Producer Price
12 Index.
13 For product class number two, DOE used the
14 sample of 13 combination microwave ovens and
15 performed tear-downs on them, developed structured
16 models, bill of materials for them, and analyzed the
17 control board costs in them. It estimated the cost
18 associated with each of the component changes
19 associated with each standby power level. It
20 determined these costs by using quotes from various
21 suppliers to determine what the manufacturing cost
22 at the scale of production that would be expected
23 for them for each design option, and the costs are
24 presented here. They range from $2.29 to - well,
25 the highest is at $9.44 for TSL-3. Again, because

1 manufacturers can make different trade-offs when
2 they use an auto power down option, this analysis
3 estimates a lower incremental cost at max tech than
4 it does at TSL-3.
5 DOE invites any thoughts, any comments on
6 these incremental manufacturing costs, as well as
7 the assumed approaches, I guess, to get to each TSL
8 level, but in particular, TSL-3 for microwave oven
9 standby and off mode, and DOE seeks comment on
10 whether any intellectual property or patent
11 infringement issues are associated with any of the
12 design options associated with those standby power
13 levels.
14 MR. BROOKMAN: We have a question from
15 someone who's joined us via the webinar. This is
16 Nathan Polley, if I'm pronouncing Nathan's – oh,
17 pardon me, it's Nolan Polley from Whirlpool who
18 asks, would the built-in product class include
19 products with multiple cavities?
20 MS. REICH: That is a topic that is being
21 addressed in the test procedure. It is under
22 consideration right now.
23 MR. BROOKMAN: So no answer –
24 MS. REICH: DOE has – yes, DOE has yet to
25 make a determination, but that will be proposed in

1 the next phase of the test procedure.

2 MR. BROOKMAN: So, anyone who has a

3 comment on that issue should send it in in the

4 written comments to DOE. Okay. You can see the

5 comment box, requesting comment on assumed

6 approaches and also intellectual property or patent

7 infringement issues. No comments. Okay.

8 MS. REICH: That is the end of my section.

9 I will turn it over to Greg Rosenquist.

10 **Revisions and Analyses for the SNOPR**

11 MR. ROSENQUIST: Thank you, Judy. Again,

12 my name is Greg Rosenquist. I'm from Lawrence

13 Berkeley National Laboratory, and I'll be going over

14 the revisions that were made for the SNOPR since the

15 last NOPR was issued back in 2008, focusing first on

16 the life-cycle cost and payback period analysis

17 which also includes the markups that determine

18 equipment price, as well as the analysis to

19 determine energy use.

20 MR. BROOKMAN: We should also note that

21 this is where the slides supplement begins.

22 MR. ROSENQUIST: Right. So this slide

23 provides the various inputs to the life-cycle cost

24 and payback period analysis and also shows the

25 comparison between what was done for the NOPR versus

1 what was done for the supplemental NOPR. Starting
2 first with the product costs, that was determined by
3 taking the manufacturing costs, multiplying them by
4 a manufacture markup, multiplying them by a
5 distributor or retailer markup and sales taxes, to
6 come to a consumer retail price. And for the NOPR
7 it was forecast out into the future using constant
8 real prices. For the supplemental NOPR, the same
9 process of marking up manufacturing cost to a
10 consumer retail price was used, but here instead an
11 experience curve was used to forecast that price out
12 into the future, and that was done by correlating
13 the Producer Price Index for electric cooking
14 products to the cumulative shipments for electric
15 cooking products. And that yields a price decline
16 out into the future.
17 Moving on into the inputs that affect
18 operating costs versus the annual energy use, and
19 this is simply calculated by taking the standby
20 power, multiplying it by the hours that the
21 microwave oven is in standby power mode.
22 Variability on that usage on the number of hours in
23 standby mode, DOE used the 2005 Residential Energy
24 Consumption Survey. For the NOPR, the number of
25 standby hours was 71, and that same number and same

1 method was used for the supplemental NOPR.

2 On electricity prices, DOE used for the

3 NOPR, the Energy Information Administration's Form

4 861 data, which provides effectively the average

5 prices for different regions of the country. That

6 same method was used for the supplemental NOPR with

7 the exception that it was updated to the 2009 Form

8 861 data. For electricity price trends, DOE relies

9 on the Annual Energy Outlook to forecast prices out

10 into the future. Again, the same method was used

11 for both the NOPR and the supplemental NOPR, with

12 the exception that DOE updated to the 2010 Annual

13 Energy Outlook for the supplemental NOPR.

14 On repair and maintenance costs, the same

15 assumptions were made for both the NOPR and

16 supplemental NOPR, that is, decreasing standby would

17 not increase repair and maintenance cost for the

18 microwave oven.

