

UNITED STATES DEPARTMENT OF ENERGY
OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY

**PUBLIC WORKSHOP ON A RULEMAKING TO CONSIDER
ENERGY EFFICIENCY STANDARDS
FOR RESIDENTIAL FURNACES AND BOILERS**

Room 1E-245
United States Department of Energy
Forrestal Building
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Tuesday, July 17, 2001

9:00 a.m.

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A G E N D A

Purpose of the Workshop:

The purpose of this public workshop is to hear the views of interested persons on the issues and processes involved in a rulemaking to consider updated energy efficiency standards for residential furnaces and boilers. The Department will consider the views presented and comments submitted in formulating its approach in the rulemaking.

<u>AGENDA ITEM:</u>	<u>PAGE:</u>
I. Opening Remarks and Introductions	5
II. Agenda Review	15
III. Residential Furnaces and Boilers - Topics for Discussion	
A. Introduction	20
B. Market and Technology Assessment	
1. Overview	34
2. Product Classes	49
3. Baseline Residential Furnaces and Boilers	54
4. Screening Analysis	81
C. Engineering Analysis	
1. Overview	96
2. Retail Prices, Markups, and Installation Cost	129
<u>Afternoon Session</u>	
III. Residential Furnaces and Boilers - Topics for Discussion (Continued)	
C. Engineering Analysis (Continued)	
3. Electricity Consumption	146
D. Life Cycle Cost Analysis	178

A G E N D A

<u>AGENDA ITEM:</u>	<u>PAGE:</u>
III. Residential Furnaces and Boilers - Topics for Discussion (Continued)	
E. Consumer Subgroup Analysis	210
F. National Energy-Saving and Net Present Value Analysis	213
G. Manufacturer Impact Analysis	228
H. Employment Impact Analysis	232
I. Utility Impact Analysis	235
J. Environmental Analysis	239
IV. Adjournment	

P R O C E E D I N G S

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
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19
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9:00 a.m.

I. Opening Remarks and Introductions

MR. BROOKMAN: Okay. Let's -- let's get started. Please take your seats.

(Pause)

MR. BROOKMAN: We have a few more spaces up here at the table for members of industry and the like.

Good morning, everybody, and welcome. My name is Doug Brookman. I'm the president of a small company -- you can't hear me? President of a small company called Public Solutions in Baltimore, Maryland, and I facilitate meetings like this a lot.

Let me welcome you and thank you for being here on time so we can get going with this workshop today.

This is the framework workshop for the public workshop on a rulemaking to consider energy efficiency standards for residential furnaces and boilers.

So, before anything else, let me introduce Cyrus.

MR. NASSERI: Thank you very much, Doug.

And welcome to this workshop. My name is Cyrus Nasser, and I'm a program manager for Department of Energy's rulemaking on residential furnaces and

1 boilers. And this is the first meeting of this
2 rulemaking as we are here today. And again, welcome,
3 everybody, to this meeting.

4 What I would like to accomplish today is to
5 get your comments. And it looks like we have more
6 seats available if some people -- we kind of speculated
7 or projected who is going to show up and we put some
8 name tags, but if you -- if the people are not, you're
9 welcome to join around the table here and over the
10 sides so we have a better way of having discussion for
11 today's workshop.

12 The issues that I would like to -- for us to
13 discuss today are basically -- were raised in the
14 framework document that we published last month,
15 exactly -- I think it was on -- on 19th of June. The -
16 - actually, we did not publish. We put it on our Web
17 site and we publish the same day a notice, which in
18 that notice we announced the availability of that
19 framework document. And today I'm hoping that
20 everybody has seen that document, read it, and the
21 issues that we have raised in that document are
22 basically some interest to you and we can discuss
23 further through the remainder of the day.

24 Talking about this notice, we also, in that
25 notice we published, we said the fact that you have one

1 month from today -- in other words, August 17th -- to
2 -- for us to receive your written comments. Throughout
3 today we're going to discuss issues. But obviously,
4 there -- there are cases that we won't be able to
5 elaborate or extensively discuss those issues and you
6 are welcome to -- to send your comments -- written
7 comments talking about those issues in more extensive
8 way or the way you want to present it and also come out
9 with the new issues that you would like to bring it to
10 our attention during your comment period of one month.

11 The written comments, there basically is very
12 clearly stated how you forward it to DOE, to whom, and
13 to what address.

14 And also, I would like to mention a few
15 things on the way you send your comments. Sometime in
16 past that you were sending it electronically. If you
17 do that, we would like you to use WordPerfect, and
18 WordPerfect is only basically thing that we accept even
19 though we'd be able to -- to use Word, Microsoft Word,
20 but WordPerfect is preferable means of sending your
21 electronic files.

22 The other issue that I would like to mention
23 at this point, if you are using e-mail to send
24 something here, that e-mail is fine and usually that --
25 you send that according to the -- to the notice we

1 published to Brenda Edwards-Jones. But remember that
2 for us to -- to -- to put your comments in the docket
3 for this rulemaking we have to have your signed hard
4 copies. So, when you do this, mail us your signed hard
5 copies also for our docket. And also, what we put in
6 the Freedom of Information reading room for anybody
7 who's so interested to -- to read those comments.

8 The last thing I would like to mention at
9 this point is in -- if there is any foreign visitors
10 who are not American citizens, we would like to have at
11 least four weeks, in that nature one month, to send us
12 the proper documents for our office -- the proper
13 office to go through the clearance process and so
14 forth. And this -- this happens, so this would be
15 applied to the future workshops.

16 Again, welcome you. And what I would like to
17 do at this point before I turn the meeting over to our
18 facilitator Doug Brookman for this workshop meeting, I
19 would like to introduce the team that are going to work
20 on this rulemaking.

21 From our Program Office, my office, we have
22 Sandy Bell sitting back there and Brenda Edwards-Jones
23 and Crystal Brunson. Is she here? She is a summer
24 student that would be -- is helping us for this -- of
25 this workshop and everything else.

1 Also, we don't have Carl Adams. Carl Adams
2 -- everybody knows Carl. He's an old-timer just like
3 myself here. And Carl is having a new assignment,
4 which basically is going to look at all the rulemaking
5 coordination. In other words, at the present time we
6 have this rule, we have transformers, we have -- let's
7 see -- small motors determination, we have residential
8 furnaces -- I mean residential air conditioners and
9 heat pumps and commercial air conditioners. So, a few
10 rules are in progress at the present time and Carl is
11 responsible to coordinate that.

12 Okay. That's from the Program Office.

13 The Lawrence Berkeley Laboratory is headed by
14 Jim McMahan and also Jim Lutz back there and Alex Lekov
15 is working on this. And obviously, we are going to
16 have other people when it gets to economic analysis and
17 other things that are going to work on this program.

18 From -- let's see -- let's see -- I'm getting
19 Alzheimer a little bit.

20 (Laughter)

21 MR. NASSERI: We basically have today -- yes,
22 thank you -- Mark Kendall leads that team, and then we
23 have Stefano Ratti is seeming up. And obviously, I
24 see Mike Rivas there. I don't know what his
25 participation would be in this rule, but he's here.

1 (Laughter)

2 MR. NASSERI: From -- from ADL. And also, we
3 have here B.J. Kumar from Energetics who is basically
4 working on coordination of the material and peer review
5 of certain issues when it gets to that -- to that
6 point.

7 And this is the team. And also -- let's see
8 -- any other support people that we --

9 MR. BROOKMAN: I think we nearly forgot --
10 all the way around.

11 MR. NASSERI: Right. Okay. Now I'm going to
12 -- looks like Doug is saying I'm saying too much. Now
13 I'm going to turn to Doug for the rest of the agenda --

14 (Laughter)

15 MR. NASSERI: -- and other things to review.

16 Thank you very much, Doug.

17 MR. BROOKMAN: Thank you, Cyrus.

18 I'd like to have everybody have a chance to
19 introduce him- or herself, and I'll start with Joe
20 Mattingly and go around the table and then go the rest
21 of the room.

22 Joe? Your name and organizational
23 affiliation, please.

24 MR. MATTINGLY: Joe Mattingly with Gas
25 Appliance Manufacturers Association.

1 MR. STANONIK: Frank Stanonik with GAMA.
2 MR. DEMPSEY: Dan Dempsey with Carrier.
3 MR. RANFONE: Jim Ranfone, American Gas
4 Association.
5 MR. MULLEN: Jim Mullen, Lennox.
6 MR. LYNCH: Greg Lynch with Amana.
7 MR. CUI: Shuqing Cui, Weil-MacLain.
8 MR. ROCKY: Bryan Rocky from York.
9 MR. SUBHERWAL: Bodh Subherwal, BR Lab.
10 MR. MARRAN: John Marran, Energy Kinetics.
11 MR. STEPHENS: Charlie Stephens, Oregon
12 Office of Energy.
13 MR. MARTIN: Michael Martin, California
14 Energy Commission.
15 MR. PRINDLE: Bill Prindle, Alliance to Save
16 Energy.
17 MS. MEYERS: Karen Meyers, Rheem.
18 MR. CRAWFORD: Jim Crawford, Trane Company.
19 MR. SACHS: Harvey Sachs, ACEEE.
20 MR. ADAMS: Carl Adams, Department of Energy.
21 MR. KENDALL: Mark Kendall, Arthur D. Little.
22 MR. McMAHON: Jim McMahon, Lawrence Berkeley
23 National Lab.
24 MR. NASSERI: Cyrus Nasserri again, DOE.
25 MS. PINTO: Francine Pinto, Office of General

1 Counsel, DOE.

2 MR. BROOKMAN: And go over here, please?

3 MR. WEISS: Cory Weiss, Effikal
4 International.

5 MR. STUDEBAKER: Henry Studebaker, Department
6 of the Navy.

7 MR. POINT: Nathan Point, Burnham
8 Corporation.

9 MR. GLASS: Robert Glass, Lochinvar.

10 MR. BIXBY: David Bixby, GAMA.

11 MR. ROUNTREE: Glynn Rountree, GAMA.

12 MR. BATEY: John Batey, Oil Heat
13 Manufacturing Association.

14 MR. ALBRECHT: Ray Albrecht, New York State
15 Energy Research and Development Authority.

16 MR. HEMPHILL: Bob Hemphill representing the
17 Institute of Gas Technology.

18 MR. BRUNDAGE: Don Brundage, Southern
19 Company.

20 MR. FARKAS: Tom Farkas, the Edison Electric
21 Institute.

22 MR. HOLT: John Holt, National Rural Electric
23 Cooperative Association.

24 MR. KUSTERER: George Kusterer of Bock Water
25 Heaters.

1 MR. HAAG: Wilbur Haag, A.O. Smith Water
2 Products Company.

3 MR. CALDARERA: Mike Caldarera, National
4 Propane Gas Association.

5 MR. AMICK: Gary Amick, Slant/Fin
6 Corporation.

7 MR. ROCHLER: George Rochler, Schott Gas and
8 --

9 MR. STEYER: Richard Steyer --

10 MR. F. WALTER: Frank Walter, Manufactured
11 Housing Institute.

12 MR. WINIARSKI: Dave Winiarski, Pacific
13 Northwest National Laboratory.

14 MR. SOMASUNDARAM: Sriram Somasundaram,
15 Pacific Northwest National Laboratory.

16 PARTICIPANT: Tom -- Office of Energy
17 Efficiency, National --

18 PARTICIPANT: -- Department of Energy.

19 MR. RAVA: Jim Rava, Department of Energy.

20 PARTICIPANT: -- DOE.

21 PARTICIPANT: -- IST.

22 MR. BARBE: Mark Barbe, Thermo Dynamics.

23 PARTICIPANT: Harvey --

24 MS. EDWARDS-JONES: Brenda Edwards-Jones,
25 Department of Energy.

1 MR. GUZMAN: Tony Guzman, DOE.

2 MR. KAHN: Mohammed Kahn, DOE.

3 MR. ROBINSON: -- Robinson, DOE.

4 MR. RIVAS: Michael Rivas --

5 MR. KINKADE: Mike Kinkade, DOE.

6 MS. HORN: -- Horn, American Council for
7 Energy --

8 MR. BEDINGER: Brian Bedinger, DOE.

9 MR. LEKOV: Alex Lekov, Lawrence Berkeley
10 National Laboratory.

11 DR. LIU: Chin Liu, same place.

12 PARTICIPANT: -- Arthur D. Little.

13 MR. KUMAR: B.J. Kumar, Energetics.

14 MS. BELL: Sandy Bell, DOE.

15 MR. BROOKMAN: Thank you. Anybody that did
16 not get a chance to introduce him- or herself?

17 (Pause)

18 MR. BROOKMAN: Thank you all. Thanks to all
19 of you for being here on time. We have an interesting,
20 I think, and a pretty full day ahead of us.

21 I thought we'd get a show of hands. How many
22 of you have not had a chance -- how many of you are
23 attending a workshop sponsored by the Department of
24 Energy like this for the first time?

25 (There was a show of hands.)

1 MR. BROOKMAN: So, we have a good number of
2 you that have -- this is your first occasion to come to
3 one of these workshops. Let me welcome you especially
4 on behalf of the Department.

5 II. Agenda Review

6 MR. BROOKMAN: I'm going to do a brief agenda
7 review, talk about some ground rules, and then we're
8 going to go straight into the presentations at hand
9 here. I think all of you have a copy of the agenda in
10 your -- in your packet.

11 This session is what's called the framework
12 workshop or the framework meeting where the Department
13 hopes to -- pardon me -- the Department hopes to
14 describe to all the people in the room and beyond this
15 room how they intend to do the work, the shape of the
16 analysis, begin to describe the different analytic
17 pieces, and particularly begin to get your input about
18 how to do it, your thoughts, ideas on some rather
19 specific questions prior to beginning the analysis.

20 So, today is an opportunity for you to shape
21 what they do somewhat. I think you'll find that some
22 of the questions are quite detailed, some of the
23 questions are quite global. It may be easy for you to
24 respond to some of these today. Others might take
25 further consideration or be answered further

1 downstream.

2 So, we have a mix and a match in what you're
3 going to see here today and the general format is a lot
4 of presentation material that's fairly condensed, an
5 opportunity then for everybody in the room to comment
6 and ask questions as well. That's the general format.

7 So, if you look at your agenda, I'm doing the
8 agenda review right now. We'll go from that to a few
9 other things.

10 We're going to start off this morning with an
11 introduction on the background on energy efficiency
12 rulemakings, go from there to market and technology
13 assessment. Mark Kendall and Jim McMahon will handle
14 those presentations you see there one through four.

15 We'll go from there to describing the
16 engineering analysis. These are -- the descriptions
17 are generally the -- the process elements. That is,
18 the general things that are going to be undertaken in
19 each of those categories.

20 Probably in that general range there, after
21 engineering analysis or perhaps after life cycle cost
22 analysis we'll pause for lunch. When -- when -- this
23 workshop today is less defined than many of them
24 because we don't know really how much time and energy
25 will be spent on any one of these topics. But round

1 about noon, no later than 12:15 of 12:30 we'll pause
2 for lunch.

3 Moving on, we'll do life cycle cost analysis,
4 consumer subgroup analysis, national energy saving and
5 net present value analysis, manufacturer impact
6 analysis, employment impact analysis, utility impact
7 analysis, environmental analysis, and adjournment
8 probably 4:30 today at the latest would be my guess.
9 It's very possible we'll get through the day early, but
10 a lot of you are new here in the room so it may take
11 more time to kind of answer your questions as we're
12 going along. That's part of the Department's
13 intention, to try and answer as many questions as we
14 can at this stage, get as much input as you can provide
15 at this stage.

16 Questions about this agenda?

17 (No response)

18 MR. BROOKMAN: Does anybody in the room have
19 a specific issue that would not be able to fit in the
20 content of what's here described?

21 (No response)

22 MR. BROOKMAN: I see nothing else. Okay. If
23 we find a cleaner, more direct pathway we'll take it as
24 the day goes on.

25 I'm going to suggest, for those of you that

1 are new especially, what have emerged as norms for
2 these workshops -- we've conducted with the Department
3 of Energy and myself facilitating I think at least
4 perhaps dozens of these workshops now. And what have
5 emerged as norms are I'm going to ask simply that
6 everyone speak one at a time. Please say your name for
7 the record. This is recorded and there will be a court
8 report -- record of this meeting.

9 I'm going to ask also that you listen as an
10 ally. Everybody that's worked with me before gets
11 tired of me saying it. The quality of the discussion
12 hinges in -- entirely on the quality of the listening.
13 Please listen as an ally; it'll help us all.

14 I'm going to also ask that you keep the focus
15 here. Turn off your cell phones or put them on
16 vibrating. Turn off your pagers and we'll all get
17 through the day a lot more gracefully and quickly.

18 And -- and I'm also going to be cuing people
19 to speak. That is, I'll be recognizing person-by-
20 person but I'm also going to be allowing follow-on
21 comments. So, please make it possible for me to do
22 this gracefully. Try and keep your comments short.
23 Try and share the air time. That'll make it easier for
24 all of us.

25 So -- so, that's my spiel. That's my

1 starting point statement about the way we hope to run
2 this meeting today. Questions, comments about that?

3 (No response)

4 MR. BROOKMAN: I have a few more housekeeping
5 items. The bathrooms -- we'll take a break mid-
6 morning, by the way, probably around about 10:30,
7 10:45. There's a bathroom down at that end of the hall
8 and down at that end of the hall, both a ladies' and a
9 men's.

10 When we get to lunch I'll describe where the
11 food is.

12 They take security very seriously in the
13 Department of Energy here in the Forrestal Building.
14 Please wear your name tags, your -- your -- your passes
15 around in the building.

16 Have you described what's going on with
17 property passes yet? No?

18 If you brought a computer into this room --
19 into the building today and/or a cell phone, anything
20 of value, you need a property pass before you can get
21 it back out the door. So, if this meeting goes 'til
22 4:30 today and you're dashing for the airport and you
23 haven't got a property pass in your hands, they're
24 going to detain you at the door and ask you where you
25 got that computer. So, if you haven't got a property

1 pass at this point, speak to Brenda or to Crystal and
2 they'll get you one, okay?

3 And I think that's it. Any other
4 housekeeping items that I've forgotten?

5 (No response)

6 MR. BROOKMAN: If you haven't signed in,
7 please do so. They -- we keep a record of who's
8 attending these meetings and so that's important.

9 Final questions or comments before we --
10 proceed to the presentations?

11 (No response)

12 MR. BROOKMAN: Okay. I see none.

13 So, Cyrus, you're doing the overview.

14 MR. NASSERI: Thank you.

15 (Pause)

16 III. Residential Furnaces and Boilers -

17 Topics for Discussion

18 A. Introduction

19 (Slide)

20 MR. NASSERI: Good morning, again. And this
21 part of my presentation is basically the -- the
22 background information on the Energy Policy Act and
23 also overview of what would come in detail and next in
24 presenters.

25 Before I do that, I forgot to mention part of

1 the team, the General Counsel Office. Gene Margolis
2 was working with us and also Francine Pinto, who's
3 here. And Gene has some medical testing today and he's
4 not able to attend this meeting. Well, I don't know --
5 he might come in later but not at this time.

6 And also, in Policy Office we have Mark
7 Fredricks, who's not -- who's not here but working --
8 teaming with us for this rulemaking.

9 Let's see.

10 (Slide)

11 MR. NASSERI: Okay. Why are we here and why
12 you're doing this, what we're in this meeting today.

13 The Energy Policy Act -- Conservation Act of
14 1975, which National Appliance Energy Conservation Act
15 of 1987 amended that, established standards and EPCA
16 requires that -- that we do rulemaking. Specifically,
17 the Energy Policy and Conservation Act not only
18 requires that we have to update energy efficiency
19 standards for covered products, which residential
20 furnaces and boilers are part of that, also give
21 detailed guidelines on how we have to go about it.

22 Perhaps the most crucial guideline as we see
23 listed here is the standard must achieve the maximum
24 improvement in energy efficiency, be technologically
25 feasible, and economically justified. This is true for

1 all the covered products.

2 Now, let me go ahead to the -- specifically
3 to the residential furnaces and boilers.

4 (Slide)

5 MR. NASSERI: Residential furnaces and
6 boilers are covered product under EPCA and that's --
7 the paragraph refers to that. EPCA set initial
8 standards, as I mentioned, in 1987 for these products
9 and for all furnaces, as you're all probably aware of
10 that by now, the 78 percent annual fuel utilization
11 efficiency. That's the standard that EPCA assigned to
12 -- for these products.

13 And for boilers, gas steam boilers have a
14 little bit lower standard, 75 percent. And other
15 boilers, oil and gas, they have 80 percent AFUE.
16 Mobile home furnaces are a little bit different, and
17 they established 75 percent AFUE for those.

18 And for smaller furnaces, less than 45,000
19 Btu, the EPCA asked DOE --

20 (Slide)

21 MR. NASSERI: -- to establish standards, and
22 they give us a range of that, 71 percent to 78 percent.
23 And that -- they say that -- that -- establishing that
24 minimum, that would apply to the products manufactured
25 on or after 1/1/92.

1 And also mentioned the fact that this
2 determination of the standard should not likely to
3 cause any fuel switching.

4 The mobile home furnace provision has two-
5 stage rulemaking. They -- the EPCA set DOE to publish
6 a final rule by 1/1/92 to determine if the 78 percent
7 originally established by EPCA needs to be amended.
8 And then include that with the rest of the boilers and
9 furnaces and do another rulemaking for that products,
10 see if the standard should be revised, and that would
11 be effective on 1/1/94.

12 (Slide)

13 MR. NASSERI: Other provisions were that
14 publish final rule, determine if all the residential
15 furnace and boilers, and this is by 1/1/94, and
16 whatever that amendment is, that would apply to the
17 products on or after 1/1/2002.

18 Between 1997 and 19 -- and 2007 EPCA says
19 publish a final rule to determine whether all the
20 residential furnace and boiler standards in effect for
21 such products should be amended and, if there is such
22 an amendment, that would apply to the products on or
23 after 1/1/2012.

24 (Slide)

25 MR. NASSERI: Obviously, as you know, we are

1 not on the schedule of EPCA just -- today. And these
2 are basically some of the reasons that -- why we are
3 not -- we were not able to catch up with the -- with
4 the schedule that EPCA required DOE to do the
5 rulemaking.

6 In 1996, as you recall, there was a
7 moratorium by the -- by the congress not to publish any
8 standards and there was question concerning that. And
9 as a result of that, we basically went and do some
10 improved process rule we called it, and then we stated
11 that what we would like to do basically to refine the
12 analyses or our -- our work and also how we're going to
13 prioritize certain products so we can catch up with the
14 schedule which is assigned to us.

15 And those process improvement would apply to
16 the, basically, the product before the notice of
17 proposed rulemaking, which is the second stage of the
18 standard rulemaking. And DOE would revise the rules
19 that was done by that time which was basically the
20 mobile home furnace in the stage of NOPR, which was
21 past the ANOPR phase. And also by that time we had
22 another rule for other furnaces that I'll mention
23 later.

24 And also assigned a low priority -- and the
25 reason for this delay also was that as part of this

1 process improvement we should assign the priority for
2 doing and these product, furnace and boilers, were
3 assigned a low priority. So, finally, in -- for this
4 year we had assignment of the high priority for these
5 products and that's why we are here to start rulemaking
6 on these products.

7 (Slide)

8 MR. NASSERI: The current status, I would
9 like to go over that real fast. The small furnaces
10 that we talked, the 45,000 Btu and less, we have done
11 the final rule on that in 11/17/89 and established a 78
12 percent AFUE which basically applied to the rest of the
13 furnaces. So now all the furnaces having the same
14 minimum efficiency standards.

15 And for mobile home furnace, as a part of the
16 larger activity of A279 products, then became A
17 products, we did go through the ANOPR phase, you --
18 some of you might remember, and then the NOPR phase,
19 and we published the NOPR on 3/4/94. And also, all
20 these are remembered that this was prior to our process
21 improvement that we published later on, which was in
22 1996.