19 Moving on to those inputs that help us

20 determine how to get the present value of operating

21 cost savings in the future. First is the product

22 lifetime, and that was determined for the NOPR with

23 a Weibull probability distribution for a narrow

24 range of lifetimes from seven to ten years, the

25 average value was nine years. The same probability

1 distribution was used for the supplemental NOPR.

2 Discount rates. Those are used again to

3 value future operating cost savings and to a present

4 value. DOE looks at how the interest rate

5 associated with consumer debt and equity to purchase

6 microwave ovens as a proxy for discount rates. DOE

7 uses many distributions to come up with this value.

8 The average value is 4.8 percent real. That was the

9 value used for the NOPR. The same data, the same

10 process was used for the supplemental NOPR.

11 And then finally the compliance date of

12 the standard was 2012 for the NOPR and that was

13 moved to 2014 for the supplemental NOPR.

14 MR. ALTMAN: Greg, this is Ari from the

15 General Counsel's office. Those dates that you're

16 referring to, those are just used for your estimates

17 right now, because given the current date, they

18 probably may not be accurate, is that correct?

19 You're actually estimating when the final rule will

20 be published?

21 MR. ROSENQUIST: Right, I'm assuming that

22 for the final rule, we'll be updating that

23 compliance date to 2015, to correspond to three

24 years after the issuance of the final rule.

25 A key input into the life-cycle cost and

1 payback period analysis are what's called the base
2 case and standards case efficiency distributions.
3 They look at how consumers currently buy microwave
4 ovens at the various standby power levels that the
5 Department's considering. And DOE tries to
6 establish the market share of each one of those
7 standby power levels in both the base case, that is
8 the case without standard, and each of these
9 standard cases, in order to make sure that they
10 don't overestimate the benefits that would happen
11 from any particular standby power requirement.
12 To come up with the base case efficiency
13 distribution, again, that's the distribution of
14 efficiencies or standby power levels without any new
15 standards. DOE relied on data, test data, that was
16 conducted by both - a test conducted by both DOE and
17 AHAM on 52 units. Again, looking at that
18 distribution of test data, DOE was able to, as a
19 proxy, come up with the market share of each one of
20 the standby power levels. That same data was used
21 for the supplemental NOPR.
22 Standards case efficiency distributions
23 were generated using a roll-up scenario, a roll-up
24 approach, which will become more clear in the next
25 slide. So this shows the actual base case and

1 standards case efficiency distributions for the
2 product class number one, that's the microwave-only
3 and also countertop combination microwave oven. You
4 can see in this column under base case, that shows
5 you the market share that's been attributed to each
6 one of the standby power levels. So 46 percent of
7 the market was assumed to be at the baseline or four
8 watts at standby; 35 percent at two watts; and 19
9 percent at 1.5 watts, which result in a shipment-
10 weighted standby power consumption of 2.83 watts for
11 the baseline, for the base case, and that
12 corresponds to a shipment-weighted energy use of
13 24.6 kilowatt hours per year.
14 For the roll-up scenario, you can see how
15 that's done by just taking standards case one as an
16 example. You can see there that the 46 percent of
17 the market at the baseline just rolls up to the
18 standard level of interest, in this case, standard
19 level one, which result in 81 percent market share
20 for that particular standard level. The higher
21 standby power levels, their market shares are
22 unaffected, results in a weighted standby power
23 energy - shipment-weighted standby power consumption
24 of 1.9 watts for standard level one, with a
25 corresponding annual energy use of 16.5 kilowatt