23 Other provision. First revision of the
24 standards for the furnace and boilers as a part of
25 other three products as we called it, we did the ANOPR,

1 which were published in -- on September 8, 1993, and
2 the effective date obviously was 1/1/2002. And we did
3 not go any further than that at that time. And
4 obviously, the second revision of the standard was by
5 -- by EPCA was after that, and effective date for that
6 was 1/1/2012, which obviously we did not do since we
7 haven't completed the first stage of the rulemaking.

8 (Slide)

9 MR. NASSERI: Now, let's go to mobile home
10 furnace -- since mobile home furnace are -- are kind of
11 unique in this rulemaking -- I think -- I would like to
12 basically mention that separately and see -- and then
13 we have a discussion on that later on.

14 The mobile home furnace under the EPCA had
15 two-phase rulemaking. As I mentioned, the original
16 standard for that in 1987 was 75 AFUE and EPCA said
17 that we should visit that standard and by 1/1/94 we
18 should have amended those effective at that date. As I
19 mentioned, we stopped at the NOPR phase and we didn't
20 go further to final rule on that. And then the final
21 rule, according to EPCA, was effective by 1/1/2002.

22 Well, this one, basically, the final rule.
23 This is for including -- the second phase of this
24 rulemaking, including that amendment -- the first
25 amendment with the rest of the furnaces and boilers to

1 the second one, which would be the effective 1/1/2002.
2 Obviously, we are -- we are -- we have not met the
3 statutory timeline and we recommend today for
4 discussion the following.

5 The first stage of the -- of the rulemaking
6 for first -- for mobile home furnaces should be at --
7 we should adopt intermediate efficiency, obviously
8 something higher than 75 percent AFUE and certain
9 earlier dates -- effective dates for that as compared
10 to the rest of the furnace and boilers. And then as a
11 second stage of this activity, to include that with the
12 rest of the furnaces and boilers and do that rulemaking
13 with a later effective date.

14 (Slide)

15 MR. NASSERI: Okay. Standard-Setting Process
16 Timeline, which you have it in your package which you
17 should have in front of you. The vertical line shows
18 where we are today, this workshop, July 2000. And the
19 left-hand side of this column shows that what we have
20 done so far, which I just mentioned. I don't want to
21 go over that again.

22 What we are doing now, doing from here today
23 going to the right side, which this -- this is a
24 standard thing. We're document meeting today. And
25 obviously, we're going to hear your comments,

1 discussions, and then we'll refine analyses. And then
2 the first stage of this rulemaking would be the advance
3 notice of proposed rule, and then that we are
4 speculating happens sometime in 2002. And a year
5 later, which we are basically -- traditionally expect
6 to take one year for each of these phases of
7 rulemaking, from ANOPR to NOPR and then from NOPR to
8 final rule. So, another year for notice of proposed
9 rule and another year, finally in 2004 a final rule
10 with the determination of the standard rulemaking for
11 furnaces and boilers.

12 I should mention -- mention one thing, that
13 any of these phases of rulemaking we are going to have
14 a public workshop, public hearing, public meetings,
15 whatever is necessary in order to resolve your comments
16 and -- and any concerns that you have during that
17 process for our work.

18 And then we are speculating that, as I
19 mentioned, the -- the -- the mobile home furnace
20 standard effective date would be a little bit earlier
21 than the rest of the furnaces and boilers, roughly in
22 2006 it shows here and then in 2012 the revision for
23 the -- for the rest of the furnaces and boilers.

24 (Slide)

25 MR. NASSERI: Okay. This is -- you have this

1 in front of you. Very difficult to read and I think I
2 have to probably do some understanding to read this.
3 This is basically the analytical framework for
4 residential furnaces. And then you notice the boxes we
5 have on the right side, in the -- in the right lower
6 corner of each box we basically have the -- the -- the
7 numbers are related to the sections of the framework
8 document.

9 And one thing I would like to mention here is
10 that -- that each phase of that activity, which you
11 start, let's say, from market and technology amendment
12 there -- I mean -- I can't even read it. And that kind
13 of activity would be -- the output of that would be the
14 input to the next phase of rulemaking, which would be
15 screening analyses, and the output of that to the
16 engineering, and so forth to the -- to the publication
17 of the ANOPR. And those -- the following presenters
18 would present these issues in more detail after I -- I
19 finish.

20 (Slide)

21 MR. NASSERI: Okay. Discussion of topics
22 that we're going to have. Again, this is an overview
23 of what I have here really fast and then we'll follow
24 up by -- by Lawrence Berkeley Laboratory with Jim
25 McMahon who's going to present that and then also Mark

1 Kendall from Arthur D. Little to present some of the
2 manufacturing impact analyses and -- and other sections
3 of this rulemaking.

4 Market and Technology Assessment. Obviously,
5 there product classes would be determined, baseline
6 residential furnaces and boilers, the screening
7 analysis. Those are some of the things that would be
8 done at that phase of -- of analyses. And ADL would
9 present that.

10 The engineering analyses, basically using the
11 input from that activity we'd do the retail prices,
12 markups, and installation costs. And one area of
13 electricity consumption of these furnaces that we would
14 like to discuss further, that would be presented by
15 Lawrence Berkeley Laboratories.

16 (Slide)

17 MR. NASSERI: Other Analyses that we're going
18 to do and we're going to talk about it with the
19 presenters in detail would be the -- basically, part of
20 the engineering analysis, life cycle cost analyses and
21 some consumer subgroup analyses and some net present
22 value and -- I mean national energy saving and net
23 present value analyses. And further, manufacturer
24 impact analysis, which would be presented by ADL,
25 again. And employment, utility, and environmental

1 analysis would be presented to you by Jim McMahon.

2 (Slide)

3 MR. NASSERI: Next Steps. Incorporate
4 comments that we're going to hear from you today, and
5 it's going to be on the -- on the record with the court
6 reporter, and you'll be able to get that in a matter of
7 two weeks. And you have to talk to the gentleman down
8 to my right side for getting that court report, the
9 transcripts of today's workshop.

10 Then, we basically fine-tune analytical
11 approach by -- by the comments received today and also
12 by the comments we receive by the end of the comment
13 period, which is a month from now, August 17th, 2001.
14 And then we are planning to -- to publish the notice by
15 -- some of the dates might be wrong here. Let's see.
16 By -- by 2001. Well, from this date of today,
17 obviously, or actually, from date of the termination of
18 the comment period to the -- to the year later after
19 that would be the publication of ANOPR. And then, a
20 year after that would be the NOPR -- publication of
21 NOPR, and finally, in some -- sometime in 2004 we would
22 like to have the final rule published to the revised
23 standard for these products.

24 At this point I would like to entertain any
25 comments, Doug, if anybody has any comments.

1 (Pause)

2 MR. NASSERI: The gentleman down there.

3 MR. BROOKMAN: Please use the microphone,
4 sir, and -- and say your name for the record.

5 MR. F. WALTER: A small comment. Frank
6 Walter, Manufactured Housing Institute.

7 Mobile home furnaces were built -- were made
8 many, many years ago. In 1976 the Federal government
9 took over the program and the name was changed to
10 manufactured homes. Manufactured home furnaces are
11 down-flow furnaces. Now, perhaps someone in the room,
12 a product supplier can correct me on that, but my
13 knowledge is that so-called mobile home furnaces are
14 down-flow. We suggest you change the name to "down-
15 flow furnace" or "manufactured home furnace." "Down-
16 flow" is probably more descriptive.

17 MR. BROOKMAN: That's the kind of comment
18 that --

19 MR. F. WALTER: Thank you.

20 MR. BROOKMAN: -- hope to get today. And as
21 we go into the detail, we're not going to get into the
22 -- the issues surrounding that now, but if we get into
23 it today we'll discuss these issues.

24 Jim, a comment before we move on?

25 MR. CRAWFORD: Jim Crawford, Trane Company.

1 Very quickly, "down-flow" would be a totally
2 unacceptable title because there are lots of down-flow
3 furnaces which are not used in manufactured homes.

4 MR. BROOKMAN: Okay. Well, we'll discuss
5 that further.

6 (Slide)

7 MR. BROOKMAN: Let me just point to the
8 analytic framework that's up here on this board -- on
9 the -- on the screen. For those of you that are new to
10 this process, this very complicated flow chart is, I
11 think, perhaps the best sort of comprehensive index
12 that you can look in one place, at least from my
13 perspective, and see the different elements, the
14 different pieces, how they flow and fit together.

15 And what we hope to do today is many of these
16 boxes that you see in the middle of this flow chart
17 provide a brief description of the primary analytics
18 and the primary processes that get you these products.
19 That's the hope and the expectation of today, okay?
20 And then your comments on those.

21 Questions before we proceed with our first
22 presenter?

23 (No response)

24 MR. BROOKMAN: Okay. Let's start. Mark
25 Kendall from Arthur D. Little.

1 Thank you, Cyrus.

2 (Pause)

3 MR. BROOKMAN: As you look forward to the
4 presentation packet itself I think you'll find Mark's
5 first presentation, you have it. And interspersed
6 among the content are questions for you to consider as
7 -- as we're going along and we'll stop where there are
8 questions and try and entertain questions -- answers at
9 that point.

10 Mark Kendall.

11 B. Market and Technology Assessment

12 1. Overview

13 MR. KENDALL: Thank you. Is this on?

14 MR. BROOKMAN: Yes, it's on.

15 MR. KENDALL: Okay. Just one more comment on
16 the general process and what's going to happen today
17 before I begin. Back to the flow chart, you see this
18 double line about halfway through where the ANOPR comes
19 in. What we hope to do today is really focus in detail
20 on these blocks that occur before the ANOPR because
21 what's going to happen after this meeting and after all
22 the comments come in over the next month, we're going
23 to go out and -- and start doing the analysis and
24 really proceed until the point the ANOPR's published
25 before we have a good stopping point again to regroup

1 and start anew.

2 So, we do have on the agenda blocks
3 addressing each one of the topics after the ANOPR but
4 we intend to present those as just a very quick
5 overview just so that you'll be aware of what's going
6 to occur later in the analysis.

7 MR. BROOKMAN: And ANOPR stands for Advance
8 Notice --

9 MR. KENDALL: That's right.

10 MR. BROOKMAN: -- Of Proposed Rulemaking.
11 Advance Notice of Proposed Rulemaking.

12 (Slide)

13 MR. KENDALL: Okay. So, I'm presenting the
14 first part of the first box, which is the market and
15 technology assessment.

16 The point of the market and technology
17 assessment is really to just gather the basic data
18 about the products that are involved in the rulemaking
19 so that it stimulates in our mind questions that we
20 have. It provides a basis for the rest of the
21 analysis. And we have some of the basic information
22 that we've gathered we've laid on the table by the
23 door. I think we only brought about 20 copies.

24 That's not going to be the focus of my
25 presentation this morning. The focus is going to be

1 presenting just enough of that information so that it
2 lays a context for the real questions that we have for
3 you, questions that we need to have answers to before
4 we go too far into the analysis.

5 So -- okay.

6 (Slide)

7 MR. KENDALL: The first slide shows what you
8 see in the flow chart that was over there, the things
9 that the market and technology assessment feeds into.
10 That's the screening analysis Jim McMahon will talk
11 about next, national energy savings analysis, which
12 requires projections of shipments of the different
13 equipment, and the manufacturer impact analysis, which
14 we'll also talk about later.

15 Some of the pieces of information that come
16 out of the market and technology assessment are shown
17 at the bottom of the chart, which are the firms and the
18 structure of the industry, characteristics of the
19 products, historical shipment data, non-regulatory
20 incentives, ways that different organizations stimulate
21 the sales of higher-efficiency equipment, and regional
22 differences in installation or shipments or product
23 styles.

24 (Slide)

25 MR. KENDALL: Okay. The second slide lists

1 some of the data sources that we're aware of right now
2 and that we've used in putting together the basic
3 information that we already have. I won't read through
4 those. I'll let you look at them.

5 And the main question on this page is the top
6 -- well, I guess two main questions. The top question
7 is, should the Department consider additional sources?
8 In other words, if you're aware of good sources about
9 the market, the products in the market, the designs of
10 those products, the cost, the price of those products,
11 please let the Department know if they're not currently
12 on this list. If there are some on this list that you
13 think are preferred or some that are maybe obsolete,
14 let us know that, too.

15 The second question is, are the stakeholders,
16 which is all of you, willing to provide more detailed
17 information than what appears in these sources? You'll
18 notice, for example, that census data is typically very
19 highly aggregated, may give quantity shift, value
20 shift. More useful for this analysis is value per
21 input -- per type of product by input rating, you know,
22 to -- to a great level of this aggregation.

23 As we go on through the morning there will be
24 a lot of these things. You'll begin to form a picture
25 of the type of information that's useful for the

1 analysis. And keep in the back of your mind that if
2 you have or if you're aware of information along those
3 lines please let the Department know.

4 MR. BROOKMAN: I see Jim's got a comment.
5 Into the mike, Jim.

6 MR. CRAWFORD: Jim -- Jim Crawford. Very
7 quick question. Could you enlighten us on what that
8 first item is, Mark?

9 MR. KENDALL: The first item, the BTS Core
10 Databook? Is that what you're talking about?

11 MR. CRAWFORD: Yes.

12 MR. KENDALL: Okay. That's -- that's a
13 compilation of information that the Building Technology
14 -- I don't even know what that stands for.

15 MR. BROOKMAN: State and Community Programs.

16 MR. KENDALL: -- State and Community Programs
17 Office within DOE puts together for their own purposes.
18 It's also available on their Web site. And it's a lot
19 of information on building energy use, building
20 equipment gathered from various sources.

21 MR. CRAWFORD: Thank you.

22 MR. KENDALL: There's -- I don't believe
23 there's any original primary data in there so it really
24 does consist of a lot of the information that's below
25 it. Thanks for that question.

1 MR. BROOKMAN: Frank Stanonik?

2 MR. STANONIK: Frank Stanonik with GAMA.

3 MR. BROOKMAN: Frank, you've got to use the
4 mike, please.

5 MR. STANONIK: You think so, huh?

6 (Pause)

7 MR. STANONIK: In the same vein, I'm not
8 familiar with BSRIA. What is that?

9 MR. KENDALL: Okay. That's -- now, I know I
10 don't know what that stands for.

11 (Laughter)

12 MR. KENDALL: But that's -- that's a private
13 firm that produces market reports, market assessments.
14 And this report is for sale. They've allowed us to
15 excerpt from it and some of that data is included in
16 the packet on the table. So, this is -- they talk
17 about market trends and the typical thing you see in a
18 -- in a market assessment, some information about
19 different product types, prices of products on the
20 market, things like that. It's still pretty high level
21 and it's starting to get a little -- a little outdated
22 at this point, but it's one of the few sources where
23 you can get price information, for example.

24 MR. BROOKMAN: So, let's see right now if
25 there are other additional sources that others would

1 suggest?

2 MR. KENDALL: I believe in that presentation
3 in the back we do spell out BSRIA and where you can get
4 that.

5 MR. BROOKMAN: Okay.

6 MR. KENDALL: And we'll see if we can put
7 that information on the web so it's available to
8 everybody.

9 MR. BROOKMAN: And your second question,
10 Mark. Are the stakeholders willing to provide more
11 detailed information? Say what your idea or
12 expectation might be about that detailed information.

13 MR. KENDALL: Well, as I said, as we go
14 through the explanations of the analyses this morning
15 they'll begin to understand what type of information
16 will be useful for the analysis.

17 MR. BROOKMAN: Okay.

18 MR. KENDALL: So, I can't really answer that
19 question without going through the rest of the
20 presentations.

21 MR. BROOKMAN: Okay.

22 MR. KENDALL: I hope the answer to the
23 question is "yes," and then specifically you can judge.

24 MR. BROOKMAN: Yes?

25 MR. SACHS: Harvey Sachs, American Council

1 for Energy Efficient Economy.

2 The one data source that I don't see here
3 which has historical value and may have predictive
4 value is the CPI PPI Data Series, Consumer Price and
5 Producer Price Index Data Series, which are
6 desegregated and which do give normative data as nearly
7 as possible feature-independent for many classes of
8 appliances related to these. I haven't checked whether
9 these are in it.

10 MR. KENDALL: Okay. Thank you.

11 (Slide)

12 MR. KENDALL: All right. Slide #3. These
13 are getting into now some of the questions that we'd
14 like you to answer. We can either have a discussion
15 about them now or you can just wait until your written
16 comments but, please, if you have an opinion on these
17 let -- let the Department know.

18 The first question is, since this is the
19 furnace and boiler market there are regional
20 differences across the country, colder climates, warmer
21 climates, different installation practices that could
22 be an important aspect of the analysis. So, the first
23 question is, should the Department consider regional
24 differences in product distribution or use, and if so,
25 which ones?

1 The Department sets a national standard
2 applying to all products sold in the country, and, you
3 know, at the extremes they could evaluate, say, life
4 cycle cost, for example, at the zip code level. I
5 don't want to make any promises. I'm looking at Jim
6 and he's --

7 (Laughter)

8 MR. KENDALL: So, this is one of the things
9 that we'll have to make a decision on, how finely do we
10 look at the analysis. I think for air conditioners we
11 looked at census -- census regions, is that correct?

12 MR. McMAHON: For air conditioners we looked
13 at census divisions in a few large states, a total of
14 13 regions.

15 MR. BROOKMAN: That was Jim McMahon.

16 MR. McMAHON: I'm sorry. Jim McMahon.

17 MR. BROOKMAN: Say it again. A total of how
18 many?

19 MR. McMAHON: A total of 13 regions. They
20 were mostly census divisions plus four larger states.
21 I don't think the data exists to quite do it at the zip
22 code level.

23 MR. BROOKMAN: So, those 13 regions, how does
24 that stratify? I mean how does it show itself on a
25 map?

1 MR. McMAHON: The nine census divisions are
2 collections of states and then we divided some of those
3 -- for example, I'm from California. The -- the region
4 number nine includes California, Oregon, Washington.
5 California was separated out because it's a large block
6 and has -- properties.

7 MR. BROOKMAN: So that was the air
8 conditioner analysis. Something like that might be
9 possible in this case?

10 MR. McMAHON: Right.

11 MR. KENDALL: Okay. Okay. I see Harvey.

12 MR. SACHS: Harvey Sachs, ACEEE.

13 Toward what goal would the Department
14 consider regional differences?

15 MR. KENDALL: Well, from an out -- analytic
16 perspective, it allows you to see on the map of the
17 nation which consumers in which parts of the country
18 are likely to be more favored by a particular standard.
19 You know, that provides insights for policy-makers as
20 well as the Department on -- on benefits and impacts.

21 MR. SACHS: I appreciate that. I'm asking
22 for a much more specific response, perhaps from DOE, on
23 the ends toward which that regional information would
24 be used. Would it be used for ends other than analysis
25 toward a single standard?

1 MR. KENDALL: That is an appropriate question
2 for DOE. I --

3 MR. NASSERI: Cyrus Nasser.

4 I think, Harvey, we -- we would like you to
5 -- to comment on that written comments period and
6 we'll, you know, get back to you or -- comments in a
7 more -- detailed manner.

8 MR. BROOKMAN: Frank Stanonik?

9 MR. STANONIK: Frank Stanonik with GAMA.

10 Maybe a little redundant to Harvey, but I
11 guess insofar as my -- what I understand of this to
12 this point and for looking at furnaces -- regional
13 benefit, I mean you just have to look at heating degree
14 days. I mean it's a heating appliance. Obviously,
15 where they have longer winters there's potentially more
16 benefit. To me, the only other factor that comes into
17 the mix is in those identified areas what's the
18 predominant fuel? I guess I'm trying to figure out
19 what else is there that you, you know -- I guess I
20 don't have a good sense of what else there is that
21 would be useful to this rulemaking.

22 MR. BROOKMAN: Is it Daniel? Daniel Dempsey?

23 MR. DEMPSEY: Dan Dempsey, Carrier.

24 Just to add to that, I think looking down the
25 line here to the agenda when we start talking electric

1 consumption, regional differences does come into play
2 because the regional differences has a strong impact on
3 the electrical consumption of product. There's also
4 strong differences in -- in installation practices
5 throughout the country. So, I think the Department and
6 the team needs to be aware what the differences are but
7 I don't know how that plays into formally considering
8 them.

9 MR. BROOKMAN: Jim --

10 MR. MULLEN: Yes, Jim Mullen, Lennox.

11 I just wanted to clarify that regional
12 analysis is concerned with analysis for a single
13 standard and not regional standards. Is that correct?

14 MR. KENDALL: Yes.

15 MR. BROOKMAN: Thanks for that clarification.
16 Carl Adams?

17 MR. ADAMS: Carl Adams, DOE.

18 Yes, I wanted to say that we will be looking
19 for just one national standard, but in determining the
20 impacts of that standard and we discussed, I believe,
21 later in here that we would look at different subgroups
22 of -- of population because we'll be looking at those
23 people who will -- will benefit from a standard. And
24 whenever you have a national standard there will
25 obviously be some group of people who will not benefit.

1 And we just want to see if they're all collected
2 together in one place or one type of fuel or if there's
3 some consistency to that, and then that would be taken
4 into account in setting the one national standard.

5 MR. BROOKMAN: Jim McMahon?

6 MR. McMAHON: I just wanted to respond to Mr.
7 Stanonik and Mr. Dempsey. The three things that we've
8 thought about about why you consider regions are, one,
9 that the climate which Mr. Stanonik mentioned.
10 Secondly, energy prices are -- and thirdly, building
11 construction practices in part due to building codes --

12 MR. BROOKMAN: Jim, you gotta get closer to
13 the mike.

14 MR. McMAHON: Shall I repeat --

15 MR. BROOKMAN: Please -- please do.

16 MR. McMAHON: Jim McMahon, Lawrence Berkeley
17 National Laboratory.

18 (Laughter)

19 MR. McMAHON: Responding to Mr. Stanonik and
20 Mr. Dempsey with regard to regional differences.

21 MR. BROOKMAN: Could you hear him back there?

22 AUDIENCE MEMBER: Yes.

23 AUDIENCE MEMBER: No.

24 MR. McMAHON: How about now? Is it better?
25 No? Hello, hello? Now it's on. Okay.

1 Good morning.

2 (Laughter)

3 MR. McMAHON: With regard to regional
4 differences -- my name is Jim McMahon, Lawrence
5 Berkeley National Laboratory.

6 The regional differences that we were
7 thinking about and we would like comment on are
8 threefold: climate, so heating degree days would be
9 appropriate for consideration; energy prices, which
10 vary regionally for each of the fuels; and finally,
11 building construction practices, in part due to
12 building codes vary from state to state and region to
13 region.

14 MR. BROOKMAN: Thank you. Other comments?
15 Jim Ranfone?

16 MR. RANFONE: Yeah, Jim Ranfone, AGA.

17 On this issue of regional analysis, the --
18 the Department is also required to look at fuel
19 switching. So, as I understand it, if you were to
20 establish a single AFUE value that's relatively high,
21 that would impact a region of the country because that
22 product would be less competitive with another energy
23 source. That's what you'd have to consider, so fuel
24 switching is a major issue here and regionality in this
25 kind of a product, which is impacted by the climate,

1 have to be taken into account. So, I think that's part
2 of the reason you're looking at the regions.

3 MR. BROOKMAN: Thank you. That's -- okay.
4 That's the kind of information the Department wants to
5 receive.

6 Mark Kendall, keep going.

7 MR. KENDALL: Okay. Doug's asked me to just
8 read the questions and hold the discussion until at the
9 end of my presentation. I'm not opposed to doing it
10 either way.

11 MR. BROOKMAN: It occurs to me that some of
12 these questions get illuminated by the -- by the
13 presentation which is about to follow, so.

14 MR. KENDALL: It'd also help you gauge how
15 much time we have to spend on each question where if we
16 go one-by-one we might think we have more time than we
17 do.

18 So, the second one -- I mean feel free to ask
19 me clarifying questions about what I mean here -- what
20 assumptions regarding the impact of non-regulatory
21 initiatives, Energy Star, utility rebates, should DOE
22 use in the analysis. Is that clear?

23 The third question is, are there any
24 impending changes in the traditional three-step
25 distribution chain of which the Department should be

1 aware?

2 (Slide)

3 MR. KENDALL: Okay. Page 5. I don't know
4 what happened -- oh, sorry. Page 4.

5 2. Product Classes

6 MR. KENDALL: Okay. Now we talk about
7 product classes. The EPCA gives DOE the ability to
8 establish different classes of products, so within
9 boilers there can be different types of boilers, within
10 furnaces different types of furnaces. In fact, the way
11 the law is written, boilers is a class of furnace. And
12 one of the first decisions the Department has to make
13 is how to establish those classes for the purpose of
14 the analysis, how to establish those classes for the
15 purpose of the regulations.

16 So, based on the ANOPR published in 1994, it
17 listed some product classes and those are listed here.
18 So, within gas furnaces, weatherized, non-weatherized.
19 Oil furnaces, weatherized, non-weatherized. Mobile
20 home furnaces, gas and oil. How water boilers, gas and
21 oil. Steam boilers, gas and oil. And then combination
22 space/water heating appliance, also gas and oil. So,
23 these are some things that we'd like to discuss,
24 whether these -- are appropriate, whether they can be
25 consolidated, whether more should be created.

1 There's issue around the combination
2 space/water heating appliance because DOE doesn't have
3 a test procedure adopted for that -- that product and
4 is not allowed to promulgate a standard without having
5 a test procedure.

6 So, the question along that group is, are
7 they appropriate? This is probably something we may
8 want to have a little discussion about but with --
9 maybe too detailed that we'd want to reserve that for
10 written comments during the comment period.

11 The second question is, could some classes be
12 consolidated not for regulatory purposes but for
13 analytical purposes? Basically, when we have separate
14 classes that we have to analyze we need to decide what
15 degree of analysis will apply to each class, and the
16 more classes there are, the messier the analysis gets,
17 the more difficult it is to -- to undertake and
18 understand. So, there are times where we may have a
19 product class that has a low volume of shipments that
20 we'd like to combine with another class simply for the
21 purpose of the analysis and then break it out at the
22 end of the analysis with possibly a different standard
23 level based on some rule that we've all agreed to up
24 front.

25 So, I gave a couple -- I gave an example

1 there. There could be other types of examples.

2 MR. BROOKMAN: So, let's see if we have any
3 comments on these two --

4 MR. KENDALL: Okay.

5 MR. BROOKMAN: -- on page 4.

6 MR. KENDALL: So, discussion around product
7 classes.

8 MR. BROOKMAN: Yes? Jim and then to Jim --
9 pardon me. John.

10 MR. MARRAN: John Marran from Energy
11 Kinetics.

12 I've pre-addressed these comments to Cyrus so
13 it's going to be very brief, but in the '84 - '85 --

14 MR. BROOKMAN: Let me just -- for everybody
15 in the room, these are rather antiquated microphones.
16 You need to get real close to them.

17 MR. MARRAN: In the '84 - '85 public workshop
18 --

19 MR. BROOKMAN: Is it on?

20 MR. MARRAN: -- on the subject of AFUE the
21 Department realized that combination appliances were
22 becoming more popular and becoming more effective, and
23 at the time I introduced combination appliances which
24 saved 39 percent fuel compared to other units. I
25 believe that there's a need for a test procedure for

1 combination appliances, and at this point I'd just like
2 to say that there is a need for that because they're
3 becoming more and more popular and there are various
4 designs, et cetera, of those and I think a very strong
5 need for that product.

6 MR. BROOKMAN: Thank you. Jim Ranfone?

7 MR. RANFONE: Just -- when you're talking --
8 Jim Ranfone, American Gas Association.

9 On the product classes and the
10 appropriateness, later on you're going to be talking
11 about electrical consumption and possibly establishing
12 some kind of a maximum kilowatt-hour annual usage. If
13 you go that route I think you really need to consider
14 electric furnaces as a product class for both stick-
15 built and manufactured homes because if you're looking
16 at reducing energy consumption and electrical
17 consumption, there's no reason why that product class
18 shouldn't be considered in terms of reducing electrical
19 consumption, particularly in the motors.

20 MR. BROOKMAN: Thank you. Other comments on
21 these questions? Joe Mattingly, and then to Jim.

22 MR. MATTINGLY: Joe Mattingly from GAMA.

23 This may seem a little off the point but we
24 did have -- we were talking about mobile home furnaces
25 here and it seems like the framework document asked

1 some questions that I don't see asked here in -- in
2 these material. I wanted to be sure I didn't skip it.
3 And I know there's a question in the framework document
4 about the mobile home furnace schedule for standards.

5 And first of all, we agree that it ought to
6 be called "manufactured home furnaces" and not "mobile
7 home furnaces." But there's also the question in the
8 framework document about whether there should be --
9 just waive this extra review for mobile home furnaces.
10 I -- I don't see the question asked in any of these
11 portrayals. I don't want to overlook it. And we would
12 state that we believe that the -- you should waive that
13 and just go ahead and have the same schedule now for
14 all furnaces, including manufactured home furnaces,
15 same effective date.

16 MR. BROOKMAN: Okay. So that'll be in your
17 written comments, I presume.

18 Jim Crawford?

19 MR. CRAWFORD: Jim Crawford, Trane Company.

20 With respect to the question of the
21 combination of classes for analytical purposes, I think
22 that that is a -- a question which only the analysts
23 can answer and only their customer can answer. Without
24 knowing the details of the analysis in advance it's
25 impossible for any of us to say yes, that's going to

1 give a valid response or it isn't. So, you don't get
2 off the hook.

3 MR. BROOKMAN: Thank you.

4 MR. KENDALL: Okay. I'll move on to the next
5 topic.

6 3. Baseline Residential Furnaces and Boilers

7 (Slide)

8 MR. KENDALL: Okay. Within each product
9 class we have to identify product class as far as
10 analytics go. Have to identify baseline model that
11 will be used as the basis for determining the cost of
12 increasing efficiency in -- in that product.

13 So, here we have the different features that
14 we look to include in the baseline model. Maybe
15 capacity input rating, configuration, efficiency, and
16 features. The second point is that it's usually based
17 on the most commonly sold minimum efficiency product in
18 each product class. And the third point is that, what
19 I just explained, serves as the basis for cost and
20 performance estimates that are intended to represent
21 the typical product.

22 (Slide)

23 MR. KENDALL: The next slide gives a little
24 more detail of that so you have a better understanding
25 of what I'm talking about.

1 (Pause)

2 MR. KENDALL: Okay. We asked GAMA prior to
3 this meeting for some input on some of these things.
4 On the furnace side they gave some suggestions for what
5 the baseline input rating should be, so for gas and oil
6 you see the two factors there. As far as
7 configuration, we've got up-flow furnace, 78 percent
8 AFUE, which is the minimum recommended -- minimum
9 allowed by standards, induced draft, electronic
10 ignition. There may be other features we'd like to
11 include in that model.

12 The purpose of having these features defined
13 now is if we're analyzing more stringent efficiency
14 levels, say 79, 80 percent AFUE, we'd like to know how
15 this product changes as the efficiency level goes up,
16 so we need to know what the baseline is.

17 You see the factors for boilers also. Same
18 types of things. The only difference there is that
19 cast iron specified. There may be different
20 construction materials for boilers that have a lot
21 lower annual shipments of those products. So, this is
22 an attempt to define what a typical minimum efficiency
23 product would be in the marketplace.

24 So, the first question along that and --

25 MR. BROOKMAN: Yes. Frank Stanonik. You can

1 see the Department's at this definitional stage. This
2 is a good time to comment. Frank?

3 MR. STANONIK: Well, I can't let this one go
4 by. I'm not -- something must have got lost in the
5 translation because certainly a baseline boiler does
6 not have induced draft. They're atmospherically fired.
7 They are going to have an electromechanical bin damper.
8 And I'm -- well, my information says the baseline
9 boiler probably still has a standing pilot also, not
10 electronic ignition.

11 So, I -- I know that we -- we were able to
12 get some of the information on the furnaces a little
13 more in advance and it may be something a little
14 garbled here, but the baseline boiler is going to be
15 atmospherically fired burner, electromechanical damper,
16 and a standing pilot, based on the latest information
17 we received.

18 MR. KENDALL: Okay.

19 MR. STANONIK: The inputs are probably okay.

20 MR. KENDALL: Thanks.

21 MR. NASSERI: Cyrus Nasser, Department of
22 Energy.

23 And Frank, you're stating that that features
24 that that boiler -- that makes a minimum of 80 percent
25 AFUE?

1 MR. STANONIK: Yeah.

2 MR. NASSERI: Okay.

3 MR. BROOKMAN: Thank you. Yes, sir?

4 MR. CUI: Yeah, I agree --

5 MR. BROOKMAN: Your name, please?

6 MR. CUI: My name is Shuqing Cui. Come from
7 the Weil-MacLain.

8 MR. BROOKMAN: Pardon me. Let me -- let me
9 just check and make sure it's working. Is it on? It's
10 on. Okay.

11 (Pause)

12 MR. BROOKMAN: Okay. Everybody -- everybody
13 now look at your microphone to see whether you can tell
14 if it's on or not.

15 Okay. Let's try this.

16 (Laughter)

17 MR. BROOKMAN: Okay. Sorry to interrupt.
18 Keep going.

19 MR. CUI: My name is Shuqing Cui. Come from
20 Weil-MacLain, which is casting iron boiler
21 manufacturer.

22 We agreed with Frank that --

23 MR. BROOKMAN: I'm sorry. This is -- this is
24 --

25 MR. CUI: -- baseline --

1 MR. BROOKMAN: -- this is so difficult. I'm
2 sorry. It's good right there.

3 MR. CUI: Currently, our baseline units is an
4 -- with -- stack damper -- and --

5 (Pause)

6 MR. CUI: Currently our baseline unit is a
7 nitro draft with a stack damper and standing pilot
8 ignition and also for steam boiler. Current AFUE is 75
9 percent minimum.

10 MR. BROOKMAN: Thank you. Yes, other
11 comments on the features? New ones that may be
12 included and what's here listed.

13 Yes, sir? Your name, please?

14 MR. ROCKY: Good morning. Bryan Rocky from
15 York.

16 Relative to the electrical characteristics
17 that are going to be discussed, I think the furnace
18 definitely needs to have a consideration of air flow
19 tonnage of -- you know, used for air conditioning as
20 one of the major characteristics.

21 MR. BROOKMAN: Thank you.

22 MR. KENDALL: Thanks. Do you have a
23 suggestion for what that might be?

24 MR. ROCKY: Well, based on a typical 75,000
25 input, probably a three-ton blower system is most

1 appropriate.

2 MR. BROOKMAN: Thank you. Other comments on
3 the features listed here for furnaces and boilers?

4 Yes. Jim Crawford and then --

5 MR. CRAWFORD: Jim Crawford, Trane.

6 This really comes back to the point I made a
7 moment ago about combining things. In the furnace you
8 are going to need, I think, to look at both clamshell
9 and tube-type heat exchangers somewhere in your
10 analysis. Now, certainly, we shouldn't have different
11 standards for the two, but you're going to need to look
12 at 'em when you start looking at cost to manufacture
13 and what have you.

14 MR. KENDALL: Thanks.

15 MR. BROOKMAN: Thanks. Your name, please?

16 MR. LYNCH: Greg Lynch with Amana.

17 Following up on Bryan Rocky's comment as far
18 as electrical consumption and air flow and tonnage, as
19 you look at not only the cost of the equipment but the
20 electrical consumption for a given type or class of
21 equipment, I think it's -- it's important for DOE to
22 recognize there are regional requirements for high air
23 flow and low Btu input where it may be desirable to
24 look at the gas side efficiency or the AFUE efficiency
25 as one part of the equation and the electrical

1 consumption somewhat separately because manufacturers
2 do and the marketplace requires a different matching of
3 Btu input and air flow tonnage. When we're talking
4 about southwest market we have high air flow for high
5 air conditioning requirements and the blowers are
6 typically optimized for that, you have low Btu inputs.

7 MR. KENDALL: Thanks.

8 MR. LYNCH: Just the reverse is true in the
9 northern tier.

10 MR. KENDALL: Right.

11 MR. BROOKMAN: Yes?

12 MR. DEMPSEY: Dan Dempsey, Carrier.

13 I have more of a question than a comment and
14 it pertains to the baseline on electrical consumption.
15 How will the baseline for electrical consumption be
16 established in which --

17 MR. KENDALL: Okay.

18 MR. DEMPSEY: -- one can improve upon?

19 MR. KENDALL: This is probably a more
20 appropriate question for later on in the morning when
21 we talk about electrical consumption. Don't let us
22 forget to answer that question.

23 MR. BROOKMAN: Yes. Harvey?

24 MR. SACHS: Harvey Sachs again.

25 I just want to be on record that we will have

1 some ideas on ways to handle this air flow issue and
2 that the important point the gentlemen have made is
3 that there are existing regional differences in air
4 flow which will complicate the challenge in defining
5 the baseline model if we are to consider electrical
6 consumption.

7 MR. KENDALL: Okay. Thanks.

8 MR. BROOKMAN: Thank you. Other comments on
9 those four questions you see on Slide 6?

10 MR. KENDALL: Let me explain some of those
11 questions.

12 MR. BROOKMAN: Go ahead.

13 MR. KENDALL: The -- the first one is pretty
14 clear.

15 The second one is multiple baseline units
16 needed within a class. Might not be necessary for this
17 product, but if you know that there is a wide range of
18 products in a class it's possible to define more than
19 one baseline unit and assign market shares or something
20 to weight one unit versus another. That's not
21 something that we prefer to do because, again, it -- it
22 has the analytical effect of having multiple classes,
23 but if there's a really compelling need to establish
24 more than one baseline unit we -- we can do that.

25 This third question is, again, analytically

1 might be possible to analyze some classes and extend
2 those results to other classes or other products within
3 a class. That's similar to the question I asked on the
4 previous slide.

5 The last one is -- the last one's very
6 important. This -- since the standard is based on --
7 okay. The -- in the boxes above we've got defined
8 input ratings. As the product becomes more efficient,
9 to keep the input rating constant the output will go
10 up. So, the question analytically is should we then
11 keep the input rating constant under all -- all
12 efficiency levels? Should we lower the input rating to
13 keep the output value constant? Or should we do
14 something else that we haven't thought about? And
15 there might actually be another option that we did
16 thought -- think about that's in this question.

17 So, that's one that we definitely want to
18 hear about in your written comments and maybe entertain
19 some discussion on that now.

20 MR. BROOKMAN: Frank Stanonik?

21 MR. STANONIK: Frank Stanonik with GAMA.

22 Two quick things. First of all, I just want
23 to advise Cyrus that, obviously, manufactured homes are
24 right now a separate product class and we'll get you
25 some information in our written comments as far as a

1 baseline. It is a different baseline than a regular
2 furnace.

3 But on your last point here, I guess the
4 thing I wonder is certainly the -- one of the let's say
5 more immediate effects we saw when we first dealt with
6 efficiency -- efficiency regulations for furnaces was
7 in fact a movement towards smaller appliances in terms
8 of input. It's happened both with boilers and
9 furnaces. I guess if there were some way to get some
10 idea of what is happening in terms of new homes and
11 what the average square footage of new homes is or what
12 the heating load or something like that, that could
13 possibly be -- possibly be correlated with what's
14 happening to the products themselves.

15 I'd be inclined historically to say that --
16 that, yes, you should assume a lower input because the
17 output would be the same. But that's pretty old
18 history and the truth is I don't know if that really
19 would fit today or not. But I think it is something
20 you really to the best you can need to try to figure
21 out.

22 MR. KENDALL: Okay.

23 MR. STANONIK: Because the -- the only
24 historical information we have is that efficiency
25 pushes product size down. Will that continue? I don't

1 know.

2 MR. BROOKMAN: Bill Prindle?

3 MR. PRINDLE: Bill Prindle, Alliance to Save
4 Energy.

5 I -- I tend to agree with Frank on that that
6 equipment like this has to be sized to serve the actual
7 thermal load of the building. And thermal load of the
8 building is determined by a lot of factors, including
9 envelope design, which is affected by building codes or
10 voluntary programs. So, I think the Department is
11 going to have to make some projections as to where
12 thermal envelope efficiency and other internal heat
13 gains and other factors are going to be at the time the
14 standard becomes effective because, you know, what a
15 designer cares about is the load that's going to have
16 to be served and that has to do with output of the
17 appliance, so -- and I think the trend is towards
18 smaller appliance, so by all means, let's make some
19 forward-looking assumptions about where envelope
20 efficiency's going to be.

21 MR. KENDALL: Just to make clear this
22 connection of why we care and why this is an important
23 issue. If we assume that the input rating goes down
24 over time, for example, then that will mean that the
25 production cost would follow accordingly, and that

1 impacts the -- the analysis.

2 MR. PRINDLE: And just --

3 MR. KENDALL: The energy consumption also,
4 you know, will change over time. So, this is all tied
5 to eventually calculating life cycle costs. Okay.

6 MR. PRINDLE: Bill Prindle. Just as a
7 follow-on, given that internal heat gains also affect
8 this, you know, we need to make some assumptions about
9 changes in internal heat gains, which are partly
10 determined by some of the other standards that DOE's
11 working on and other plug loads and so forth.

12 MR. KENDALL: Thank you.

13 MR. BROOKMAN: Other comments on these
14 questions?

15 (No response)

16 MR. KENDALL: Okay.

17 MR. BROOKMAN: Okay. We're going to keep
18 moving this along. We've got a lot to cover here
19 today, so, Mark, keep going.

20 (Slide)

21 MR. KENDALL: All right. Slide 7 shows some
22 GAMA data. And GAMA did not provide this for us. We
23 did our own query, so if there's something wrong don't
24 blame it on GAMA, blame it on us. Well, don't blame it
25 on anyone.

1 (Laughter)

2 MR. KENDALL: Point it out and we'll fix it
3 next time. Cyrus says definitely don't blame it on the
4 Department.

5 Okay. The -- if we query the GAMA database
6 for residential furnaces and boilers, these are the
7 histograms that we get. The obvious question -- and we
8 have some ideas what the answers might be, but we'd
9 like to hear what your impressions are. The obvious
10 question is why do furnaces -- residential furnaces
11 stop at 150,000 Btu input while residential boilers go
12 all the way up to the 300,000 level? And the second
13 question we don't even need to ask because we just
14 talked about it, so this is the question for this
15 chart. If you have any ideas now, we'd be happy to
16 hear them. Otherwise, we'd be interested to see what
17 you have in your written comments.

18 MR. BROOKMAN: Yes, Jim?

19 MR. CRAWFORD: Jim Crawford. Knowing nothing
20 about the subject, I'll speak with authority.

21 It strikes me that boilers, from my
22 experience, are used in a very different part of the
23 country than are forced-air furnaces. Boilers
24 typically are the older central cities of the north. I
25 think the last boiler installed in a residence in Texas

1 was about 1902, so.

2 And while I've got the microphone for just a
3 moment, we need to be careful on the question we were
4 addressing just a moment ago that we don't fool
5 ourselves about sizing. Houses -- new construction
6 houses are getting bigger. And your databases that
7 you've cited, like -- like the '97 -- will show that
8 conclusively.

9 MR. BROOKMAN: Thank you. Dan?

10 MR. DEMPSEY: Dan Dempsey at Carrier.

11 I just want to add to Jim's comment that the
12 reduction in size on furnaces may be tied to
13 demographics in terms of the growth in the south and
14 the west more so than to smaller homes.

15 MR. KENDALL: Okay. Thank you.

16 MR. BROOKMAN: Please say your name for the
17 record.

18 MR. STANGER: Harvey Stanger, Monitor
19 Products, Incorporated.

20 This is a little different twist on
21 categories and I thought I'd just mention it so you
22 could think about it. I think about 70 to 90 percent
23 of the products sold are replacement and 20 to 10
24 percent are residential new construction. Perhaps you
25 may want to look at the categories that way.

1 MR. BROOKMAN: Thank you.

2 MR. KENDALL: The Department of Energy --

3 MR. STANGER: One other thing. The
4 residential new construction fall under new energy
5 requirements for energy efficiency for the homes.

6 MR. BROOKMAN: Yes.

7 MR. KENDALL: Thanks. To clarify the
8 Department's role, the DOE establishes minimum
9 efficiency levels for product at the point of
10 manufacture. They have some influence over building
11 codes which apply to installation of products, but it's
12 very difficult for the Department to differentiate a
13 product when it leaves the plant based on whether it's
14 going to be installed as replacement or as new homes.
15 There -- at times there may be product characteristics
16 that will allow them to do that and if you're aware of
17 any such characteristics that can allow the Department
18 to differentiate between markets, please let them know.

19 MR. BROOKMAN: Jim?

20 MR. MULLEN: Jim Mullen, Lennox.

21 Mark, a question on your furnace graph up
22 there. I would have thought that 75 and 100,000 would
23 have been the highest hits but the bars seem to be too
24 close together. Is there a reason for that?

25 MR. KENDALL: You're talking about the two

1 peaks on the --

2 MR. MULLEN: Yeah.

3 MR. KENDALL: -- furnace graph?

4 MR. MULLEN: Yes.

5 MR. KENDALL: I don't know -- I don't know
6 what that is. We have -- if we have any insights on
7 that, we would get back with you.

8 MR. BROOKMAN: Yeah. The question, I think,
9 is still on the table of why is this the way it is.

10 Frank?

11 MR. STANONIK: Well, first let me clarify.
12 You just-- you basically looked at listings. This --
13 this is not shipments by capacity.

14 MR. KENDALL: No, no. This isn't shipments.

15 MR. STANONIK: This is number of models
16 available.

17 MR. KENDALL: Models in the catalogue.

18 MR. MULLEN: Okay.

19 MR. STANONIK: All right. So --

20 MR. KENDALL: In the database.

21 MR. STANONIK: -- shipment data would, I
22 think, look a little bit different.

23 MR. KENDALL: Yeah.

24 MR. MULLEN: Right.

25 MR. STANONIK: I think you've heard some of

1 the answers as to why this is so -- certainly, one of
2 the major ones is that the boiler market is certainly
3 concentrated in the northeast part of the U.S. It is
4 a very large replacement market and so they typically
5 replace an old boiler that was very relatively large
6 with a similar precise product. And the other factor
7 that certainly influences this is that in many of those
8 homes when they installed that boiler they also added a
9 auxiliary water heater and so in fact the -- the
10 heating device itself is not only heating the building,
11 it's providing hot water for the building, which would
12 require some of the other additional input.

13 Another perhaps explanation is -- I mean one
14 could look at that and say, well, why aren't there any
15 furnaces with higher inputs, as was mentioned?
16 Clearly, there's a lot of big homes being built around
17 -- at least around here there are. I think what you
18 see nowadays in those cases is the fact they put two
19 furnaces in. They put multiple appliances in so they
20 can zone the building or whatever. And that -- you
21 know, whichever drove -- what drove what I don't know,
22 but basically, that has allowed the -- the general size
23 of furnaces to move down and still provide the heating
24 load for the larger homes and the cooling loads.

25 In the case of the boilers, the market just

1 kind of stayed with the idea, well, if you need a
2 bigger appliance, I got one. You don't need two, I got
3 one.

4 MR. BROOKMAN: Thanks, Frank.

5 MR. CRAWFORD: Jim Crawford. Just a quick
6 comment on the -- the split between the replacement and
7 new construction. I think if you look at housing as
8 far as furnace sales and you will come to the
9 conclusion reasonably quickly that the marketshare for
10 replacement is not as high as was stated just a few
11 minutes ago. I would guess it's probably more in the
12 -- in the 50 percent region, give -- give or take.

13 MR. BROOKMAN: Maybe there's some regional
14 variation on that as well.

15 Other comments on -- on this issue? I think
16 -- otherwise, I think we'll move on.

17 Yes? Michael Martin?

18 MR. MARTIN: This is a question rather than a
19 comment. I've always been mystified as to why when
20 we're looking at these classes we go up to 300,000 for
21 furnaces --

22 AUDIENCE MEMBER: Boilers.

23 MR. MARTIN: -- boilers and 225,000 for
24 boilers as the limit between residential and commercial
25 equipment. And is this one of the things that you're

1 looking at, whether you might change the scope?