1 hours per year. And that same process is used for
2 these various other standards cases.
3 This slide shows the exact same process,
4 base case and standards case efficiency
5 distributions for product class two. Here DOE
6 didn't have any data, so they just assumed that 100
7 percent of the market was at the baseline level.
8 And so when you apply the rollup approach, that just
9 moves that 100 percent of the market to the
10 standards level that is under consideration.
11 Which brings us to the first and only
12 issue that DOE is seeking comment on for the life-
13 cycle cost and payback period analysis, and that's
14 on these efficiency distributions, and in
15 particular, the market share in the base case for
16 product class one, the market share at one watt, and
17 the market share at 2.2 watts for the product class
18 two. These again are the proposed standards that
19 DOE has issued.
20 MR. BROOKMAN: Comments on these? Okay.
21 **National Impact and Shipment Analyses**
22 MR. ROSENQUIST: Okay. I'll move on now
23 to the next analyses which are the national impact
24 and shipments analysis. Again, any revisions made
25 to the national impact analysis will affect all

1 these downstream analyses including the manufacturer
2 impact analysis, the utility, environmental impact
3 analysis, the employment impact analysis, and the
4 regulatory impact analysis.
5 I'm going to walk you through now these
6 various inputs that went into the shipments
7 analysis, and whether or not there were any changes
8 from the NOPR to the supplemental NOPR. For the
9 number of product classes, we've heard DOE only
10 analyzed one class for the NOPR, two classes for the
11 supplemental NOPR. The key thing here is that 99
12 percent of the market is captured by product class
13 one, while only one percent by product class two.
14 Shipments to new construction. The same
15 method is used for both the NOPR and the
16 supplemental NOPR, that's taking housing forecasts
17 and multiplying them by the saturation of microwave
18 ovens in new housing. DOE used a 95 percent
19 saturation value, and that was based upon a
20 combination of AHAM data and data from the
21 Residential Energy Consumption Survey. The only
22 update for the supplemental NOPR was to use a more
23 recent housing forecast, that from the AEO 2010.
24 Shipments to the replacement market were
25 done in the same way. DOE established a retirement

1 function based upon that lifetime distribution that
2 I discussed earlier for the life-cycle cost analysis
3 and just used that retirement function to figure out
4 when microwave ovens in the housing stock would fail
5 and would need to be replaced.
6 Going on with additional shipments
7 analysis inputs. There are the historical
8 shipments, data sources for the NOPR were both from
9 AHAM and from Appliance Magazine. The same data was
10 used for the supplemental NOPR with the exception
11 that a few more years of data from Appliance
12 Magazine were added because of the additional time
13 we had to do the updated analysis.
14 To calculate the impact of lowering the
15 standby power level on standards case shipments, DOE
16 developed what's called a relative price elasticity,
17 and this takes into account the increased purchase
18 price, the operating cost savings, and household
19 income. The most dominant effect, though, is the
20 increase in purchase price. DOE looked at price
21 efficiency data for refrigerators, clothes washers,
22 and dishwashers to develop this price elasticity,
23 and assumed it just applied to microwave ovens as
24 well. That value turned out to be minus point three
25 four (-.34) which means that for a ten percent

1 increase in the relative price, or really, the
2 purchase price, there would be a corresponding
3 decrease of 3.4 percent in the product shipments.
4 And this same process was used for the supplemental
5 NOPR.
6 Fuel switching was not considered at all,
7 that means that DOE did not consider that microwave
8 oven consumers would switch over to a different type
9 of electric cooking product or gas cooking product.
10 Moving on now to inputs that are used for
11 the national impact analysis. I've already gone
12 over the base case and standards case forecast
13 efficiencies. One point I wanted -- back in the LCC
14 analysis - one point I wanted to make here is that
15 DOE assumed a frozen efficiency trend for both the
16 base case and standards case, meaning that whatever
17 it assumed as a shipment-weighted standby power
18 level at the compliance date, it was held constant
19 over the forecast period.
20 The annual energy consumption per unit,
21 the total installed cost per unit, which is also the
22 retail price of the microwave oven, and the energy
23 cost per unit are all a function of the shipment-
24 weighted standby power level for any given year.
25 And that process of determining those three inputs

1 was done in the same way for both the NOPR and the
2 supplemental NOPR. There is one important change
3 that for the purchase price of the equipment, the
4 experience curve was used to forecast prices out
5 into the future.
6 And then moving on, the repair and
7 maintenance cost per unit, as discussed earlier in
8 the life-cycle cost analysis, DOE assumed that there
9 would be no increase in repair and maintenance costs
10 due to lowering the standby power level. There's no
11 change from the NOPR and supplemental NOPR on that
12 particular input.
13 The energy price forecast, as I discussed
14 earlier in the life-cycle cost analysis, are done in
15 the same way with the forecast from the annual
16 energy outlook.
17 Site-to-source conversion factors are used
18 to convert the site electricity for a microwave oven
19 to its source energy consumption, taking into
20 account the efficiency of the power plant and
21 transmission and distribution losses. DOE uses the
22 national energy modeling system, or NEMS, to come up
23 with these factors, and although it says no change
24 there, the method had no change, but DOE used the
25 most recent version of NEMS to come up with those

1 conversion factors for the supplemental NOPR.