2 MR. BROOKMAN: You think there's an implicit
3 break point here that -- that -- is that what you're
4 suggesting?

5 MR. MARTIN: Well, there is -- there has been
6 traditionally a different break point between
7 residential and commercial for furnaces --

8 MR. BROOKMAN: And that break point again,
9 Michael, is what?

10 MR. MARTIN: 300,000 Btu per hour for boilers
11 and 225,000 Btu per hour for furnaces.

12 MR. BROOKMAN: Okay.

13 MR. NASSERI: Cyrus Nasser. This is,
14 Michael, basically the definition of the NAECA for
15 these products. NAECA defines the residential or
16 household furnace as being 225,000 Btu and less and
17 boilers being 300,000. That's -- that's basically
18 stated by the NAECA.

19 MR. MARTIN: So you're not considering any
20 change in -- possible change in that?

21 MR. NASSERI: Well, unless there is a -- is a
22 reason for that --

23 MR. MARTIN: Yeah.

24 MR. NASSERI: -- obviously, but the size of
25 the limitation between residential or household and

1 commercial is something that legislation established
2 and --

3 MR. KENDALL: From an analytical perspective,
4 if there is a fraction of boilers, for example, that
5 are below 300,000 Btus that are used in commercial
6 applications and have a different duty cycle, for
7 example, we'd like to be aware of that. In prior
8 analyses -- in other rulemakings we've considered that
9 in the analysis, so that's going to be a question that
10 we'd rather answer now than later after we've already
11 done all the analysis and then have to go back.

12 MR. NASSERI: And one more thing you have to
13 bear in mind, that this requirement of the size
14 limitation by NAECA also has the one -- single phase
15 equipment. So, obviously, if there is a three phase
16 equipment which is normally or traditionally used in
17 the commercial, then that -- that falls under that --
18 that category.

19 MR. BROOKMAN: Mark, I want you to repeat the
20 last question that you -- you just said again so that
21 we get their comment.

22 MR. KENDALL: I don't recall what that was.

23 (Laughter)

24 MR. KENDALL: I thought I answered a
25 question. Did I ask a question?

1 MR. SACHS: I believe the question was
2 whether -- residential equipment is used in the
3 commercial sector.

4 This is Harvey Sachs.

5 If I recall the tables from the core
6 databook, the median commercial building is 50,000 --
7 is 5000 square feet, very large -- actually, very small
8 buildings. Not by square footage but by total numbers.

9 MR. KENDALL: Mm-hmm.

10 MR. SACHS: And anyone who assumes that those
11 are not using residential equipment at a smaller size
12 is -- probably has been smoking something I'd like.

13 MR. KENDALL: Okay. I mean the Department's
14 always interested in -- in getting data to support any
15 of these numbers, so if you have -- I remember the -- I
16 remember now phrasing it in the form of a question. If
17 you have information that can illuminate these types of
18 things, if you know of product features, for example,
19 that differentiate residential boilers from commercial
20 boilers that could help us differentiate the market,
21 let us know.

22 MR. BROOKMAN: Michael, did you have a --

23 MR. MARTIN: Yes. I agree with Cyrus about
24 the definition being in the legislation. But I read
25 that as a definition as to what is covered by the

1 standard which we are looking at revising. And I don't
2 read it as meaning that we are limited to having to
3 stick with those when we come up with a new standard.

4 MR. BROOKMAN: Okay.

5 MR. MARTIN: Somebody also mentioned the
6 three phase electrics, and those are a big mistake
7 somewhere in the -- the definition for commercial and
8 the definition for residential, and that's neither one
9 nor the other. And I think you ought to consider
10 whether you would include these in the standard here.

11 MR. KENDALL: Thanks.

12 MR. BROOKMAN: Yes, sir?

13 MR. STANGER: Harvey Stanger, Monitor
14 Products again.

15 The state of Pennsylvania classifies
16 residential as four or less apartments. State of
17 Wisconsin I think is the same. Might be five or less.
18 But -- and above that they classify as commercial. So,
19 that's what the states do --

20 MR. KENDALL: Okay.

21 MR. STANGER: -- as far as I know.

22 MR. KENDALL: Thank you.

23 MR. BROOKMAN: Thank you. Yes, sir?

24 MR. LYNCH: Greg Lynch with Amana.

25 Mark, as far as the bar chart on -- on this

1 page and the next, are those -- I know you got them out
2 of the GAMA database. Are those model listings --

3 MR. KENDALL: Yes.

4 MR. LYNCH: -- or are they shipments of a
5 given size?

6 MR. KENDALL: No, those -- to be very clear
7 --

8 MR. LYNCH: Those are model listings?

9 MR. KENDALL: -- those are model listings,
10 which is one of the limitations we have at this point.
11 We have to use publicly available data. We don't have
12 to rely on that for the whole rulemaking but right now
13 what we've relied on is publicly available. We don't
14 have this aggregated shipments data.

15 MR. LYNCH: I think you would find them to be
16 two different distributions --

17 MR. KENDALL: Okay.

18 MR. LYNCH: -- significantly.

19 MR. BROOKMAN: Jim, you want to -- do you
20 want to come up here and -- Jim Lutz.

21 MR. LUTZ: Jim -- Jim "Loots" but I do
22 respond to Jim "Lutz."

23 (Laughter)

24 MR. LUTZ: Lawrence Berkeley National
25 Laboratory.

1 A question on that is do you know or can you
2 recommend data sources where we can get shipments data
3 by year, by size, we get -- and by efficiency levels so
4 that we know historically what's been going on?

5 MR. BROOKMAN: I note you're -- he's looking
6 at Frank Stanonik.

7 MR. STANONIK: Well, the -- Frank Stanonik
8 with GAMA. The data by -- if we're looking just at
9 efficiency levels, I mean we've been providing annual
10 reports on shipments by efficiency categories, not by,
11 you know, one percent increments, the -- the basic 78,
12 80, or 80 to 88 or whatever it is, and then basically a
13 condensing product. We've been doing that for the last
14 -- probably going on the last 15, 20 years now.

15 As far as the other information, we will
16 certainly consult with our members and determine what
17 they're -- what they're willing to provide.

18 MR. BROOKMAN: Thank you.

19 MR. STANONIK: Or collect.

20 MR. BROOKMAN: Thank you. Jim Crawford and
21 then to Jim Mullen.

22 MR. CRAWFORD: Jim Crawford. The comment a
23 moment ago by my colleague from Monitor had a secondary
24 unstated message there. You just heard from him why
25 boilers are used in larger sizes residentially. Multi-

1 family, you can use a boiler most places you could not
2 use a forced-air system share -- serving multiple
3 units.

4 MR. BROOKMAN: Thank you. Jim Mullen?

5 MR. MULLEN: Jim Mullen, Lennox.

6 It occurs to me that in the air conditioning
7 rulemaking there was a percentage of commercial
8 installations put into the operating cost base?

9 MR. KENDALL: Yes.

10 MR. MULLEN: Is it the intent to do that here
11 also?

12 MR. KENDALL: If it's appropriate.

13 MR. BROOKMAN: Okay. So, additional written
14 comments on this subject I'm sure would be welcomed by
15 the Department.

16 MR. KENDALL: Okay. The -- the next slide, I
17 believe, is my final one and then I'll turn it over to
18 Jim.

19 (Slide)

20 MR. KENDALL: This one is another distortion
21 because it's based on available models. It also has
22 LPG on top of natural gas.

23 But the question on this page is that the
24 minimum standard for furnaces is 78 AFUE. The
25 available models in the market, even if you take out

1 the distortion, clearly show that there's a
2 concentration at 80. In my earlier discussion about
3 baseline models we said that it's appropriate to
4 establish the baseline at the minimum efficiency but we
5 need to be aware of what the differences are that would
6 cause the market to move from 78 to 80 because when
7 we're assessing what the cost of improving efficiency
8 is we -- you know, it's difficult to explain how if an
9 80 AFUE is more expensive than a 70 we have to be able
10 to explain why the I assume sales but definitely model
11 availability is larger. So, that's a question that
12 we'd like your input on, those two questions.

13 MR. BROOKMAN: Dan?

14 MR. DEMPSEY: Dan Dempsey, Carrier.

15 There's a few reasons behind that. If you go
16 back to before the isolated combustion system procedure
17 was in effect, the baseline model was an 80 percent
18 AFUE unit. But when ICS took effect, all the 80s
19 became 78, 79s and the market pretty much demanded 80.
20 So, the products were designed to meet the 80 level.
21 That's kind of the -- you know, a -- emotional
22 threshold in the marketplace.

23 In terms of the 78s, there are some unique
24 products in the industry that are designed for 78
25 because the lower efficiency provides for more reliable

1 venting into exterior masonry chimneys, which is a big
2 issue in the northeast and upper midwest.

3 MR. KENDALL: Okay.

4 MR. DEMPSEY: Lastly, some of the 81 to 82
5 percent products may be weatherized products in which
6 you don't have to be concerned with vent system
7 corrosion and condensation.

8 MR. KENDALL: Okay. Thank you.

9 MR. BROOKMAN: Thank you. Other comments on
10 those two questions that you see there on the bottom of
11 8? Yes, sir?

12 MR. ROCKY: Yeah, Bryan Rocky from York.

13 One of the other things, adding on to what
14 Dan Dempsey said, is in the process of rating products
15 by a manufacturer in some cases to lessen the amount of
16 testing and developing required products that would
17 actually be in the 81, maybe even 82 percent range
18 might have been rated at 80 percent to maintain the
19 consistency in a family approach, to lessen testing
20 requirements, and to provide a little more cushion as
21 far as the possibility of having a -- a unit tested and
22 failed under the ETL Program.

23 MR. BROOKMAN: Thank you.

24 MR. KENDALL: Thank you.

25 MR. BROOKMAN: Other comments on these

1 questions? This has been very useful, I think, from
2 the Department's perspective.

3 (No response)

4 MR. BROOKMAN: Let's press on with Jim
5 McMahon. For those of you that are getting fidgety,
6 it's -- we're going to take a break roundabout 10:45,
7 in that general range. Maybe, you know, 10, 15 more
8 minutes, so hang on.

9 (Pause)

10 MR. BROOKMAN: Jim McMahon.

11 MR. McMAHON: Microphone working?

12 4. Screening Analysis

13 (Slide)

14 MR. McMAHON: Okay. I'm Jim McMahon from
15 Lawrence Berkeley National Laboratory. I'm going to
16 present the last element of the market and technology
17 assessment, the screening analysis.

18 (Slide)

19 MR. McMAHON: The objectives of the screening
20 analysis are to identify technologies for detailed
21 evaluation. That is, we start with a global
22 representation of the technologies currently available
23 or expected to be available in the next few years. The
24 screening analysis then reduces that list to those that
25 are worth considering in detail. The objectives,

1 second bullet, is to focus on technologies that are
2 reasonable to employ and the screened-out technologies
3 are eliminated from the standards-setting process.

4 The next page.

5 (Slide)

6 MR. McMAHON: The criteria are specified in a
7 "Federal Register" notice of 1996. There are four.
8 They are listed here, and the first is technological
9 feasibility. Traditionally, that has been defined in
10 the following manner: any technologies that are
11 currently available in commercial products or exist in
12 prototypes are considered technologically feasible.

13 The second criterion is practicability to
14 manufacturer, install, and service.

15 The third is impacts on product utility or
16 availability.

17 And the fourth is impact on health or safety.

18 So, these are the factors the Department will
19 consider in removing technology from consideration.

20 (Slide)

21 MR. McMAHON: The Department invites comment.
22 Are there specific technologies that should or should
23 not be considered for residential furnaces and boilers?
24 And you're welcome to comment briefly now or to provide
25 detailed written comments later.

1 MR. BROOKMAN: Let's here some of these now,
2 if -- if there's anything to be said now.

3 Frank Stanonik?

4 MR. STANONIK: What was this about not
5 supposing to dominate the time?

6 MR. BROOKMAN: Don't worry. This is good
7 content.

8 MR. STANONIK: We've got, certainly, a couple
9 preliminary comments. First of all, from -- from our
10 perspective, at least in the past DOE identified pulse
11 combustion as a separate option from condensing flue
12 gases. We think practically you ought to just look at
13 condensing flue gases -- flue gases as design options.
14 Just don't see the need to separately identify pulse
15 combustion. It's just another way to get there.

16 Also, there's a number of the design options
17 which really only have applicability to some subset of
18 -- of the product classes. As an example, one of those
19 mentioned is a stack damper. And we think that it
20 would be appropriate early on to identify specifically
21 which design options fit which product classes. As an
22 example, you'd say, you know, stack dampers only
23 applicable to boiler products.

24 And in that case, we'd also like a little
25 clarity as to what you -- you mean by a stack damper.

1 The industry tends to look at vent dampers, which are
2 after the draft hood, and flue dampers, which are ahead
3 of the draft hood. And we'd ask you to just make clear
4 which one you're talking about in the -- in the design
5 option.

6 And then, in a similar vein, the design
7 option of improved or increased insulation. That,
8 obviously, only makes sense to those products that
9 you're testing to an ICS procedure. On a -- on an
10 indoor product that's tested indoors, the test
11 procedures, I would say don't worry about the jacket
12 losses as much or don't account for 'em, however you
13 want to categorize that. And so, the idea of
14 increasing the insulation is not going to have much
15 benefit in terms of the test procedures.

16 Then, the last comment is one of the design
17 options is an atomized oil burner. And again, I think
18 we need some clarity there because, at least as I look
19 at it, all oil burners atomize the oil. They've got to
20 get it into a vapor so it can burn. And so, I think,
21 you know, in -- if there's some specialized type of
22 burner that you're talking about, it needs to be better
23 defined. But that's what we have right now.

24 MR. BROOKMAN: Thank you. Cyrus?

25 MR. NASSERI: Cyrus Nasserri, Department of

1 Energy.

2 Going back to your comments on condensing
3 furnace and pulse combustion, obviously those are two
4 different principles that -- what you're saying, Frank,
5 that we should consider both of those two and one
6 design options? Is that what you meant? Was -- I
7 didn't get your --

8 MR. STANONIK: Yeah -- yeah. I'm -- I'm
9 saying that the design option, really, as -- as we look
10 at it, is creating a condensing furnace.

11 MR. NASSERI: Right.

12 MR. STANONIK: Condensing the -- the flue
13 gases.

14 MR. NASSERI: Yeah, but -- but cost -- house
15 unit furnaces has to do with how the combustion product
16 is going to be ignited. So, obviously, they're two
17 different principles.

18 MR. STANONIK: But -- but the ultimate
19 efficiency benefit is you -- you get a condensing
20 furnace that has an AFUE up in the -- the 90s.

21 MR. NASSERI: Mm-hmm.

22 MR. STANONIK: If you look -- if we're
23 looking at design options that improve efficiency and
24 so that's the ultimate measure, why would you care what
25 approach is used to get there?

1 MR. NASSERI: Because we use incremental --
2 if you go over the design option -- the efficiency cost
3 method, we use incrementals from one level going to
4 another level. So, let's say we're -- now we're going
5 to consider condensing principle, which makes it from
6 that level using that design option.

7 MR. STANONIK: Right.

8 MR. NASSERI: And next one is pulse
9 combustion, which would be if there is such a, you
10 know, efficiency improvement from the condensing using
11 the pulse combustion, that should be considered.

12 MR. BROOKMAN: Jim Crawford?

13 MR. NASSERI: I have -- I have one more --

14 MR. BROOKMAN: Yes, yes.

15 MR. NASSERI: -- one more thing with Frank.

16 MR. BROOKMAN: Mm-hmm.

17 MR. NASSERI: Considering the atomization of
18 the -- of the unit that you referred to --

19 MR. STANONIK: The atomized --

20 MR. NASSERI: Atomizing oil. This refers to
21 the latest development at Brookhaven National
22 Laboratory and this is a special burner which basically
23 uses less combustion air -- air. And then, this is --
24 you're referring, basically, to that burner, which is
25 very unique and is not a standard. And we know that,

1 you know, atomization of that isn't a standard practice
2 for any boiler, but this unique design of the less
3 combustion air is a very, very energy efficient
4 technology and we would like to consider that.
5 Brookhaven National Laboratory have all the details on
6 that.

7 MR. STANONIK: Okay.

8 MR. NASSERI: And it's also --

9 MR. STANONIK: Okay.

10 MR. NASSERI: -- installed.

11 MR. STANONIK: Okay.

12 MR. NASSERI: It's manufactured and
13 installed.

14 MR. STANONIK: All right. Well, then, you --
15 okay. That's why we're looking for more information on
16 it. Okay.

17 MR. BROOKMAN: Jim Crawford first, then to
18 John Marran.

19 MR. CRAWFORD: Jim Crawford, Trane Company.

20 I think any technology that we consider, we
21 can either stand back and ask why you're considering
22 it. Is it in fact bringing anything to the -- the
23 process? Combustion is an area that you need not spend
24 a great deal of time on. We all burn gas very, very
25 efficiently. The -- the differences in technologies

1 that are of concern are those dealing with -- heat
2 transfer, how effectively do we extract the heat from
3 the combustion products and deliver it into the water
4 or the conditioned air?

5 As a general rule also, I think that you
6 should -- should apply some kind of a market success
7 longevity measure. If you have technologies which have
8 been in the market in the past and have disappeared,
9 there are very good reasons why that is true. If you
10 have technologies that are in the market even today
11 that have never really gotten a respectable foothold in
12 the market, there are probably some very, very good
13 reasons for that as well.

14 MR. BROOKMAN: John?

15 MR. MARRAN: John Marran, Energy Kinetics.

16 I -- I really think Frank's point is
17 perfectly valid in that it's the efficiency that you
18 get out of the appliance and not the vehicles
19 necessarily that you use to get there that should be
20 the defining classification. And so, condensing --
21 once you go to condensing you have a certain heat
22 exchange of combustion technology and that's -- that
23 defines it, not necessarily the type of air atomizing
24 that Brookhaven may be doing or whatever. So I think
25 that that's kind of clear.

1 The area of technology that I think is
2 difficult is that we have decided by ruling on the
3 location of the boiler versus the location of the
4 furnace. And I think that's confusing to the public in
5 that both should be rated under the same environmental
6 conditions, and my recommendation would be that we
7 consider boilers and furnaces to be rated under the
8 same environmental conditions, either isolated or in --
9 in the building, one of the two, but not mixed cats.

10 MR. BROOKMAN: Cyrus and then to Harvey.

11 MR. NASSERI: John, as you know, that the
12 legislation determined the minimum efficiency standard
13 for furnaces based on isolated combustion system, which
14 simply means you know that the combustion air is coming
15 from outside, not communicated with indoor air. And
16 then, that has a minimum of 78.

17 And legislation very closely looked at the
18 boilers to be installed indoors, and because of that
19 and not having a jacket loss, that went up to two
20 percent of 80 percent, and that's the reason between
21 boilers and furnaces having a two percent differences.

22 But my question at this point is, you know,
23 the boilers are different -- excuse my language --
24 animals than furnaces because their nature of operation
25 and everything else. And how does the ICS effects the

1 operation and performance of the boilers if there -- if
2 your comments is, you know, appropriate at this point
3 for the Department to look at and put in -- let's say
4 putting both of them under ICS or putting furnaces
5 under indoor and jacking up, you know, the minimum,
6 which was 78 to 80 percent in the rule of thumb.

7 MR. MARRAN: If I can answer Cyrus directly?
8 It's John Marran again.

9 I -- I believe that boilers would be
10 penalized if they were isolated. But in reality,
11 there's very few boilers located in, quote, "the living
12 space." Most boilers are in basements. Basements
13 under new construction standards now have insulation
14 between the basement and the floor above and the
15 basement will stay 55 degrees whether there's heat down
16 there or not typically because of ground temperatures.

17 So, I think the jacket losses from boilers
18 are significant. I believe that they can be looked at
19 as a loss in -- being -- in that they are not in the
20 heated space. Many boilers get put in garages.
21 They're much the same as furnaces these days. So, I
22 think there's a difference.

23 The thing that disturbs me is this program is
24 intended to advance and improve energy efficiency. We
25 should be doing everything we can to do those things

1 which will advance energy efficiency and energy economy
2 and if the congress legislated certain things that were
3 not proper, we can't keep running down the same road to
4 2012.

5 MR. BROOKMAN: Harvey?

6 MR. SACHS: If I understood Mr. Crawford
7 correctly, I must take exception to the proposal that
8 the Department ignored any technology which has not had
9 a continuous increasing technology acceptance but which
10 has been tried and perhaps lost marketshare. There are
11 many reasons in terms of energy prices and other
12 factors over the last couple of decades. We can see
13 many products and technologies which for the next
14 decades might have great value and we do not believe
15 that a prior market failure is a priore reason to
16 exclude a technology in the screening analysis and it's
17 very important to us.

18 MR. BROOKMAN: Okay. Other comments?
19 George, and then to Carl Adams. On specific
20 technologies. We'll be breaking here shortly, folks.

21 MR. KUSTERER: I know I'm outclassed. George
22 Kusterer, Bock Water Heaters.

23 I'd just like to comment on -- on my
24 colleague Mr. Stanonik. But this is directed to Cyrus.
25 With regard to atomizing oil, whether it's air

1 atomized, which is currently being pursued by
2 Brookhaven National Laboratory, or whether it's
3 pressure atomized, which has been around -- with
4 Columbus, maybe?

5 But let us not forget that air -- air
6 atomized furnace is nothing new. It's about as old as
7 dirt. So, even though it may be new technology, and I
8 agree with Mr. Marran as well, I think the end result
9 -- I mean if we burn peat, if we burn coal, so long as
10 the end result is efficiency and a reduction in air
11 pollution, then that should be our ultimate goal, not
12 how the unit is fired or how it is vented.

13 MR. BROOKMAN: Did you wish to --

14 MR. NASSERI: Specifically --

15 MR. BROOKMAN: Cyrus Nasserri.

16 MR. NASSERI: Cyrus Nasserri, Department of
17 Energy.

18 To what we referred on that, we know that
19 atomization of oil for burner was there from the years
20 of Columbus and nothing has happened since then. But
21 combustion -- the combustion air coming for that
22 process of combustion to take place and this unique
23 process is using almost 10 percent of what is normally
24 used for doing the job in other -- other burners. And
25 that's the one that we would like to really to consider

1 and see how efficient this burner or this device is
2 compared to others.

3 MR. BROOKMAN: Go ahead, John. Follow on.
4 George, you can --

5 MR. MARRAN: Just to follow up on that, as
6 long as you can get less than a number one smoke and as
7 long as you can get 273 stack temperature and 88
8 percent efficiency, it doesn't matter whether it's air
9 atomized using less air for combustion or a fan that
10 does it. So, I think the end efficiency numbers are
11 really the inhibiting issue.

12 MR. BROOKMAN: Okay. George, follow on and
13 perhaps we'll --

14 MR. KUSTERER: Just one more quick comment.
15 What John is saying is very true. It's the end result.
16 One of the big problems that we're -- we're hanging our
17 hat on or looking to write a standard around is
18 something that has not been accepted in our industry.
19 So, how could you write a standard on something that's
20 basically still a prototype? I don't know if you
21 remember this, but many years ago we had such a thing
22 called the Babbington burner, which now the government
23 buys at a good price. But it was not accepted in the
24 field.

25 So, you can't hang your hat or write a

1 standard on anything that's not going to be accepted in
2 our industry or that may have the potential of not
3 being accepted.

4 MR. BROOKMAN: Final comments on the
5 technology issues? Carl and then to Michael Martin.

6 MR. ADAMS: Carl Adams, DOE.

7 I guess there were two things I wanted to
8 mention about screening. Being as how we are required
9 to look at setting the standards at the highest level
10 that can be justified, for screening considerations I
11 would like to get some comments written perhaps on gas-
12 fired heat pumps, which I believe was a design option
13 that was considered long ago in the ANOPR on this
14 product.

15 And secondly, for screening purposes there's
16 been some discussion about a design option of
17 condensing furnaces. If one thinks in terms of a
18 national standard and thinks in terms of health and
19 safety issues, are there issues along those lines from
20 a screening standpoint that should be considered for
21 screening in or screening out condensing products?

22 MR. BROOKMAN: Thank you. Michael Martin?

23 MR. MARTIN: Yes. I -- I sense in the recent
24 discussion that we've kind of got off track a little,
25 that what we're really discussing is Jim's necessity to

1 come up with various different ways that you can
2 increase efficiency so that he knows which to consider
3 and which not to consider and not the question as to
4 what standard should be set. And I think we've gone
5 all around the subject here by mistake.

6 MR. BROOKMAN: Jim, did you have anything
7 final to say at this point?

8 MR. CRAWFORD: No, I do not.

9 MR. BROOKMAN: Okay. Then I'm going to
10 suggest we take a break. It's 10:55. We'll resume at
11 10 minutes after 11. Thanks for a good start this
12 morning.

13 (Brief recess)

14 MR. BROOKMAN: Taking your seats, please.
15 We're going to begin here shortly.

16 (Pause)

17 MR. BROOKMAN: If you haven't already done
18 so, please sign in with Crystal at the -- registration
19 desk. The Department will provide an updated version
20 of the attendee list for all of you.

21 And second, we just wanted to check in on --
22 for those of you that are new at -- in this workshop
23 environment, as I've been looking around the room I
24 think pretty much you're staying with us pretty well.
25 I mean it looks as though -- I don't see any great

1 discomfort out there, but -- but so, I think we're
2 doing okay, yes? So far? Pretty much. I think so.
3 Okay.

4 Then, I'm going to -- let's take it back,
5 then, to Mark Kendall to describe engineering analysis.

6 Please take your seats and let's hold down
7 the sidebar conversations.

8 (Pause)

9 MR. KENDALL: We've got six slides to cover.
10 I'm going to try to get finished before the --

11 MR. BROOKMAN: Excuse me. Yeah.

12 (Pause)

13 (Slide)

14 C. Engineering Analysis

15 1. Overview

16 MR. KENDALL: Okay. We've got -- we've got
17 six slides and 45 minutes, I hope, so that we can break
18 for lunch after this presentation.

19 This is the presentation on -- if we had the
20 flow chart up here on the screen it would be the
21 engineering analysis. You'd be able to see what the
22 inputs were and what the outputs were. And this phrase
23 is something that's specific. We use it with specific
24 meaning in the rulemaking. You might have your own
25 idea of what "engineering analysis" means, but for the

1 rulemaking it's the analysis by which we develop the
2 relationship between the cost of the product and its
3 efficiency, and that's an important input for several
4 downstream analyses: the calculation of consumer life
5 cycle costs, manufacture impacts, and employment
6 impacts to name a few. And depending on how we do the
7 engineering analysis, we can get other information that
8 might be useful elsewhere.

9 So, the next few slides will explain -- will
10 explain our philosophy about the engineering analysis,
11 different ways we can approach it, and we'll be
12 soliciting your ideas of what aspects of the
13 engineering analysis are important for the furnace and
14 boiler rule specifically since we've built up some
15 experience over the last several rules in this area.
16 We've got some of our own ideas but we want to make
17 sure we bounce 'em off you before we go full bore.

18 MR. BROOKMAN: Yeah. I hear -- I see one
19 overview question. Harvey?

20 MR. SACHS: Yes, sir.

21 MR. BROOKMAN: Please get to the microphone.

22 MR. SACHS: Ya'll put a long -- short leash
23 on that one. Harvey Sachs, ACEEE.

24 Looking at the first graph on engineering
25 analysis overview, the left side, "Equipment Cost

1 Efficiency Relationship." Would the Department be so
2 kind as to share the empirical basis for that graph?

3 (Laughter)

4 MR. SACHS: Is this intended to be a snapshot
5 in time? Is this intended to be a -- a projection that
6 incorporates a couple of decades versus -- of
7 technology change? It -- it's an important myth, and I
8 say "myth" in the most noble sense. But it does seem
9 to be informing the analysis.

10 MR. KENDALL: Okay. This graph is
11 illustrative. There's no numbers on -- shown on this
12 graph. This is for the transcript. The titles of the
13 axes along the bottom are "Product Efficiency,"
14 indicating as the efficiency of the product increases
15 you go -- move to the right. On the left is
16 "Production Cost." We could also phrase that in terms
17 of retail price to the consumer. Those might not be
18 directly mappable onto each other. That implies as you
19 move up you become more expensive.

20 The standard default assumption of any of
21 these products, which I take it you might be disputing
22 in this case, is that as the product becomes more
23 efficient it also becomes more expensive to produce.
24 That's the only purpose of that graph, so that people
25 have a mental picture in their minds of -- of what this

1 is. This isn't a graph along time. The graph itself
2 might change with regard to other factors.

3 MR. SACHS: Mr. Kendall, I -- I raise this
4 point in particular in view of analyses that Mr.
5 McMahon has done on another class of product, which
6 happens to be refrigerators, which is a secular trend
7 over two decades. It's a rather pronounced decreasing
8 cost as a result of really remarkable accomplishments
9 by the manufacturers to improve their products. As
10 efficiency essentially doubled, the costs in inflation
11 normalized terms declined by about 30 percent so that I
12 just want to make the point that the embedded
13 assumption here is of a snapshot while we're dealing
14 with a process that has a dynamic time element.

15 I'm not disputing that today a more efficient
16 furnace costs more, although there's a great deal of
17 scatter in the data, as I understand it. But I think
18 that it's very important that we examine our myths as
19 well -- before we call them engineering analysis.

20 MR. BROOKMAN: Okay. Thank you, Harvey.

21 MR. KENDALL: That made it much more clear.

22 (Slide)

23 MR. KENDALL: Okay. Second slide.

24 Since the cost efficiency relationship is so
25 fundamental to everything the Department has to look at

1 in its analysis, we thought it was important to lay out
2 some principles that the Departments felt were
3 important that the -- the relationship must display.

4 So, the first one is credibility. Two
5 bullets under that for what -- generally what that
6 means to the Department based on acceptable estimation
7 techniques. There may be different ways to get this
8 information. We'll talk about some of those ways
9 later.

10 Incorporates and reconciles available data
11 from multiple sources. So, this means, assuming that
12 it's multiple sources of this data, to the extent that
13 they can be compared to each other and reconciled, that
14 -- that helps the credibility of the analysis.

15 Transparency is the second one. It's
16 important from the Department's perspective to conduct
17 analyses that are open for review, that people can
18 provide input into individual parts of the analysis,
19 and that even though it's transparent it also protects
20 information that may be proprietary. So, if a firm,
21 for example, gives the Department precise cost
22 information on its products the Department is not going
23 to reveal that to the public and there's issues about
24 how that data is hidden -- are hidden.

25 The third bullet point is specific, similar

1 to transparent but "specific" meaning detailed enough
2 that it's possible to verify each piece of information
3 independently. Importance there is a single set of
4 cost efficiency estimates. So, while the Department
5 would like to compare data sources, ways of coming up
6 with cost efficiency relationships, it's important from
7 the Department's perspective to use only one
8 relationship, one set of data as the basis for its
9 analysis. It -- it doesn't want to go along the
10 analysis for the next three years using two or three
11 competing sense of -- sets of data. Prefers in this
12 case to use one set of data that at the beginning has
13 as much input from as many different stakeholders as
14 possible and is as close to a consensus data set as the
15 -- the -- as the Department will come up with.

16 And then the point about quantified
17 uncertainties, in any analysis there's always
18 uncertainties, there's always variability.
19 Department's going to make a sincere effort to try to
20 capture that in this analysis.

21 Last bullet point is timely. It's important
22 to the Department to be able to maintain its schedule
23 that it lays out for the rulemaking, so since this is
24 one of the upstream analyses and a lot depends on it,
25 the engineering analysis has to proceed in accordance

1 with the Department's schedule in order for it to meet
2 its final schedule.

3 All right.

4 MR. BROOKMAN: Jim?

5 MR. CRAWFORD: Jim Crawford. As a
6 participant in the ongoing air conditioning rulemaking,
7 I appreciate the desire to have a single cost
8 reference. However, if that cost reference is not from
9 the industry you're headed down the same path again.
10 Any questions that the industry has about whether or
11 not the costs have been low-ball are going to lead to
12 the same situation that we have right now on air
13 conditioning and there's no way to avoid it other than
14 to accept the industry data.

15 MR. KENDALL: We'll be talking over the next
16 few slides about ways that -- that the Department can
17 utilize input from the industry.

18 Okay. Slide #3.

19 (Slide)

20 MR. KENDALL: This lays out some of the --
21 I'd say most of the places that we recognize we can get
22 efficiency data, so the next two slides, the first one
23 is the efficiency part of the draft. The second one is
24 the cost part of the draft. Some of those are the same
25 sources. Some of those -- some of these sources only

1 give you one of those pieces.

2 So, you see we also tried to list a primary
3 advantage and disadvantage of each of these sources in
4 the context of the rulemaking. So, for example, the
5 first one, manufacturers and suppliers. Primary
6 advantage: they produce the products. They have
7 direct access to what the cost of that -- those
8 products are. The disadvantage -- primary
9 disadvantage: that data is -- is a lot of times
10 considered to be highly proprietary and not available
11 to the public.

12 And we can go on. I won't read the advantage
13 and disadvantage unless we want to have a discussion
14 around some of these points.

15 Testing/rating, those product ratings we
16 heard this morning that there may be examples where
17 some products are rated at a particular level although
18 they actually perform at another level, so that's an
19 issue there.

20 Technical literature. For example, if we're
21 assessing some design options there may be literature
22 available that will discuss the performance of certain
23 technologies.

24 Engineering estimates. This would be
25 experienced engineers, manufacturing engineers, design

1 engineers who supply data based on their own experience
2 and some calculations on the side.

3 Simulation modeling, which would be system
4 performance based on some software that's been
5 calibrated and based on empirical data or theoretical
6 data.

7 And these are all -- again, these all provide
8 information on efficiency of product.

9 And the bottom one is prototyping. Actually
10 build a product, test it, see what happens.

11 So, those are different sources the
12 Department could rely on for the efficiency side of the
13 equation.

14 (Slide)

15 MR. KENDALL: On the next page are the
16 sources for -- some sources for cost information. You
17 see the similar ones over there on the left.
18 Manufacturers and suppliers again. Not only do they
19 know the efficiency of the products they produce, they
20 know the cost of those products.

21 The second one is teardown analysis coupled
22 with engineering evaluation where the Department could
23 purchase products from the marketplace, disassemble
24 them, examine them, do their own cost estimation on
25 those products.

1 The third line is list prices. Although this
2 may not provide direct information on the cost of the
3 product, it can provide direct information on the price
4 of the product. For the furnace and boiler market, we
5 recognize that these furnaces and boilers are typically
6 installed by contractors, sold as part of a system, and
7 that retail prices for these products may not be
8 published anywhere. If they are, please let us know
9 what those data sources are because that gives us one
10 other source of information that we can use when we are
11 -- are calibrating the cost information that we would
12 come up with.

13 Also, from the life cycle cost perspective of
14 the consumer, it's the price that matters, not the cost
15 of the product.

16 And then finally, public -- public data,
17 which census is an example. There may be data out
18 there that is freely available that everyone can share
19 but may be too highly aggregated in the level it is now
20 so the Department can -- to really rely on.

21 So, that's probably a good point to have a
22 little bit of discussion.

23 MR. BROOKMAN: I see several people wish to
24 speak. Charlie, Bill, Jim, and Harvey.

25 MR. STEPHENS: I just -- Charlie Stephens,

1 Oregon Energy Office.

2 Just want to let you know that -- let the
3 Department know that as long as you're on this
4 particular timeline within a few months we're going to
5 start collecting price data, separate labor and -- and
6 equipment price data for the higher end of the
7 efficiency ranges for both furnaces and boilers, so by
8 the time the Department's ready to make some decisions
9 we should have substantial amounts of data by model
10 number if -- if that's desired.

11 MR. KENDALL: Is that going to be Oregon?

12 MR. STEPHENS: It -- yeah. Publicly
13 available information and we'll provide it at the right
14 time to the Department when they're -- if -- for
15 verification purposes, if nothing else.

16 MR. KENDALL: Thank you.

17 MR. BROOKMAN: Bill Prindle?

18 MR. PRINDLE: Well, the Department faces a
19 challenge here in trying to project what a product is
20 going to cost many years into the future. And
21 certainly, you know, manufacturers' data is one source,
22 teardown analysis is another. And Charlie's listed a -
23 - a source that I think should be included.

24 There are states in which there's a
25 relatively high penetration of high efficiency

1 equipment which will give you not a perfect projection
2 but will give you a more accurate picture of what a
3 market might look like when a product is in a mature
4 stage or introduction as opposed to a premium niche
5 product as -- as a high efficiency product typically is
6 now. So, I know the state of Wisconsin, for example,
7 has a very high penetration of high efficiency gas
8 furnaces. That's one source that I'm sure some survey
9 data can be produced from.

10 So, we'd like to see that included as part of
11 the analysis and it's -- it's pretty critical for the
12 life cycle cost analysis. Certainly, looking at
13 historical data from the census, there seems to be
14 relatively little impact on a lot of the products that
15 have gone through standards as far as their actual
16 market price goes and yet, you know, there -- there's
17 something of a disconnect between that and what some of
18 the projections are.

19 So, it's a tough challenge but we suggest
20 that you try and use as many of these sources as you
21 can.

22 MR. BROOKMAN: Jim Crawford?

23 MR. CRAWFORD: Jim Crawford, Trane.

24 I was a little bit surprised to see list
25 prices there. There aren't any retail list price

1 catalogues that I'm aware of now that SEERS doesn't
2 publish that information. And the readily accessible
3 wholesale prices also rather surprises me there. I
4 would have guessed that most of the wholesale price
5 lists are probably proprietary information.

6 MR. KENDALL: Thanks.

7 MR. BROOKMAN: Harvey?

8 MR. SACHS: I'd like to second Bill Prindle's
9 comments and look just a little bit more deeply at the
10 publicly available data, e.g. census. I believe the
11 history of products covered by standards by now is rich
12 enough and the productivity improvements by the
13 manufacturers in their employment trends are well
14 enough understood that the secular trends must be a
15 significant component of the analysis. Every
16 manufacturer I speak with talks to me about his
17 productivity improvements even over the last five
18 years. And if you don't de-trend that but try to look
19 separately at employment impacts, you're going to get
20 an awful lot of noise masking your signal so that it is
21 -- I believe commend to the Department a serious review
22 of the secular trends as well as a review of the one
23 area that was suggested by Bill or implied -- I
24 inferred it from what Bill said, and that's the -- the
25 historical record of the Department's own projections

1 of manufacturing cost impact as compared with the
2 revealed market facts. Thank you.

3 MR. BROOKMAN: Thank you. I saw some other
4 folks, I believe, on this side of the table. Did I
5 miss -- no? Okay. Frank Stanonik?

6 MR. STANONIK: Frank Stanonik with GAMA.

7 Certainly bothered by one of the things I'm
8 hearing here, which is a suggestion that -- I'm going
9 to call it the price the consumer pays, that if you go
10 out and get a lot of information on that today that's
11 really going to be a wonderful thing in this
12 rulemaking.

13 We just went through a rulemaking on water
14 heaters. That aspect of the rulemaking in our opinion
15 was a disaster. First of all, what you're looking at
16 in the rulemaking is trying to project manufacturing
17 impacts, manufacturing costs for some as yet undefined
18 minimum efficiency level, okay? And yet, you're taking
19 a snapshot of the market today of what products sell
20 for under whatever localized or particular market
21 forces might be driving any particular market.

22 And I think what we learned, if we didn't
23 know it before that, we learned that with the water --
24 water heater rulemaking is those two things are not
25 compatible. And -- and we are very concerned about

1 putting too much faith or stock in -- in any analysis
2 or looking at manufacturing impacts or other impacts
3 that gets into a lot of looking at, well, what's it
4 sell for today in this region or that region? We just
5 don't see that that's a very useful exercise.

6 The other comment I want to make, and at this
7 point only a comment because I really haven't -- we
8 haven't had the opportunity to discuss it further, is
9 that we believe -- well, it's our belief that there
10 certainly is a difference in consumer price when you
11 look at a replacement situation versus the unit that
12 comes with the new house they buy. And I -- and
13 without really having a good sense of how significant
14 that is, we think there is something there that needs
15 to be looked at because the -- when the consumer buys
16 that new home very often, you know, they get whatever
17 comes with the new home and they probably don't have
18 any idea what they paid for the furnace or the boiler
19 or whatever. It's whatever the builder was able to
20 determine as a price, and I guess that depends on a lot
21 of factors. But it's a significant enough difference
22 we think that DOE needs to look into it.

23 MR. BROOKMAN: Thank you. Other comments on
24 these cost data sources?

25 (Slide)

1 MR. KENDALL: Okay. On the fifth slide, in
2 the framework document we thought it was important to
3 put out there for comments a straw man approach. It's
4 always easier to talk in tangible terms rather than
5 abstract terms.

6 So, to try to put some pieces together that
7 gives you some indication of what our thinking is right
8 now based on our knowledge of the market, this is the
9 approach that we've laid out in the framework document.
10 The intention of this is to stimulate some discussion
11 about the pros and cons of different aspects, to get
12 your comments in writing on that as well as whatever
13 discussion we want to have here, and to stimulate some
14 creative alternatives for the Department to consider.

15 So, the first step we would undertake would
16 be to gather as much publicly available information as
17 possible. That's pretty much a rule of thumb that the
18 Department does on all of its rulemakings is try to
19 collect public information into one point.

20 The second point is based on the discussion
21 we had on baseline products. Select representative
22 samples of products for analysis. That again is going
23 to be important for -- for helping define what the cost
24 of the product is and what some of the design features
25 of the baseline products might be. That's also not

1 just baseline. Could be higher efficiency models as
2 well. So, once we've established what the baseline
3 products are, we'd like to know what are some examples
4 of higher efficiency products that can serve us as --
5 as a good representative sample for the analysis.

6 The third point is very important. It's
7 something we've tried to do in the past and we hope we
8 can refine in this rulemaking, is to work with
9 manufacturers to identify appropriate samples for
10 teardown and to obtain design data for additional
11 samples. This is one of the more specific ideas, but
12 basically the concept here is we would work with
13 individual companies under the auspices, maybe, of the
14 Trade Association to identify those products that are
15 on the market today that we could develop cost
16 estimates for. And if manufacturers are hesitant to
17 provide the cost information to a degree that can be
18 examined and reviewed publicly, then we have the
19 ability to take, say, bills of materials for those
20 products, do our own cost estimates for those products,
21 confer with the manufacturers and iterate until we get
22 something that is close that -- that we can agree on,
23 the manufacturers can agree on, and combine that data
24 so that it can be represented publicly without
25 revealing anything about any one particular

1 manufacturer.

2 So, this is -- this is a concept that we'd
3 like to pursue, understand what the drawbacks of that
4 would be, understand what the benefits would be. One
5 of the primary benefits we would see is that it would
6 produce a single set of cost data and it would -- it
7 would be done in a way that it would get the data from
8 the manufacturers which we've identified as being the
9 ones with direct access to that data but still allow
10 the Department to present it in such a way that the
11 public can see the assumptions that went into the
12 development of that data.

13 The third -- the fourth point, we noted that
14 in the furnace market especially there are gaps between
15 efficiency levels, so there's a cluster of equipment at
16 78, a cluster at 80, maybe one or two above that, 82,
17 82.4, something. If we did step three, we would like
18 to make sure we had a family -- products within a
19 family from a particular manufacturer. If there's gaps
20 in that product line and we're looking to assess an
21 efficiency -- a standard level at, say, something like
22 81.5 and there's no product on the market at 81.5 or
23 there's one manufacturer who has a product there, that
24 could cause difficulty in presenting that data to the
25 public.

1 So, one of the things we could bring to bear
2 at that point is the use of simulation modeling to fill
3 in those gaps and we would try to use design
4 information that we recognized that determined from the
5 teardowns as well as testing information to calibrate
6 those simulation models so that we had a good, robust,
7 cohesive analysis that we could have the flexibility to
8 examine different possible ways of achieving those
9 different efficiency levels.

10 But the Department recognizes that it's going
11 to establish an efficiency standard, not a design
12 standard. So, whatever flexibility it can have to
13 assess different ways to achieve that standard will
14 help enrich the analysis, explain the variability maybe
15 and cost data and eliminate different approaches to
16 reaching the standard.

17 The one, two, three, four, fifth point is
18 obtain reviews by stakeholders. That, again, like the
19 first one, really goes without saying. The process
20 rule that the Department's published several years ago
21 now really tries to open up this whole analytical
22 process to input from stakeholders. So, at various
23 points throughout the process whichever one we use for
24 the engineering analysis, there'll be times where we
25 want to present intermediate results and -- and get

1 some feedback from the public.

2 The last one is reconcile results and
3 characterize uncertainty. Again, whatever data sources
4 we use to develop the cost efficiency relationship,
5 we're going to have to reconcile those. So, one of the
6 drawbacks -- potential drawbacks of doing, say,
7 teardowns and simulation modeling and whatever other
8 thing you can come up with is that those -- all those
9 results if they conflict have to be reconciled at the
10 end in order for the Department to achieve its goal of
11 having a single set of cost estimates.

12 So, those are our questions that we would
13 have to consider as we're defining what methodology we
14 would use.

15 So, again, this is the proposal that we laid
16 out for input and reaction from all of you to stimulate
17 some of your thinking on alternative ways we could
18 approach this. And I think now I'd be happy to answer
19 questions to explain more about any of the details of
20 what I've described or to hear your views on this
21 process or any other process that you're aware of that
22 could allow the Department to determine the cost
23 efficiency relationship.

24 MR. BROOKMAN: Jim Mullen?

25 MR. MULLEN: Jim Mullen, Lennox.

1 A couple comments. I guess one --

2 MR. BROOKMAN: Jim, you gotta get closer.

3 MR. MULLEN: A couple comments. First, I'm
4 not sure if the engineering analysis is the section
5 that includes the markups from manufacturing costs to
6 end user but --

7 MR. KENDALL: We can talk about it in either
8 the engineering analysis section or the life cycle
9 cost, but I will have a presentation on that in a
10 second. It's in the next --

11 MR. MULLEN: So, I'll hold most of that
12 point. The second one, and it may be in the same vein,
13 but you're essentially going to go out and establish
14 costs for products in 2002 or 2003 but in this case
15 since the rule doesn't go into effect until 2012, is
16 part of the engineering analysis to look at what'll
17 happen to the basic commodity prices between now and
18 2012?

19 MR. KENDALL: That's --

20 MR. MULLEN: -- straight line in this thing?

21 MR. KENDALL: Yeah. We've heard a couple
22 comments so far about projecting trends. We heard
23 about productivity improvements, historical
24 productivity improvements. You raised the question
25 about commodity price projections. The -- the default

1 position on projecting trends is if there is an
2 impartial source of projection information that has
3 general support so it's not all one particular group of
4 stakeholders supporting it, then that's something that
5 the Department would seriously consider including in
6 the analysis. If there are trends that are projected,
7 the Department really would like to understand the --
8 the theory behind why those trends exist so that it can
9 be aware of whether they'll continue in the future and
10 make an independent assessment of -- of the merit of
11 those trends for the purposes of the rulemaking.

12 So, if there are -- and I know there are
13 projections, maybe not 15-year projections, 12-year
14 projections on commodities. I know there are short-
15 term projections available for commodities prices and
16 if -- you know, if a group of stakeholders want to get
17 together and agree on particular sets of trends that
18 they'd like the Department to consider.

19 Another one that comes to mind not related to
20 the cost of the product that is this question of are
21 homes getting bigger, are envelopes getting tighter?
22 You know, what should we talk -- talk about input
23 capacity and output -- or input rating and output
24 capacity? These all fall into the same group, so if
25 you'd like to present those to the Department for

1 consideration we'll definitely be willing to consider
2 them.

3 (Pause)

4 MR. BROOKMAN: Yes. Harvey?

5 MR. SACHS: Harvey Sachs, ACEEE.

6 Just, again, to reiterate that the additional
7 perhaps fifth form of analysis is the historical review
8 of trends and of the accuracy of the projections.

9 MR. KENDALL: Thanks.

10 MR. SACHS: Trends in employment, trends in
11 cost, and calibrating the Department's projections and
12 other stakeholder projections against what has happened
13 in the market for various products.