2 For discount rates, these are used to

3 convert future economic impacts to a present value,

4 and these are dictated by the Office of Management

5 and Budget. They're done at discount rates of three

6 and seven percent real. And then the present year

7 that was used for this discounting for the NOPR was

8 2007, and for the supplemental NOPR was 2011.

9 And finally, we're moving on to the last

10 slide which I'm going to present which is the trial

11 standard levels. This just shows you what the trial

12 standard levels are for each of the product classes.

13 There's four trial standard levels per product class

14 which equate to the number of standby power levels

15 that were considered in both the engineering and

16 life-cycle cost analysis.

17 So that's the end of my presentation.

18 I'll take any questions.

19 MR. BROOKMAN: Or anything specifically

20 you would like to see if they would address?

21 MR. ROSENQUIST: Only, you know, whether

22 we got the market shares correctly for the base case

23 efficiency distribution, but other than that,

24 nothing in particular.

25 MR. BROOKMAN: Comments now on these

1 materials? Okay.

2 MR. ROSENQUIST: Okay. Then I'll hand it

3 over to Ben Barrington from Navigant to talk about

4 the manufacturing impact analysis. And for this

5 we're going back to the original packet, the

6 original PowerPoint packet.

7 **Manufacturing Impact Analysis**

8 MR. BARRINGTON: Thanks very much, Greg.

9 I'm Ben Barrington with Navigant Consulting and I'm

10 going to take you through some of the adjustments

11 that we made to the manufacturing impact analysis

12 as part of this SNOPR.

13 So the manufacturing impact analysis is a

14 downstream analysis so the majority of the updates

15 that we made are as a result of changes to other

16 analyses, so primarily the engineering and shipments

17 analysis as described earlier. With the adjustments

18 to the engineering analyses, the MIA now makes use

19 of new MPCs [Manufacturer Production Costs] for both

20 product classes, and all of those costs were

21 converted to 2010 dollars using the PPI [Producer

22 Price Index].

23 Additionally, we updated the shipments and

24 efficiency distributions for both product classes as

25 well, and incorporated new price trends into the

1 analysis as Greg described previously, through the
2 experience curve.
3 Additionally, we also updated the
4 conversion costs required by manufacturers to
5 produce compliant products. These are the capital
6 conversion costs which are upgrades to existing
7 manufacturing facilities and capital equipment to
8 bring products into compliance, as well as the
9 research and development and marketing budgets,
10 which are considered the product conversion costs.
11 These were segmented across both product classes
12 based on the previously mentioned split as described
13 by him, 99 percent to product class one, one percent
14 to product class two. Additionally, we used that
15 same split for these product conversion costs and
16 converted them to 2010 dollars using the PPI as
17 well.
18 And so the result of incorporating those
19 changes into our analysis, the impacts on INPV,
20 which is the Industry Net Present Value for the
21 microwave oven manufacturing industry now range from
22 approximately a negative 52.9 million to minus 73.6
23 million, which is a change of either minus 4.7
24 percent to minus 6.5 percent, depending on which
25 markup scenario is being analyzed.

1 The base case industry value is estimated
2 to be $1.1 billion in 2010 dollars, and the required
3 conversion costs are estimated to be 94.7 million at
4 TSL-3, and this primarily relates to increased
5 budgets for research and development efforts
6 necessary to bring products into compliance. As an
7 indication of the magnitude of these conversion
8 costs, the cash flow in the year preceding the
9 standard date decreased by approximately 29.9
10 percent to $59 million dollars, compared to a base
11 case value of $84.2 million dollars.
12 The incremental changes to manufacturing
13 production costs at TSL-3 are estimated to be $1.31
14 for product class one and $9.44 for product class
15 two. The range of these impacts on the cash flow at
16 TSL-3 varies depending on the ability of
17 manufacturers to pass through these costs to their
18 customers and those effects are modeled in the
19 different markup scenarios, which, for reference,
20 are the preservation of gross margin as a percentage
21 or in absolute dollars.
22 Aside from the impacts on industry net
23 present value, the manufacturing impact analysis
24 also tracks the impact on domestic manufacturing,
25 but since the vast majority of these products are