14 MR. KENDALL: Thanks. We'll be aware of
15 that.

16 Another point that Jim Mullen raises in my
17 mind is the question of what costs the Department is
18 actually trying to consider in the analysis. And they
19 pay particular attention to not using at -- just -- not
20 accepting at face value the cost of a product today
21 because they recognize that a more efficient standard --
22 -- say we're talking about -- it's always dangerous when
23 I use an example like this.

24 Say we're talking about a '79 AFUE standard
25 and we have a '79 AFUE product on the market. The

1 Department really does put some effort into
2 understanding how the product under the new standard
3 would be different from the product at 79 AFUE today.
4 So, that might include not only the higher sales volume
5 of that product and how that effects the manufacturing
6 costs but different features that may or may not be
7 included under a new standard as well as this time lag
8 of 10 years or whatever before the Center goes into
9 effect. So, any insights that, you know, you'd like to
10 provide in those areas would also be considered.

11 MR. BROOKMAN: Dan?

12 MR. DEMPSEY: Dan Dempsey with Carrier.

13 I think it -- it's good to look back in terms
14 of the history and -- and trends, except the one thing
15 you have to be careful of is how you project that trend
16 to the future. I mean there's been 80 percent AFUE
17 furnaces on the market for over 20 years. There's been
18 a lot of productivity gains over that time but you do
19 hit diminishing returns, so you can't just assume the
20 gains made in the past 20 years can be straight-lined
21 to the next 20.

22 MR. BROOKMAN: Jim Crawford?

23 MR. CRAWFORD: Jim Crawford, Trane Company.

24 In the discussion you referred to the
25 importance of being able to distinguish presumably

1 between 81 and 81 and a half. My feeling is that
2 you're cutting the baloney a little bit too thin when
3 you start talking that way.

4 You are dealing with a situation where the
5 uncertainty band in your analysis is a great deal
6 larger than would justify one -- talking with a
7 straight face about that kind of a difference. The --
8 if you were in that neighborhood, the important
9 decision is going to be what level of -- of efficiency
10 is the maximum sustainable without significant risk of
11 condensation in the flues. And there's been no
12 discussion this morning from the podium about the
13 nature of those flues and the nature of those flues as
14 we go forward may be the driving -- the single most
15 important driving factor in what is technologically
16 feasible in furnace products -- non-condensing furnace
17 products.

18 MR. BROOKMAN: Thank you.

19 MR. KENDALL: Thank you. And that -- that is
20 an important point. And as always, if anybody has
21 available data that -- that can lend some numbers to
22 the types of flues that are -- that are currently in
23 the marketplace as well as this percentage of retrofit
24 replacement, new construction, these are all things
25 that the Department consider -- can consider in its

1 analysis.

2 MR. BROOKMAN: Yeah. Frank and then Dan.

3 MR. STANONIK: I just want to respond to one
4 of the things here regarding the teardown -- teardown
5 analysis. I don't know that we'll be able to do it
6 within the written comment period but GAMA is working
7 to provide our recommendations as to what would be an
8 appropriate set of samples to tear down which would
9 kind of create the box for what is out there today and
10 you could do an analysis on, so we will try and get you
11 that information as quickly as we can as far as what
12 types of models and what number to tear down.

13 The other thing that I see here is that you
14 mentioned conducting computer simulations as kind of
15 filling in gaps or whatever. And I'm not sure if it's
16 -- comes up later or not, but there was this question
17 in the framework document about, you know, what
18 computer simulations would be appropriate to use or
19 what are good ones to use or whatever. And we're
20 concerned about that 'cause right at this point we
21 really don't know that there are good quality computer
22 simulations that you could use to try and make some
23 let's say acceptable projections as to, you know, what
24 is your end result AFUE when you do this or that or
25 whatever.

1 I mean we've tried to look and see if we
2 could steer you to some places. We haven't found them
3 yet. So, I guess I wonder -- you've got it there but
4 do you really have any --

5 MR. KENDALL: Yeah, that kind of --

6 MR. STANONIK: -- what computer simulations
7 do you have in mind?

8 MR. KENDALL: That comes up on the next
9 slide.

10 MR. STANONIK: Oh, okay. All right.

11 MR. KENDALL: Yeah.

12 MR. STANONIK: Well, then we'll -- all right.

13 MR. KENDALL: And I -- I won't be able to,
14 maybe, talk to that to the detail that you'd like but -
15 -

16 MR. STANONIK: Okay.

17 MR. KENDALL: -- get LBL to talk about that.

18 MR. BROOKMAN: Dan?

19 MR. DEMPSEY: Dan Dempsey, Carrier.

20 This is being somewhat repetitive but I want
21 to say it for the record. There used to be 82 and 83
22 percent AFUE products in the middle -- early 1980s.
23 That was before changes were made to venting
24 installation codes. They were not a market success.
25 Since that time products have been redesigned at an 80

1 percent level to provide the necessary factor of safety
2 in terms of venting installation and practices. Many
3 of the 81, 82 percent products that are on the market
4 today would be not -- would be weatherized units that
5 don't have the concern over vent systems and
6 installations. So, anything over 80 would be a real
7 cause for concern for us in terms of reliability.

8 MR. KENDALL: Thanks.

9 MR. BROOKMAN: Yes. Jim?

10 MR. MULLEN: Jim Mullen, Lennox.

11 Just to follow up on Dan comments and the
12 general question of venting, there's a great body of
13 knowledge out there put together by GRI on what happens
14 in vents for furnaces and with extended run times for
15 boilers. Probably well worth your while to look at
16 that as you consider what the -- the maximum and
17 minimum level could be.

18 MR. KENDALL: Thank you.

19 MR. BROOKMAN: Other comments on this slide
20 and these specific bullet points?

21 (No response)

22 MR. KENDALL: Okay. The next page, 6.

23 (Slide)

24 MR. KENDALL: We don't have to spend much
25 time on it. I think these are more appropriate for

1 written comments.

2 The third bullet point, though, is the one
3 that Frank brought up on the last slide. These are
4 some of the models that we've identified as being
5 possible to use for simulation and boilers. There's
6 not one next to that, but I think we have identified
7 some alternatives, so -- some options. So, if you want
8 to have a discussion about this now we can but I'm
9 going to have to turn it over to someone else. So, if
10 you want to ask a question, go ahead and ask and then I
11 may make a hand motion to this general side of the
12 room. If not, we don't have to force it.

13 MR. NASSERI: Cyrus Nasser, Department of
14 Energy.

15 Specifically, we are interested to know the
16 status of some of these models, such as CONDHX,
17 whatever you pronounce that. And I know that there was
18 some activity -- some activities going on with GTI, or
19 used to be GRI, to develop -- refine this model, which
20 would be very helpful if you have a good simulation
21 model available for this analysis. And we would like
22 to know the status of that. I don't know who is
23 supporting that program. Used to be AGA, I think, or -
24 -

25 MR. BROOKMAN: We have a representative from

1 GTI here.

2 MR. NASSERI: GTI here? Oh. Yeah. Bob,
3 sorry. Didn't see you.

4 MR. HEMPHILL: Bob Hemphill. I'm
5 representing Gas Technology Institute.

6 Yes, Cyrus, we indeed -- I mentioned during
7 the break to Alex that we do indeed want to pursue with
8 Department of Energy. We did in an analysis in 1994 --
9 '93 time frame develop a model at Battelle that handled
10 the near-condensing furnaces. We do not have a model
11 that handles of the near-condensing to go to full
12 condensing. However, we should discuss that and we
13 should discuss the availability and how we can help DOE
14 maybe save some money in -- in the framework that we
15 had developed in the '93 - '94 timeframe.

16 MR. NASSERI: Thank you. These are the type
17 of thing that we are interested at this point, to find
18 out if there's any -- any other models that we are not
19 aware of at this point and is in developmental stage.
20 And you can share that information with us. It could
21 be used in this analysis to get a good result and
22 understanding for this program.

23 MR. BROOKMAN: Other comments on models or
24 the other -- other issues here specifically. Frank,
25 and then I'll go to you, sir.

1 MR. STANONIK: Just -- just a question. The
2 "FURNACE" in all caps, is that a simulation model? Or
3 is -- I'm thrown here 'cause you got "FURNACES" in all
4 caps and then you got "boilers" in lower case. So, are
5 you saying I need a model for furnaces or is this some
6 special model that's already out there? That is a
7 model?

8 MR. KENDALL: That's the acronym for a model,
9 yes.

10 MR. STANONIK: That's GRI's old model?

11 PARTICIPANT: Right.

12 MR. BROOKMAN: Okay.

13 MR. KENDALL: All right. So -- just so
14 everyone heard that, the capital F-U-R-N-A-C-E model is
15 the -- the name of the GTI model which goes into the
16 near-condensing range. Is that correct?

17 MR. BROOKMAN: Okay. Thank you. Yes, sir?

18 MR. LYNCH: Greg Lynch with Amana.

19 I'm not familiar with the current status of
20 some of these models, but I do know that when they were
21 first issued I believe to Mr. Crawford's point some of
22 those heat exchanges were based strictly on clamshell
23 type designs or serpentine clamshells or a variety of
24 heat changer designs, tubular, multiple tubular,
25 serpentine clamshells that are different from, maybe,

1 original work that those were based on, something that
2 would need to be looked at as you -- as you looked at
3 organizations that might update those simulation models
4 to -- to expand the capability to other types of -- of
5 heat changer designs because they were not inclusive at
6 that time.

7 MR. KENDALL: Thanks.

8 MR. BROOKMAN: Thank you. Jim?

9 MR. CRAWFORD: I guess --

10 MR. BROOKMAN: Jim Crawford.

11 MR. CRAWFORD: Jim Crawford. I guess also I
12 would encourage the -- the analytical team to visit at
13 least one manufacturer and look at the temperature
14 analysis of heat exchangers and what goes into trying
15 to ensure that you don't have cold spots anywhere in
16 the furnace that will cause condensing and to realize
17 that in the imperfect analytical world that we live in,
18 some real life margin's got to be left there to protect
19 our mutual constituency, which is the American
20 consumer.

21 MR. BROOKMAN: Thank you. Harvey?

22 MR. SACHS: Harvey Sachs. Just a procedural
23 point on this issue. Will the Department go to some
24 effort to establish how each of these models has been
25 calibrated against actual furnaces or boilers? I

1 realize that's a sensitive point.

2 MR. KENDALL: If you'd like the Department
3 to, then let the Department know what your position is.
4 I mean any model --

5 MR. SACHS: I think I have just.

6 MR. KENDALL: Okay. Any -- any model that
7 the Department would rely upon, we would make an effort
8 to make sure that it's a generally accepted, validated,
9 calibrated model for -- for any analysis.

10 MR. SACHS: The illusion is that the building
11 sector has been forced to rely on models that have been
12 accepted without being well calibrated in every case
13 against real buildings. And so, I think the record
14 should set an example by showing the calibration
15 against real furnaces however imperfect they may be.

16 MR. KENDALL: Okay.

17 MR. BROOKMAN: Other comments on these
18 bullets on proposed approaches? Yes, Frank?

19 MR. STANONIK: Well, taking that as your --
20 your -- that question as to are there any other issues
21 here, I guess the first bullet, which we really didn't
22 touch on too much on this page for right now, I just
23 want to indicate that GAMA certainly is willing to help
24 collect and aggregate manufacturing cost information
25 and that even if DOE let's say goes in a different

1 direction there, we would still be interested in seeing
2 draft aggregate costs that DOE might generate some
3 other way and then provide to our members so they can
4 provide some feedback as to the reasonableness of that
5 information and its -- their opinions as how it fits
6 their particular circumstance.

7 MR. BROOKMAN: Okay. Thank you. Other
8 comments on these? I think we're going to move on.

9 Do you want to try and take up retail prices?

10 MR. KENDALL: Yeah --

11 MR. BROOKMAN: Let's -- I'd like to press on
12 one more -- one more segment.

13 2. Retail Prices, Markups, and Installation Cost

14 MR. BROOKMAN: Mark Kendall again on retail
15 prices, markups, and installation cost.

16 (Slide)

17 MR. KENDALL: All right. The -- the markup
18 presentation, this is really the concept -- the concept
19 that we're trying to get across here is that the prior
20 presentation was focused on manufacturing costs, the
21 life cycle cost analysis needs, prices to the
22 consumers, and this is a question of how the two are
23 related, can we determine what that relationship is,
24 can we make some assumptions about that relationship?

25 So, the first slide is just an overview of

1 what I just said as well as -- let's see here.

2 (Pause)

3 MR. KENDALL: Three questions. And this is
4 the only slide in this presentation. So, I guess I
5 should read the three questions.

6 The first one is how will standards impact
7 equipment price, installation cost, maintenance service
8 cost? These are three of the components that are --
9 that go into the life cycle cost analysis. We can
10 spend in the -- in the engineering analysis time to
11 determine how standards will affect the cost of the
12 equipment. We also need to know whether the effect on
13 price will be similar. And one of the ways we can do
14 that is with markups, but I'll talk about that on the
15 next point.

16 Installation costs. The question there is if
17 -- a contractor will have to have a, if you will, a
18 baseline installation cost as well for the analysis.
19 The question is if the efficiency level moves up to a
20 more stringent level will that installation cost change
21 and why and by how much? And the same for maintenance
22 service cost. As the product becomes more efficient,
23 is the -- is there more maintenance required, less
24 maintenance required? Is the -- are the service
25 requirements higher or lower? Those are things we'd

1 like to know up front.

2 The second point is a question about the
3 markup approach. Basically, what that is, we've
4 developed this cost efficiency relationship in the
5 engineering analysis and that's the cost to
6 manufacture. So we'd like to then apply a markup -- a
7 manufacturer's markup, a distributor's markup, a
8 contractor's markup, sales tax. We'd like to do that
9 differently depending on product flow through the
10 distribution channels and come up based on that
11 representative equipment cost with a representative
12 equipment price to the consumer. That's an alternative
13 to the retail price data collection that we talked
14 about earlier where we tried to identify the cost of
15 the product and the price from an independent source
16 and then infer the markups.

17 So, the markup approach has some nuances that
18 we have to treat very carefully. For example, if the -
19 - the cost of the equipment goes up, do the markups
20 remain constant under the new standard as they are
21 under the current standard or do they increase or
22 decrease? We also would like to be aware of whether
23 markups increase as a function of equipment efficiency
24 today. So, is the -- the overall markup on a 78 AFUE
25 furnace different from that of an 80?

1 These are all questions we would have to
2 answer if we -- if we utilized a markup approach to
3 determining price and that's many more questions than
4 were on this page, which means we ran over.

5 The third question is -- I've touched on,
6 which is the question of if we do retail prices, how do
7 we isolate the equipment in that bundle of -- of costs
8 that the contractor services and equipment that the
9 contractor provides to the consumer.

10 MR. BROOKMAN: Thank you. So, comments
11 related to -- Bill Prindle.

12 MR. PRINDLE: Bill Prindle, Alliance to Save
13 Energy.

14 We commented on this same kind of issue in
15 the air conditioning rulemaking because a lot of the
16 issues are somewhat similar. And I guess there are
17 several points I would raise here. One is that our
18 experience is that markups in general are somewhat
19 higher for premium products than they are for base
20 products, both at the manufacturer and at the
21 contractor level and I would encourage you to
22 investigate that through surveys. I mean don't just
23 take my opinion. Go out and find out what the market
24 actually does.

25 I think we did comment in the air

1 conditioning rule that -- that you shouldn't assume the
2 same percentage markup based on a baseline cost, that
3 -- that you should be looking more at a -- especially
4 down on the contractor end of the -- of the delivery
5 chain, that, again, if it's not going to be a premium
6 product, it's going to be a baseline product, I would
7 think there would be somewhat of a fixed limit on
8 markups as opposed to a, you know, a straight line
9 percentage.

10 And then there's the whole issue of what's
11 happening in the HVAC contracting business. We've seen
12 a fair amount of consolidation in HVAC companies at the
13 retail level over the last few years. I think there's
14 reason to think that will continue and I would
15 encourage the Department to look into those trends.
16 And I know it's always hard to predict what's going to
17 be happening five or 10 years down the road, but those
18 trends do tend to reduce overheads, do tend to put
19 pressure on -- on markups, and so on.

20 And then the -- perhaps the hardest to
21 quantify issue is the way that the digital economy is
22 reducing cost in the -- the manufacturing and
23 distribution chain for all industries. We've seen some
24 evidence of that through the economy in the last few
25 years. Difficult to predict how that will have an

1 impact, but I think there is an impact there. And I --
2 I guess the -- the bottom line is -- is that we think
3 the Department ought to make some conservative
4 estimates or to curb some of their estimates based on
5 some of these market forces to the extent that the
6 survey data can support it.

7 And I'll be happy to supply any data that we
8 can come up with to our comments.

9 MR. BROOKMAN: Thank you. Other comments on
10 markups and other issues on this page? Jim Crawford?

11 MR. CRAWFORD: Jim Crawford. I guess start
12 off with the comment about consolidators. I don't --
13 marketing is not -- is not what I'm paid for but I try
14 to keep one eye on it. And I believe that that trend
15 is in fact moving the other direction right now, that
16 several of the consolidators have -- have gone
17 bankrupt. And we're talking about deconsolidation
18 rather than consolidation as the trend of the industry.

19 If we were -- if we had a consolidation
20 trend, however, it would be to me an interesting bit of
21 logic to assume that the greater consolidation would
22 lead to lower markups. That's not what the Department
23 of Justice would normally assume.

24 Relative to digital technology, the -- the
25 factories of the manufacturers represented here today

1 are fairly highly automated for those processes for
2 which automation is rational. You know, the -- the
3 gee-whiz robots that we -- that we saw in -- in -- on
4 the news and on various TV programs 15 or 20 years ago
5 never took off for lots of good reasons.

6 I'm going to switch gears now to the broader
7 question of markup. And I guess the -- maybe part of
8 my message would be that we need to strive for some
9 kind of rational balance and precision of the entire
10 analytical procedure. There's no point in trying to
11 estimate cost to .01 percent if you can't get within 20
12 percent on markup. And I would argue that you've
13 demonstrated that you can't get within 20 percent on
14 markup in a recent rulemaking.

15 So, you know, we -- we need to strike some
16 kind of reasonable balance in -- in this. Markup
17 information I don't think you're going to get from the
18 industry. You're not going to get it reliably, I don't
19 think, from -- from surveys because the markup that you
20 can get on a survey may or may have absolutely nothing
21 to do with the markup that the consumer will pay when
22 he's there with real dollars.

23 MR. BROOKMAN: The deficiencies in the markup
24 to date, what -- has it been variability? What -- what
25 -- what is -- what are you saying?

1 MR. CRAWFORD: Would you repeat your
2 question, please?

3 MR. BROOKMAN: I was wondering, Jim, you
4 talked about the problems with markup. I'm wondering
5 if you can be a little more specific so the Department
6 will have that information.

7 MR. CRAWFORD: The -- I think that we're --
8 we're pretty well on record about the markups that we
9 have seen estimated by the same parties that are
10 involved in this process when they were doing the air
11 conditioning and heat pump markup. The -- the markup
12 from manufacturer cost to manufacturer price bears no
13 relationship to what is going on in the industry today.
14 And if we manufacturers were operating at those
15 markups, we would be bankrupted.

16 MR. BROOKMAN: Okay. Thank you. Other
17 comments on -- on these bulleted points? Frank
18 Stanonik?

19 MR. STANONIK: I'll just work down the list.
20 Certainly, the first one, we think there are
21 significant possibly installation costs as you look at
22 some of the design options. I mean an obvious one if
23 you're looking at, as an example, going to condensing
24 technology, well then in a replacement situation, then
25 a consumer that had a less -- lower efficient furnace

1 who now replaces it with a condensing technology in
2 fact is going to buy a new venting system. So that's
3 an obvious one.

4 But in terms of maintenance service costs, we
5 think there are -- there's an overall issue as you
6 let's say increase the complexity of a furnace with
7 certain -- or a boiler with certain design options.
8 You're going to increase the maintenance costs as you
9 go to electronics and those things fail. The parts
10 just -- your repair bill gets higher. That has a
11 secondary effect and we think it's something the DOE
12 needs to be aware of.

13 As you get into these situations where a
14 consumer's repair costs go up, the decision point at
15 which they go from repair to replace I think is going
16 to change. Or let me rephrase that. I think you'll
17 have more occasions where they face that decision
18 because the repair cost will be now close or in their
19 minds close enough to saying, well, maybe I'll just buy
20 a new -- a new furnace or a new boiler. And we think
21 that that certainly will have -- in this rulemaking
22 that's something that needs to be looked at, especially
23 if you go into some very higher cost, newer, more
24 efficient components.

25 The second bullet here about the drawbacks

1 about applying a series of markups, I guess I would say
2 in general I think everyone probably knows at this
3 point there is no perfect way to figure out what the
4 real markups are. But we -- from our view, this
5 approach of looking at establishing some price and
6 applying a series of markups is the -- the best of the
7 worst and we would certainly encourage the DOE to -- to
8 use that approach. Again, none are perfect but our
9 experience is that's probably the -- the best you can
10 do.

11 And then on this last point, only 'cause I
12 get to say it again, we would strongly urge DOE to not
13 try and look at retail prices and derive markups from
14 that. It just won't work.

15 You have to keep in mind you're looking at a
16 -- you're trying to create this rulemaking where you're
17 looking at a markup of this mythical, representative,
18 single, baseline model. And yet, anybody who's in the
19 business, that's not what they build. They build a
20 whole series of models in a wide range of capacities
21 and offerings and capabilities and everything else.
22 And the reality is depending, you know, where they're
23 selling it and -- and what it is and everything, the --
24 the variations in the markups for any specific model
25 they sell, I don't want to say it's infinite but it

1 sure is wide.

2 And from the manufacturer's concern, and I'm
3 sure they'll correct me if I've gotten this wrong, but
4 I don't know that at the end of the day when these
5 companies who hope to stay in business and make a --
6 make a profit at the end of the day, they don't say,
7 well, here's Model 1234. Did I make a profit on that
8 one? You know, at the end of the day they're just
9 saying, well, did we make a profit this month? And to
10 that extent, you know, that's what drives them, if you
11 will. It's not necessarily that every model always has
12 to be profitable by of and by itself. The company has
13 to be profitable. And that goes to the very question
14 of what's the markup?

15 MR. BROOKMAN: Is it Bob?

16 MR. HEMPHILL: Yes. Bob Hemphill
17 representing Gas Technology Institute.

18 I'd like to expand on what Harvey said about
19 the verifying furnace models and heat exchanger models
20 and also verify and maybe expand upon what Jim was
21 saying. I think what we're saying here is we need to
22 verify all the realms of this, not just a computer
23 model on furnaces. You need to verify cost models that
24 you're using. You need to verify public information
25 that you use in this rulemaking. I think you have to

1 expand that. It's real easy to say if you come up with
2 a technical furnace or heat exchanger model it has to
3 be verified with an existing furnace or heat exchanger,
4 but you ought to use that same technique for
5 verification throughout the entire process on all the
6 models that you use.

7 MR. BROOKMAN: Thank you. Karen?

8 MS. MEYERS: This is Karen Meyers with Rheem.

9 And I just want to second a point that Frank
10 just made because I really thought this point was kind
11 of overlooked in the air conditioning rule. And that's
12 the installation cost impact between replacement and
13 new construction. Those two can be vastly, vastly
14 different. And I would just encourage the Department,
15 since there are millions and millions of gas furnaces
16 installed today, to take that and to into
17 consideration.

18 MR. BROOKMAN: Thank you. Charlie and then
19 George.

20 MR. STEPHENS: Yeah, I just wanted to
21 reiterate a point I made later and -- and expand on it
22 just a little. We -- we will be providing a
23 substantial amount of data ultimately on all of that,
24 including installation costs differentiated by new
25 construction by -- by replacement, by model number, by

1 -- by venting type, by venting modifications. We'll be
2 able to disaggregate all of that.

3 But again, the use of that information is --
4 is up to DOE. It's up to the Department. And the fact
5 is that it -- it -- I have seen no rulemaking that DOE
6 has actually completed so far that didn't land on an
7 efficiency level that represented products that are
8 already sold by manufacturers by the tens of thousands.
9 And to -- in the cases where the cost that was
10 projected in the rulemaking was equal to the retail
11 prices seen in -- in large regions of the country, it's
12 unrealistic to believe that no one's making any money
13 between the manufacturer and the retailer.