1 made overseas, we anticipate those effects to be
2 small.
3 I guess at this point in time I should
4 take any questions on the MIA, and the adjustments
5 we made to the analysis. (No response.)
6 Okay. With that, I'll move on.
7 **Proposal for New Standard Levels**
8 MR. BARRINGTON: I'm just going to walk
9 you through our proposal for the new standard
10 levels. So, DOE considered four TSLs in evaluating
11 this SNOPR and we worked down to where the benefits
12 of potential standards would outweigh the potential
13 burdens. Right now DOE tentatively concludes that
14 at TSL-4, the benefits of energy savings, economic
15 gain, and the emissions reductions would be
16 outweighed by the potential economic burden on
17 consumers from loss of product utility. That
18 primarily relates to the automatic off mode that we
19 analyzed as part of TSL-4, as well as the large
20 capital conversion cost that would result in a
21 reduction of INPV for manufacturers.
22 However, once past TSL-4, we get to TSL-3,
23 which DOE tentatively concludes saves a significant
24 amount of energy and is technologically feasible
25 and economically justified.

1 And so just a few of the quantitative
2 highlights of TSL-3:
3 • The national energy savings for product class
4 one is shown in the left-most column, are 0.41
5 quads, and for product class two are one-one-
6 hundredth of a quad.
7 • At the three percent discount rate, the net
8 present value for the NIA is $3.58 billion
9 dollars, and $1.81 billion dollars at the
10 seven percent discount rate.
11 • For product class two, they're significantly
12 less, two-hundredths of a billion dollars, and
13 one-one-hundredth of a billion dollars.
14 • And the industry net present value is shown to
15 be millions, not billions – I'm trying to keep
16 my units straight here. So $1031 million
17 dollars, so one billion, 31 million dollars to
18 $1,050 million dollars for product class one,
19 which is a change in net present value of 6.5
20 to 4.8 percent negative. For product class
21 two, that's an INPV of $22 million dollars, to
22 – sorry, $22.3 million dollars to $23.9
23 million dollars for product class two, which
24 is a decrease in INPV of 7.1 to 0.3 percent.

1 A lot of numbers, so if anyone has any
2 comments.
3 MR. BROOKMAN: Comments or questions on
4 this summary slide on proposed standards? Nothing
5 additional? Okay.
6 MR. BARRINGTON: Okay. With that, I think
7 from here, it's just instructions on how to submit
8 written comments.
9 MR. BROOKMAN: There is, as provided in
10 the agenda, another opportunity for anybody that
11 wishes to, to make additional comments, or raise
12 issues that haven't been raised fully so far. I
13 see no additional comments at this time, I'll just
14 turn it back to Wes Anderson.
15 **Next Steps**
16 MR. ANDERSON: I'd like to - also you can
17 submit your comments through the government web
18 site, by - and if you do a search on the reference
19 docket number or the RIN number, or you can type in
20 the title of the rule, you can find all the
21 comments that are submitted for this particular
22 session. And if you want to do something, if you
23 want to send it by the old fashioned method, the
24 address is there.
25 I'd like to thank you guys for coming out.

1 It’s a beautiful day so I can understand why we have
2 such a low turnout, but I’d also like to thank the
3 people on the webinar session. This is a new
4 process and we appreciate your patience and also
5 submitting your comments and questions. If there
6 are no further requests from the group, I’d like to
7 adjourn the meeting, and have a nice day.
8 (Whereupon, at 10:54 a.m., the meeting in
9 the above captioned matter was adjourned.)
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**REPORTER'S CERTIFICATE**

This is to certify that the attached proceedings before:

**U.S. DEPARTMENT OF ENERGY**

In the Matter of:

**PUBLIC MEETING ON ENERGY CONSERVATION PROGRAM: ENERGY CONSERVATION STANDARDS FOR STANDBY MODE AND OFF MODE FOR MICROWAVE OVENS**

Were held as herein appears and that this is the original transcript thereof for the file of the Department, Commission, Board, Administrative Law Judge or the Agency.

Further, I am neither counsel for or related to any party to the above proceedings.

*Wendy Greene*
Official Reporter

Dated: March 19, 2012