14 So, in those cases the Department has some
15 obligation to try to figure out why it is that there is
16 a disparity between zero markup and -- and retail
17 prices and costs.

18 So, even -- eventually you can make sense of
19 some of this data that you'll get but the use of it is
20 going to have to be as a system of checks and balances
21 because, as people have said, none of these methods are
22 perfect in gathering the information. None of them
23 represents potentially the long-range price. The
24 prices that we may provide may be nothing more than an
25 upper limit to ultimately what the prices are. But

1 your task -- the Department's task is unfortunate in
2 view of the timeline.

3 I can -- I can say with some assurance that
4 we're out to eliminate the space heating loads in
5 Oregon by 2012 in new construction, substantially
6 eliminate the space heating loads all together. How
7 you can account for that in your rulemaking is beyond
8 me on that kind of a timeline. Predicting 2012 is an
9 unfortunate task.

10 MR. BROOKMAN: George? So I'm sure the
11 Department would welcome anybody's empathy on this
12 matter.

13 (Laughter)

14 MR. BROOKMAN: George?

15 MR. KUSTERER: Let's -- let's do lunch.

16 Let's -- as in so many other products,
17 especially when we're dealing with new combustion
18 technologies, I think that the Department has to
19 seriously look at installation costs as well as
20 maintenance and service costs because with the new
21 combustion technology, regardless if it's oil,
22 regardless of it's gas, we're looking at an
23 infrastructure which is going to have to train
24 installers to put in this high efficiency equipment and
25 we're going to have to train our service techs who are

1 going to have to service this product. So these costs
2 are going to be a little bit different than what we
3 have today. So, I think the Department needs to look
4 at the infrastructure as far as the training that the
5 manufacturers will have to provide for these people.

6 MR. BROOKMAN: Thank you. Other comments on
7 this slide? Frank?

8 MR. STANONIK: Just -- just to state the
9 obvious, but I -- I want to make sure that we all see
10 it as obvious because it is a difference from certainly
11 the air conditioning rulemaking. I mean the other
12 factor we're talking here about is a safe installation.
13 And that will always be the first priority. And so,
14 when you look at the installation costs I think clearly
15 you have to recognize that the costs have to be based
16 on assuming that in fact it is a proper, safe
17 installation, that -- that we have a qualified
18 installer and he's done everything as the code requires
19 and that all the appropriate steps have been taken.

20 And in this case, if DOE -- if there are
21 questions about whether certain levels or certain
22 design options might reduce the likelihood you end up
23 with a safe installation, DOE must err on the side of
24 safety. And I say that because it's totally different
25 than the air conditioning rulemaking. I mean granted

1 air conditioning you got electricity. You obviously
2 want it wired properly. But after that there's --
3 shouldn't be significant safety issues down the road.
4 It's not the case with a combustion appliance and we
5 can't forget that.

6 MR. BROOKMAN: Thanks, Frank. Final comments
7 on -- yes, Harvey? Then Cyrus.

8 MR. SACHS: With -- with all due respect,
9 Frank, to some of us the air conditioner process does
10 have some safety implications in terms of indoor air
11 quality. It's a question whether you go slowly or
12 quickly perhaps, but not everyone has been unconscious
13 of the safety implications and health implications in
14 air conditioner processes as well.

15 MR. BROOKMAN: Okay. Cyrus?

16 MR. NASSERI: I think, Frank, what you're
17 saying, you're referring to the combustion appliances
18 and what the safety where you're talking about is
19 basically on flue issues and things like that. And
20 probably this is very close to the water heater rule
21 that we have done, as close as possible not comparing
22 to the air conditioner rule. And I'm wondering if
23 there was anything there in that rule which is all
24 completed that you have any comment concerning safety?

25 (Laughter)

1 MR. STANONIK: Well, I -- I mean, Cyrus, GAMA
2 put in our proposals what we thought the right level
3 for energy factors was during that rulemaking process
4 and DOE went a little higher. And we do have concerns
5 that there will be subsequent venting issues when we
6 get to those rules being in effect and being --
7 starting to be installed everywhere across the United
8 States. But at this point we'll have to wait and see.

9 MR. BROOKMAN: Final comments on this slide?
10 Let's go to lunch. It's 12:20. Thanks for a good
11 morning. I'm going to describe -- you can go turn the
12 record off -- wherever you can go to lunch for those of
13 you that don't know.

14 (Whereupon, at 12:20 p.m., the workshop was
15 adjourned for lunch, to reconvene at 1:20 p.m., the
16 same day.)

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1 1:21 p.m.

2 MR. BROOKMAN: Please take your seats. We'll

3 be commencing here very soon.

4 (Pause)

5 MR. BROOKMAN: Okay. Let's get started.

6 Please take your seats.

7 (Pause)

8 MR. BROOKMAN: We're about -- I have just one

9 small housekeeping item, I think. Is Michael Caldarera

10 here?

11 PARTICIPANT: He left.

12 MR. BROOKMAN: He left? Has he left for the

13 day?

14 PARTICIPANT: Yeah. He won't be back.

15 MR. BROOKMAN: Okay. Any of you that haven't

16 yet gotten a property pass for your PC, please see

17 Crystal or Brenda.

18 Okay. Then, thanks for being back here so we

19 can keep moving along with the workshop. That is, back

20 here on time.

21 Our next presentation is from Jim McMahon on

22 electricity consumption.

23 3. Electricity Consumption

24 MR. McMAHON: Welcome back. I'm going to

25 first refer to our road map over here. We've gotten

1 through the market and technology assessment, the
2 screening analysis. We're in the engineering analysis.
3 We're going to discuss one topic there, move into life
4 cycle cost and national impact, and that will bring us
5 to the advance notice stage. And then the rest of the
6 afternoon we'll be talking about subsequent analyses
7 for the later parts of the rulemaking. So, let's
8 finish up the engineering part.

9 (Slide)

10 MR. McMAHON: Electricity consumption. We're
11 still talking about residential furnaces and boilers,
12 gas- and oil-fired. Currently, only the gas and oil
13 consumption of these products is regulated. However,
14 the electricity consumption is significant and there's
15 a range of technologically feasible options to address
16 the electricity consumption already in the market.

17 DOE is proposing in this rulemaking to
18 consider the electricity consumption. There's a couple
19 of issues associated with that. The first is the need
20 to identify an indicator of the electricity
21 consumption. It's not contained in the AFUE. And
22 then, the implication of considering the efficiency of
23 the air blower and motor is that cooling impacts will
24 affect the life cycle cost, and I'll address that in a
25 moment.

1 (Slide)

2 MR. McMAHON: So, the need for an indicator.
3 One possibility, and this is certainly not -- certainly
4 not the only possibility but one we wanted to offer for
5 discussion, is basing the electricity consumption on
6 the annual auxiliary electrical energy consumption,
7 which is already in the test procedure. The industry
8 is familiar with this. In fact, the GAMA directory
9 contains EAE measures for each of the models.

10 The things that we have to address are that
11 this varies with burner capacity and it will also vary
12 with circulating fan capacity. So, in the instance of
13 a furnace that's installed without an air conditioner
14 and the same furnace installed in a different house
15 where there is an air conditioner, you'd have different
16 values. We need to figure out how to address that.

17 (Slide)

18 MR. McMAHON: This leads us to the cooling
19 impacts. If the circulating fan is more efficient, and
20 that's how electricity savings are achieved, that will
21 provide electricity savings not only during the heating
22 season but also during the cooling season. Now, the
23 same blower and motor are used by the air conditioner
24 as for the furnace and therefore it would be
25 appropriate for the life cycle cost analysis to compute

1 that benefit.

2 (Slide)

3 MR. McMAHON: So, this brings us to our
4 request for input. The current standards for
5 residential furnaces and boilers are based on the AFUE
6 only. As the manufacturers all know and I guess most
7 of you know, there is changes in electricity
8 consumption that are not reflected in the AFUE. So,
9 we're interested in input about the potential benefits
10 and drawbacks of supplementing the AFUE measure with an
11 electricity consumption indicator. We would like
12 comment on the most appropriate method and comment on
13 the best approach to addressing the cooling side
14 impacts. And then we'd like to open that up for
15 comments at this point.

16 MR. BROOKMAN: Thanks very much. So, I think
17 Jim cued that up well. David?

18 MR. BIXBY: David Bixby with GAMA.

19 Just want to let DOE know that there is a
20 GAMA engineering task group that's been assigned with -
21 - to study the relevant issues concerning electrical
22 consumption with respect to cooling -- consumers'
23 cooling needs. And so, we anticipate getting back to
24 DOE with our thoughts in the future on that.

25 MR. BROOKMAN: Do you have a sense of the

1 timeframe involved in it?

2 MR. BIXBY: I should be on.

3 MR. BROOKMAN: Do you know the timeframe?

4 MR. BIXBY: No, I don't.

5 MR. BROOKMAN: Okay.

6 MR. BIXBY: But in the near future.

7 MR. BROOKMAN: Okay. Thank you. Jim
8 Crawford and then I'll go to Jim Ranfone.

9 MR. CRAWFORD: The question of figuring the
10 cooling energy savings, if any, that's basically
11 double-dipping. That's already been done in the air
12 conditioning analysis when you -- when you figure --
13 like, if you figure a high -- very high efficiency
14 system the only way you get there is with a very, very
15 low blower fan watt. So, it's already -- it's already
16 been included in one standard-setting and it's totally
17 inappropriate to consider that in a heating products
18 standard.

19 MR. BROOKMAN: Thank you. Cyrus -- let Cyrus
20 follow on and then I'll come back to Jim.

21 MR. NASSERI: I would like to reply to Jim
22 Crawford's -- I don't know if you're trying to say the
23 same thing or not. What we're saying here that when
24 you make the fan more efficient, assuming that the
25 furnace at the present time does not have the high

1 efficiency motor, and traditionally, the same fan in
2 the home -- typical home is used for -- for air
3 conditioning and heating. And when we make this --
4 this motor more efficient, this fan -- circulating fan
5 more efficient, obviously that air conditioning cycle,
6 whatever the seasonal basis, would get a benefit out of
7 being a more efficient fan. And that's the part we're
8 talking about.

9 MR. BROOKMAN: Jim Crawford?

10 MR. CRAWFORD: Jim Crawford. It -- it is my
11 contention that that is -- that benefit has already
12 been accounted for in the air conditioning standards-
13 setting and what you're trying to do is to count that
14 one benefit -- cooling season benefit in both seasons.
15 And that's -- that's double-dipping of the worst kind.

16 MR. SACHS: Can we have a follow-up?

17 MR. BROOKMAN: Sure, Harvey. Go ahead.

18 MR. SACHS: Jim, just -- Harvey Sachs. Just
19 for the record, I -- since the air conditioner is,
20 except in the heat pump case, sold separately from the
21 furnace, are you maintaining that there's the double-
22 dipping through a high default penalty on the air
23 conditioner test cycle? I'm not -- not following where
24 the double-dipping is coming from.

25 MR. CRAWFORD: Talking about --

1 MR. BROOKMAN: Go ahead, Jim.

2 MR. CRAWFORD: I'm talking about the double-
3 dipping in -- in -- it's an analytical double-dipping
4 in the setting of air conditioning standards when you
5 consider the -- the cost of operation. When you
6 consider the cost of operation, and I'm going to pick a
7 number, of a 15 SEER system, you don't get there
8 without this air -- without this electronic blower,
9 whether it's on a furnace or an air handler. You don't
10 get there without it. So -- so, we should probably --
11 by this kind of reckoning, we should have considered
12 the heating benefit of that.

13 MR. BROOKMAN: Harvey, go ahead. Keep going.

14 MR. SACHS: I -- again, it's my unfamiliarity
15 for which I'm embarrassed, but it seems to me that we
16 have a set of defaults in the air conditioning test
17 procedure which amount to an assumed -- assumed
18 parasitic for the fan. And I don't see how that varies
19 with the SEER of the unit in a way that would encourage
20 a more efficient fan that would then be coupled to the
21 furnace specification to require it be actually in
22 place.

23 MR. CRAWFORD: Let me go way out on a limb on
24 this one. I think I can almost guarantee that if
25 you're at a 15 SEER that number was not derived with

1 default watts.

2 MR. SACHS: In that case, the consumer is
3 perhaps by -- if I'm inferring correctly from you, not
4 receiving a SEER 15 unit if it's installed with a
5 conventional PSC motor in the furnace to which it's
6 coupled, so that in fact we have a -- a serious defect
7 in the air conditioner standard.

8 MR. CRAWFORD: Nice try. But --

9 MR. SACHS: I'm just --

10 MR. CRAWFORD: -- if he buys -- many of the
11 -- any of the reputable manufacturers, all of whom are
12 report -- represented here today, when he buys that he
13 gets that ECM one way or another.

14 MR. BROOKMAN: Yes. Dan, go ahead.

15 MR. DEMPSEY: Dan Dempsey, Carrier.

16 Maybe I can clarify a little bit. He may
17 have a -- an air conditioner that's a rated 12 SEER
18 using defaults and then that same air conditioner when
19 applied with the variable speed blower, such as in a --
20 a high-end furnace, appears as a different rating in
21 our directory. So, it would be rated specifically with
22 that match, at a 13 SEER level, for instance. So --
23 so, the benefit in the cooling box is being
24 incorporated into the air conditioning SEER. And so, I
25 agree with Jim in that trying to further add the

1 cooling benefit into the heating analysis is double-
2 dipping.

3 MR. SACHS: Well, I very much appreciate
4 that. It does seem to me that between the -- the
5 directory and the -- the dealers' activities there are
6 some pretty large gaps. But I think as we proceed our
7 position will be that we don't need to include the
8 cooling -- cooling benefits.

9 MR. BROOKMAN: Yeah. We'll get some more of
10 that. That last commentor was Harvey Sachs. Michael
11 Martin?

12 MR. MARTIN: Yeah, I'm very confused by this
13 term "double-dipping" because I think we're talking
14 about two things at once here, as a lot of the time we
15 are.

16 One question is whether there should be a
17 minimum requirement and the other question is how much
18 credit you -- you use in your cost effectiveness
19 calculations. And having a minimum requirement makes
20 very good sense to me. You do have to be careful in
21 the calculations as to where you give the credit for
22 it, but I certainly would agree with Jim that we -- we
23 need to include a requirement for electrical use. And
24 I -- I prefer the way it's looked at here rather than
25 doing anything that changes the definition of an AFUE.

1 MR. BROOKMAN: Uh huh. George, did you wish
2 to -- please state your full name, George.

3 MR. KUSTERER: Excuse me. George Kusterer, a
4 concerned citizen.

5 I'm just an ignorant farm boy from
6 Pennsylvania and double-dipping in my neck of the woods
7 has a whole different meaning.

8 (Laughter)

9 MR. KUSTERER: However -- no, skinny-dipping
10 is something that the Californians do a lot.

11 (Laughter)

12 MR. KUSTERER: Especially when they have an
13 energy crisis.

14 (Laughter)

15 PARTICIPANT: Talk about -- double-dipping.

16 MR. KUSTERER: I don't want even to go there.

17 (Laughter)

18 MR. KUSTERER: My concern is -- is the
19 Department of Energy assuming that every furnace
20 manufactured here in the United States is going to be
21 hooked to an air conditioner. I think we should be
22 dealing with the heating load and kind of let the
23 cooling load do its own thing. I think we're wasting a
24 lot of time on cooling issues when we can assume that
25 every furnace manufactured today is going to be hooked

1 to an air conditioner.

2 MR. McMAHON: If I could respond to that.
3 No, George, we're not assuming that all furnaces are
4 hooked to air conditioners. We are assuming that a
5 substantial furnace -- portion of furnaces are hooked
6 to air conditioners. And in that case, it's the same
7 fan and blower motor that's being used in the heating
8 season as well as the cooling season.

9 MR. KUSTERER: But that should be another
10 issue. We're dealing with a heating issue here.

11 MR. BROOKMAN: Let's -- that last commentor
12 was Jim McMahon. And did I see -- yes, go ahead,
13 David. And then I'll go over to Jim. Thank you for
14 being patient. This is all the same stream of issues,
15 it seems to me.

16 MR. BIXBY: Regard -- David Bixby with GAMA.

17 Regarding electricity use for boilers, the
18 primary use of electricity is through pumps. And not
19 all manufacturers supply a pump with a boiler.
20 Sometimes the pumps are installed in the field.
21 Sometimes they're supplied by the boiler manufacturers,
22 so GAMA does not believe that DOE should be looking at
23 electricity use for boilers for that reason.

24 MR. BROOKMAN: Okay. Thank you. Jim
25 Ranfone. Thank you for being patient.

1 MR. RANFONE: Yeah. Jim Ranfone, AGA.

2 I just want to follow up what I spoke about a
3 little bit this morning. But first of all, before we
4 even get there, I'm -- I'm trying to figure out what --
5 has DOE taken a look at this from a legal authority in
6 making a determination that it's going to establish
7 some kind of a new minimum or recognition of an energy
8 -- electrical energy consumption from fossil fuel
9 outside the AFUE? I mean we talked about energy
10 descriptors but I think what I saw in the screening
11 document was establishing some kind of a maximum
12 electrical usage on a piece of equipment as a -- as a
13 methodology.

14 By the way, we support reducing the
15 electrical consumption, certainly, from fossil fuel.
16 We -- we'd like to see more efficient motors and
17 blowers on that product so we're not opposed to that.

18 But legally what is DOE's role in this? Are
19 you going to attempt to, you know, to establish a
20 minimum that's going to be enforceable by DOE? Does
21 the statute allow you to do that? Since it's going to
22 be a different energy descriptor --

23 (The proceedings were interrupted by the
24 ringing of a telephone.)

25 MR. RANFONE: Somebody better answer that.

1 The second issue I have is if indeed you are
2 looking at electrical consumption and reducing it, why
3 wouldn't you look at other product classes and, in this
4 case, electric resistance heating? If you want to
5 improve motors and you -- as part of your -- your
6 charge here to do that, why isn't that being considered
7 as part of this product class?

8 So, when we talk about product classes
9 earlier today, when we did, I brought that up and I
10 want to reiterate that if you're going to look at
11 mandating or coming up with some kind of way of -- of
12 minimizing electrical consumption, you've got to do
13 this across the board for all the products. And
14 secondly, statutorily, can you do that? Is there --
15 are you going to have an enforcement? Are
16 manufacturers going to have to supply information to
17 the Federal Trade Commission verifying that they've run
18 a sampling plan, that the electrical consumption for
19 this product doesn't meet or exceed, or is it going to
20 be a different energy descriptor that's different than
21 what's in the law? And those are the kinds of factors
22 that -- that I'd like to get some response to. And
23 then secondly, you know, we'll follow up in our written
24 comments.

25 MR. MARGOLIS: Eugene Margolis, Department of

1 Energy.

2 MR. BROOKMAN: Eugene, you need to come to
3 the mike, please.

4 (Pause)

5 MR. MARGOLIS: Eugene Margolis, Department of
6 Energy.

7 Yes, we are looking at this and we -- I mean
8 we are looking at it very seriously to come up with a
9 -- for all energy usage. AFUE is one part and then
10 there's the fan motors as another part. How we can
11 combine them together, if we can combine them, is under
12 serious consideration.

13 But you must remember we have a motors
14 portion of -- of a -- of a rule and under the motors we
15 -- which says it's -- can be -- for a motor or for a
16 motor in usage with another part that that motor for --
17 can be made much -- can be made more efficient in its
18 application to furnaces and boilers. And so, we are
19 looking at this from both points of view.

20 MR. RANFONE: Jim Ranfone. Just to follow
21 up, and so -- but under the motor rulemaking, that
22 would be a separate rulemaking than --

23 MR. MARGOLIS: Yes.

24 MR. RANFONE: -- what we're talking about
25 here. What we're saying here, you've got a complete

1 packaged product here that has electrical features to
2 it and you're also looking at it from the aspects of
3 the motor rule, small -- what's the -- what kind of
4 process do you have for motors? Is it similar to this?
5 Do you have to do an economic analysis?

6 MR. MARGOLIS: Yes.

7 MR. RANFONE: Okay. Technology feasible --

8 MR. MARGOLIS: Feasible.

9 MR. RANFONE: Okay.

10 MR. BROOKMAN: Okay. Jim, yes?

11 MR. RANFONE: On the product class issue.

12 MR. BROOKMAN: Yes.

13 MR. RANFONE: We were suggesting that since
14 electric resistance furnaces are included in this
15 rulemaking that the Department in looking at electrical
16 consumption or improving motors that that product class
17 should also be considered.

18 MR. MARGOLIS: Well, electric resistance
19 motor -- I mean furnaces is, what, 98, 99 percent
20 efficient. And so, what we're looking at there is what
21 would be the fan usage.

22 MR. RANFONE: Right.

23 MR. MARGOLIS: And therefore, would the fan
24 usage take down the 98, 99 percent deficient electric
25 resistance furnaces down to a level of what? 78

1 percent or 80 percent.

2 MR. RANFONE: Jim Ranfone, AGA.

3 But if you're looking at -- according to the
4 way your framework document establishing a maximum
5 electrical consumption for electrical motors, that
6 should also apply to electric furnaces. That's the
7 point I'm trying to make here. If you want to improve
8 motors across the board, then that should also apply to
9 other product classes that aren't being considered.

10 MR. MARGOLIS: Yes.

11 MR. RANFONE: Because we're talking about a
12 half a million electric resistance furnaces shipped
13 each year. That's our estimate.

14 MR. BROOKMAN: Several people are in the
15 queue. Michael Martin, Harvey, and then Jim.

16 MR. MARTIN: Yes. We agree with Jim that if
17 you're going to improve motors you need to improve all
18 motors related to furnaces and boilers. We also feel -
19 -

20 MR. BROOKMAN: Louder, please.

21 MR. MARTIN: We also believe that DOE does
22 have the authority to set the standards. And as Jim
23 pointed out, the possible level -- the possible measure
24 of -- of performance -- electrical performance is
25 already in the test method, so DOE -- DOE is not

1 allowed to set the standard without a test method and
2 they -- but they have a test method. And we believe
3 that it is well within DOE's authority to set this
4 standard.

5 MR. BROOKMAN: Okay. Thank you. Harvey?

6 MR. SACHS: I would -- let me start one step
7 back. I recently joined ACEEE and one of the early
8 things I did was review some of the things we
9 published. And thanks to GAMA we've been able to
10 publish a document called "America's Most Efficient
11 Appliances," which includes the listings for gas
12 furnaces.

13 There's a rather striking thing that because
14 it includes the electricity consumption on the AFUE
15 cycle you see immediately that there are on the market
16 today two classes of gas furnaces, those which seem to
17 have PSC motors and those which seem to have ECM
18 motors. The difference in energy consumption by -- by
19 size class of course varies but it can range anywhere
20 from 600 to 1000 KWH per year. It's a very large
21 number. We believe that energy savings of that
22 potential magnitude, if cost effective, should be
23 addressed. We believe that DOE has the legal authority
24 to do so.

25 We believe that AGA's concerns in part can be

1 addressed by not looking at the need to do size --
2 size-specific maximum electricity consumption but
3 instead giving the manufacturers the incentive to look
4 at all parts of the air handling system by establishing
5 a maximum watts-per-CFM criterion against realistic
6 static pressures for the system. And target numbers
7 would be in the range of .1 watt-per-CFM, which should
8 allow a fair amount of experimentation in terms of fan
9 design as well as -- well as motor specification.

10 MR. BROOKMAN: Do you want to follow on, Dan?
11 And then I'll -- I'll go to Jim next.

12 MR. DEMPSEY: Dan Dempsey with Carrier.

13 I just wanted to respond to Harvey's comment
14 about some of the products that appear in our
15 directory. To my knowledge, the vast majority of those
16 products that have the high efficiency motors are also
17 two-stage combustion products. So, you know, don't be
18 misled by the numbers. There's additional complexity
19 in the product that allows the motors to operate at
20 higher efficiencies.

21 On a straight match basis swapping standard
22 technology motor for the high efficiency motors, at
23 full speed you don't generate an enormous amount of
24 electrical energy savings. So, you'll need to take a
25 look at that just to see if -- if the -- the reductions

1 in energy are justified by the cost --

2 MR. SACHS: Sir, I very much appreciate that.

3 MR. BROOKMAN: This is Harvey speaking.

4 MR. SACHS: What I'm trying to do is first of
5 all preserve your freedom to specify different size air
6 handlers with different regional models so you can take
7 that same 75,000 Btu-per-hour furnace and sell it with
8 the equivalent of a five-ton air handler in the south
9 and a three-ton in the north. And CFM-per-ton -- CF --
10 watts-per-CFM is the only way I know to preserve a
11 performance specification that gives you as the
12 manufacturer the freedom to do it the way you want to.

13 Secondly, it is my understanding, and please
14 correct me if I'm wrong, that even though the ECM
15 motors are somewhat more efficient at high speed than
16 the PSC motors, their real advantage is that part load
17 and in most of the country, as I understand it, we're
18 reserving the high-speed fan function for the cooling
19 season and running a more moderate speed because of the
20 greater Delta T in the heating season. So, if
21 anything, the ECM motor by your logic should have even
22 more savings. And I've tried to approximate that by
23 using the numbers from the AFUE test.

24 MR. BROOKMAN: Do you have any follow-up?

25 MR. DEMPSEY: If I may follow-up? This is

1 Dan Dempsey, Carrier.

2 That's why to -- to capture the benefits of
3 the motor we run with two-stage combustion, so that the
4 motors run at even lower speeds than they would
5 normally run at normal heat -- than in normal heating
6 operation. So, yes, in the cooling mode very little
7 difference when you're running at full speed. At
8 single stage heating mode there is some benefit but it
9 is not as substantial as what you see currently in our
10 ratings, which are predominantly two-stage combustion
11 products where they run at a much even -- a much lower
12 speed.

13 MR. SACHS: I'd like to do just one final
14 follow-up on this. The written comments will provide -
15 - do suggest that this should be done at full speed and
16 at 50 percent of rated speed for the fan in terms of
17 the -- the -- I don't want to say certification, the
18 requirements for certain watts-per-CFM. And that also
19 tends to differentially impact the ECMs and the PSCs,
20 as I understand the situation.

21 MR. DEMPSEY: And one last comment I was
22 going to --

23 MR. BROOKMAN: Go ahead, Dan.

24 MR. DEMPSEY: -- make when I first started
25 speaking. There was also discussion about rating at

1 some reasonable static. And one of our comments would
2 be that our market is changing due to the focus on
3 tight duct systems and the focus on higher efficiency
4 filtration. The static requirements in our industry is
5 increasing. So, even though we may be able to look at
6 it on a watts-per-CFM, there's still a question mark as
7 to what static is that assuming.

8 MR. SACHS: We agree entirely.

9 MR. BROOKMAN: Jim, since Harvey's comments
10 cued off GAMA data I wanted to recognize Joe and then
11 I'll return to you. Joe Mattingly.

12 MR. MATTINGLY: I apologize for being late.

13

14 I just heard a couple people mention that --
15 something about they believe that DOE does have the
16 legal authority to address electrical consumption of
17 furnaces. And since I got here late, did someone say
18 they didn't?

19 MR. NASSERI: No. Jim Ranfone asked that
20 question.

21 MR. MATTINGLY: Oh. Okay. All right.

22 MR. BROOKMAN: Okay. Thank you. Thank you,
23 Jim Crawford, for being patient.

24 MR. CRAWFORD: Jim Crawford, and I want to
25 step back, also. The electric furnaces, a red herring

1 has been dragged across the trail here a couple times
2 and I want to make just one point about electric
3 furnaces. I don't care how efficient that fan motor
4 looks as a motor. As part of an electric furnace it's
5 100 percent efficient. It's 100 percent efficient.
6 Every watt of electricity that goes into that sucker
7 turns into heat one way or another. So don't get
8 wrapped around fan motors on electric furnaces.

9 MR. SACHS: That's why I want watts-per-CFM.

10 MR. CRAWFORD: Second point. But it doesn't
11 make any difference. It winds up being heat. If it's
12 -- if -- if your heat source is electric -- electrical
13 -- you know, you're chasing yourself around a circle.

14 MR. SACHS: Doesn't that also happen to the
15 gas and electric?

16 MR. BROOKMAN: Just a second. Wait. With
17 these sidebars, unless they're on the record they're
18 not going to be captured. Keep going, Jim.

19 MR. CRAWFORD: Second, there seemed to be
20 some -- some lack of understanding in some of the
21 hinterlands about what "double-dip" means, so let me
22 make it even clearer.

23 (Laughter)

24 MR. CRAWFORD: Let's talk about continuous
25 dip. If you run a fan in a continuous fan mode, which

1 a few people of the deluded do, then you can generate a
2 really big savings on paper from ECM versus a -- an
3 induction motor. But of course, your operating costs
4 are going to go way, way up. Now, I don't think we
5 want to get into that kind of silly nonsense.

6 MR. BROOKMAN: I saw Cyrus -- question.

7 MR. NASSERI: Yes, Jim. I'd like to bring --
8 just clarify the situation related to the issue that
9 you said electric furnace obviously is 100 percent
10 efficient based on site operation. But my question is
11 if you have two electric furnaces, one with regular
12 motor to distribute the fan -- I mean the air to the
13 house and the other one with a high efficiency motor,
14 what would be the -- the annual fuel -- electricity
15 consumption of these? Are there any difference between
16 these two furnaces based on that?

17 MR. CRAWFORD: They are identical. The one
18 with the inefficient motor will run a little bit less.
19 It'll burn a little bit more power while it runs and
20 it'll run a little bit less, but the annual power
21 consumption is identical with -- with the same
22 thermostatic control. Identical.

23 MR. BROOKMAN: Other comments on this
24 subject? Carl Adams. And then I want to turn back to
25 Jim McMahon to keep going with his slides.

1 MR. ADAMS: Carl Adams. I just wanted to
2 make sure -- sort of clarify one point, I guess, in
3 that many of you remember that several years ago DOE
4 went down the road of trying to combine the AFUE and
5 the electrical consumption. And as I've told a couple
6 people, we got our fingers burnt up to our elbows
7 trying to do that. And so, this -- this time what
8 we're talking about is keeping them separate. So, the
9 AFUE part would stay the AFUE part and the electrical
10 consumption, however we would deal with it, would be
11 dealt with as a -- as a separate, independent part of
12 the standard.

13 MR. RANFONE: Yeah, this is Jim Ranfone.
14 That was my original question. Were you going to try
15 to combine it --

16 MR. ADAMS: No.

17 MR. RANFONE: -- like you did before?

18 MR. ADAMS: No.

19 MR. RANFONE: Which --

20 MR. ADAMS: We're not thinking that way.

21 MR. RANFONE: Okay. And the other issue
22 about the electrical usage, I mean I just have to
23 disagree. If you are required to label electric
24 furnaces under the test procedure you're going to come
25 up with a different number based on the calculations.

1 It's in the DOE --

2 MR. CRAWFORD: Well, the laws --

3 MR. BROOKMAN: This is Jim Crawford. Go
4 ahead.

5 MR. CRAWFORD: Excuse me. The laws of
6 physics don't know for sure about that calculation.
7 But the fact remains is every watt that goes into an
8 electric furnace comes out as heat. Now, it may come
9 out through the cabinet if there's a little bit of
10 cabinet loss. But 100 percent comes out as heat and it
11 doesn't matter whether it goes to the strip heaters, to
12 the controls, to the motor blow -- blower motor, or
13 where it goes.

14 MR. MARRAN: Jim Marran from the AGA.

15 If that's the case, then the same electric
16 energy that comes out from heat from the fossil fuel
17 goes into the heated space and therefore shouldn't be
18 accounted for and we shouldn't be having this
19 discussion.

20 MR. BROOKMAN: Let's go to Jim Mullen and
21 then -- and then, okay, and then David, and then I'm
22 going back to Jim McMahon to keep going with his
23 slides. Jim?

24 MR. MULLEN: Okay. Jim Mullen with Lennox.
25 Just -- just a reminder that there are a lot

1 of things buried in that EAE number. And before
2 somebody goes to the GAMA digest and starts comparing
3 numbers like they were all really blower watts at an
4 equal test condition, they aren't. There are different
5 statics hidden in there. There are in some cases I
6 think even run motors under voltage to get the right
7 test condition. And so, just a word of caution and a
8 comment that it deserves some real study to make sure
9 everybody understands what's in that number.

10 MR. BROOKMAN: That's useful. I'm sure the
11 Department appreciates that. David?

12 MR. BIXBY: David Bixby, GAMA.

13 Yeah, we were looking at that the other day
14 in the directory and it was raising more questions than
15 answers, so it's a very complex subject and GAMA has a
16 task group that's studying this.

17 One final thing I'd like to say is DOE posed
18 a question whether it should specify a maximum annual
19 electrical consumption that would vary by the rated
20 output of the equipment and we would like DOE to
21 clarify whether they really meant input versus output.

22 MR. BROOKMAN: Thank you. Jim McMahon, keep
23 us going.

24 MR. McMAHON: That's actually the end of the
25 presentation on --

1 (Laughter)

2 MR. BROOKMAN: I thought you were going to --

3 MR. McMAHON: There are two backup slides
4 which were there in case of questions. I think we've
5 covered the material in there and don't need to --

6 MR. BROOKMAN: Okay.

7 MR. McMAHON: -- dwell on them unless there's
8 a question.

9 (Slide)

10 MR. BROOKMAN: I wanted to make sure we
11 finished on those before we finished these questions.

12 Go ahead, Dan.

13 MR. DEMPSEY: I just -- Dan Dempsey, Carrier.

14 In your backup slide, just wanted to make the
15 comment about the power consumption assumed for the PSC
16 motor as compared to the ECM DC motors.

17 MR. BROOKMAN: Yes.

18 MR. DEMPSEY: I think your PSC motor numbers
19 are high based on your reference and the ECM motors are
20 probably low based on your reference in a straight
21 match situation.

22 MR. McMAHON: Okay. We're citing someone
23 else's study, but if you would like to in your written
24 comments tell us what you think the correct values are,
25 we'd appreciate that.

1 MR. BROOKMAN: Other comments on this series
2 of slides? Jim Crawford?

3 MR. CRAWFORD: Just on that same chart -- Jim
4 Crawford -- same chart, the use of backward curved
5 blades has nothing to do with the fan motor and DOE has
6 been dragging this one out now about three times a year
7 for the last 20 years. The first one has not seen its
8 way into a residential furnace or air conditioner I
9 don't believe except perhaps in induction fans. But as
10 far as the air moving -- the principal air moving fan
11 -- and the reason is because they have to run at high
12 speeds, they're very noisy.

13 MR. McMAHON: Thank you.

14 MR. BROOKMAN: Other comments?

15 MR. NASSERI: I have final --

16 MR. BROOKMAN: Cyrus, yes.

17 MR. NASSERI: -- final words for the people
18 to -- to comment to us during this comment period of
19 one month. As we discussed electricity usage of
20 furnaces, we would like to basically see what it is and
21 obviously some static pressure, some CFM issues came to
22 the -- that Harvey mentioned and none of those
23 functions are basically measurable by -- by test
24 procedure.

25 The only thing that I would like to -- to

1 bring to attention for maybe thinking for the
2 manufacturers and other participants here is maybe we
3 can base this consumption of energy -- annual
4 consumption maybe per -- per Btu. In other words,
5 let's say that we have so many watts per Btu and if
6 we'd be able to narrow this down to a unit energy in
7 that fashion, which is -- to me it looks like is
8 achievable by looking at some of the data that
9 California Energy Commission put on their -- on their
10 directory also, probably the same type of thing, and
11 GAMA or vice versa.

12 And we basically would like to -- to ask the
13 question and propose it to the -- to everybody that
14 maybe in that fashion of looking at those consumption
15 per size of -- input size of these furnaces what they
16 are and maybe some empirical equation could be
17 developed based on that. And maybe that empirical
18 equation which would be probably one line per
19 efficiency level might be something that could be
20 basically required as a maximum consumption for these
21 furnaces during this rulemaking.

22 MR. BROOKMAN: Harvey?

23 MR. SACHS: Carl Adams remind -- this is
24 Harvey Sachs again. Carl Adams reminds me that the
25 present standards and test procedure are a little bit

1 insensitive. But on the other hand, the ARI test
2 procedures for heat pumps do, as I recall, include
3 measurements of air flow at static. There are methods
4 for measuring wattage. I believe the ARI -- please,
5 this is subjective -- is based on an ASARAE standard
6 and thus would have some protected status in parts of
7 the DOE procedures. I don't know if it comes back to
8 NACR just in terms of the codes. So, it certainly is
9 not a -- not an enormous Newtonian exercise in
10 intellectual activity to develop a standard based on
11 watts-per-CFM at stipulated static pressures.

12 MR. NASSERI: Answering Harvey, no, Harvey.
13 It's not possible at this point because the test
14 procedure does not -- test -- DOE test procedures. We
15 cannot achieve something like that. And we cannot --
16 either -- neither with a static pressure per static per
17 inch of whatever or per CFM. Obviously, that was ideal
18 situation if we could done that.

19 But I said if you turn it around and then
20 mentality should be to do it per Btu, which is the
21 input size of these furnaces. That to me is achievable
22 by empirical equation and I thought -- I made some
23 attempt myself, you know, to look at this. I haven't
24 really proposed it to a National Institute of Standard
25 Technology who are usually doing the test procedure for

1 us yet, but this is what I -- I get out of the test
2 procedures at the present time.

3 MR. BROOKMAN: Harvey, I'm sure the
4 Department would welcome your thoughts on how this
5 could be developed in writing. And that would make --

6 MR. SACHS: I look forward to working with
7 the Department on that.

8 MR. BROOKMAN: That would make it very clear
9 and then you could have this exchange. I think that'd
10 be -- I'd get that accomplished.

11 Dan?

12 MR. DEMPSEY: Dan Dempsey, Carrier.

13 Cyrus, we've been looking at it also, and if
14 every furnace had a three-ton air mover that would be a
15 way to consider it. Unfortunately, it falls down when
16 you take and look at a 75,000 Btu furnace and look at
17 the watts for the unit with the three-ton air mover,
18 then the version that has the four-ton air mover, and
19 then the version that has the five-ton air mover.
20 There you see a great variation in the electrical
21 consumption, so somehow if you're going to consider
22 that the AC air flow is a key variable in the whole
23 equation.

24 MR. NASSERI: We are aware of that, Dan, and
25 that's one of the reasons we said the cooling fact of,

1 you know, making these motors more efficient -- we can
2 come up with that. And again, it's -- maybe we are
3 able to gather enough data statistic from the
4 manufacturers of how many of these furnaces, if they
5 can provide it to us, going out of the plant with --
6 being -- matching to certain tonnage of air
7 conditioner. If that is possible or if we can find out
8 because some -- sometimes these furnaces are basically
9 matched with a condenser or evaporator which goes with
10 that furnace. So, if that's something we can -- this
11 is -- I'm just proposing that we look at this -- these
12 scenarios and for us to gather this information and see
13 if there is such a -- you know, some kind of a linear
14 relationship or some kind of empirical equation could
15 be developed that Department can regulate electricity
16 consumption based on that.

17 MR. BROOKMAN: So, thanks for those comments,
18 Dan.

19 Final comment from Jim and then I'd like to
20 move us toward life cycle cost analysis.

21 MR. CRAWFORD: The -- Jim Crawford. The
22 proposal has been made that maybe one ought to look at
23 the power consumption for Btu. If one had a 500
24 kilowatt-hour electrical consumption for the motor in a
25 year and had about 2000 hours of a 100,000 Btu-per-hour

1 furnace, it looks like you'd probably be consuming
2 about two and a half miliwatts per Btu. I think we're
3 hunting butterflies with buckshot here.

4 MR. BROOKMAN: Okay. Thank you for that
5 metaphor.

6 Life cycle -- let's go on to life cycle cost
7 analysis and we can -- we can talk about some of these
8 metaphors at the break.

9 (Pause)

10 MR. BROOKMAN: Jim -- Jim McMahon.

11 D. Life Cycle Cost Analysis

12 MR. McMAHON: Okay. We're going to make a
13 shift here in two dimensions basically. One is so far
14 today we've been talking primarily about technologies,
15 technology characteristics, cost, and so forth. But
16 technology. We're now moving farther down into the
17 analysis and we start to think about the impact of a
18 standard if a amended standard is set and the different
19 perspectives of that -- of those impacts.

20 The first perspective we're going to talk
21 about today is the consumer perspective, so I would
22 like you to shift your attention from the technologies
23 toward a consumer perspective. Think, if you will, of
24 an individual homeowner dealing with a purchase of a
25 new furnace and what the implications are --

1 MR. BROOKMAN: Jim, excuse me for a second.
2 We have -- we have to really hold down the sidebars
3 here, folks, so Jim can proceed.

4 Okay. Now, please.

5 MR. McMAHON: If you think of an individual
6 consumer at some point in the future after the new
7 standard thinking about purchasing a furnace, how would
8 they be affected differently if there is or is not a
9 new standard? So, we want to put those two parallel
10 features out there and think about them.

11 (Slide)

12 MR. McMAHON: Now, why do we worry about life
13 cycle costs at all? The reason is that the legislation
14 requires it as one of the measures of economic
15 justification. Specifically, it doesn't mention life
16 cycle cost specifically but it mentions that savings
17 and operating costs through the life of the covered
18 product compared to an increase in the price of or
19 initial charges for or maintenance expenses of the
20 covered products likely to result from the imposition
21 of standards.

22 (Slide)

23 MR. McMAHON: The method that has been
24 adopted and has been used for all rulemakings to date
25 is to look at life cycle cost because that includes all

1 of those aspects. The consumer faces initial costs to
2 purchase and have the equipment installed and then
3 operating costs over the life.

4 The life cycle cost takes the sum over the
5 life of the equipment of all those costs and it
6 discounts future values to the present.

7 The second major bullet here shows an
8 equation. Life cycle cost is the sum of "P" for price
9 that -- which includes installation costs, and "O,"
10 operating expenses summed over years where the years
11 represent the lifetime of the equipment and the small
12 "r" there indicates the discount rate.

13 (Slide)

14 MR. McMAHON: Now, I'm going to pose some
15 questions here that I'd like you to keep in mind, then
16 I will proceed with the presentation that will kind of
17 inform some of these questions a little better. Then
18 we'll take your input.

19 The first question is are the proposed
20 approaches reasonable? You haven't seen them yet, so
21 keep that in mind.

22 We do want to look at regional variations.
23 There was an earlier discussion this morning about why
24 that's important. The question that we would like you
25 to consider is whether it's important to consider that

1 early on in analysis before the advance notice or if
2 it's all right to do that later. That is, do the first
3 analysis based upon national assumptions and then
4 refine that analysis later or do you want to see the
5 regional detail in the first round?

6 Third bullet, are the proposed data sources
7 reasonable. I'll show you what those are.

8 And finally, should the equipment lifetimes
9 depend upon other factors? Specifically, does the
10 lifetime of a furnace depend upon the operating hours
11 per year? Does it depend upon the climate or other
12 application-specific variables? Should the lifetimes
13 be the same for all the product classes of furnaces or
14 for all the product classes of boilers. The -- the
15 motivation for that question is at this point we don't
16 have highly disaggregate lifetime data. We have
17 aggregate averages and we would like your knowledge and
18 intuition about whether we need to seek more detail.

19 (Slide)

20 MR. McMAHON: So let's step through the
21 process. The first input is what we call installed
22 owner cost. That includes the price paid for a furnace
23 or boiler, including installation. We're thinking of
24 an individual consumer here, whether it's replacement
25 or new construction. And we understand that those are

1 different.

2 Possible data sources for some of the
3 information we need are surveys of current or recent
4 purchase prices, and we've had comments about whether
5 that's worthwhile or not this morning. Or calculations
6 from manufacturer costs plus markups where we include
7 such things as sales tax and installation costs.

8 (Slide)

9 MR. McMAHON: The next set of inputs involve
10 the operating expenses. We are concerned about both
11 energy and maintenance costs. When we think about
12 these on an annual basis we then want the lifetime. We
13 would actually like the distribution of lifetimes based
14 by a population of furnaces or boilers. And the
15 discount rate for calculating the present value. We
16 have developed discount rates for other products in the
17 past and if you would like to base your comments on
18 those, that would be great.

19 A possible approach is to get the annual
20 energy consumption by furnace or boiler from recent EIA
21 surveys. I have in mind there the RES survey, the most
22 recent of which is the 1997. That's the methodology
23 that was used for water heaters recently. Or to do
24 simulations to account for building construction and so
25 forth to get those.

1 For our energy prices, we can certainly get
2 current energy prices now we're in the wonderful world
3 of forecasting. There were a number of good comments
4 made this morning about how difficult and important it
5 is to make these estimates for the year in the future
6 when the standards are effective, so we may be talking
7 about the year 2012 here.

8 This is what I've done for a lot of years and
9 I'll tell you what one of my bosses told me years ago,
10 which is I'm always wrong. Making forecasts is a
11 hazardous business. I don't claim to know what's going
12 to happen in the future, but as Jim Crawford commented
13 earlier, we hope to get in the ballpark with a
14 sufficiently good answer, recognizing that it's
15 uncertain, that will provide a basis for a sound policy
16 on behalf of the Department.

17 Our methodology has been to get current
18 prices, consider the fact that they are different in
19 different regions of the country, and then to take
20 forecasts. We have typically relied upon DOE's
21 official forecast, the Energy Information
22 Administration Annual Energy Outlook, but we are open
23 to using other forecasts. If you have any suggestions,
24 please let us know. And then we apply those to
25 marginal prices.

1 Marginal prices are important because we're
2 concerned about the incremental impact on the consumer
3 and so that's -- that's why that's done.

4 Finally, we need data on lifetimes and on
5 discount rates.

6 (Slide)

7 MR. McMAHON: Now, this is an illustrative
8 example. As in another example this morning, there are
9 no numbers here. It's just to give you the concepts.
10 The Department is going to look at a range of
11 efficiencies compared to a baseline. The baseline
12 furnace or boiler will have some amount of installed
13 costs and over its lifetime discounted and summed up,
14 some amount of operating and maintenance costs. The
15 total is the life cycle cost. The Department will then
16 consider alternatives to the current baseline that are
17 different efficiency levels.

18 Option 1 is one that has a very similar
19 initial cost, installed cost to current furnaces but it
20 has lower operating cost. Presumably, it's slightly
21 more efficient and so it has a lower life cycle cost.

22 Option #2 is the lowest life cycle cost of
23 the bunch. But it has very high installed costs. And
24 the Department will consider situations like that and
25 what the implications are.

1 Option #3 would be one that has a higher life
2 cycle cost and the highest installed cost, and clearly,
3 that's not where the Department wants to go in terms of
4 a standard.

5 (Slide)

6 MR. McMAHON: Now, recognizing how difficult
7 it is to forecast, there's two reasons for that. One
8 is there's an awful lot of variability between one
9 consumer and another. We've alluded to some of them.
10 Consumers live in different climates in the United
11 States. That affects the length of the heating season
12 and how much heat they need. They live in different
13 buildings. Some buildings are tighter than others and
14 they operate their equipment differently. All those
15 things are variability but those can be addressed if we
16 can get the data, at least for the current population,
17 and we have a lot of that data in existing surveys.

18 The other problem is not solvable in an
19 analytical sense, and that is there's uncertainty in
20 estimates, particularly about the future, and what we
21 are trying to do is to bound the uncertainty. So, we
22 would like your input about how good estimates are,
23 whether that's about the cost of the equipment or
24 future energy prices or any of the inputs to this -- to
25 this approach.

1 The technical approach that we plan to use is
2 to use commercially available software so that any of
3 you can replicate our work. We intend to use
4 distributions for each input, not a single value. I
5 think if we were to take a point estimate for any of
6 these assumptions, whether that's the average price of
7 natural gas in the year 2012 or any of the other
8 assumptions, I'm sure you could find fault with any
9 single assumption. However, if we say that we believe
10 that it's some value plus or minus 20 percent, we might
11 find more of you in agreement with that assumption, so
12 that's our approach.

13 The -- all of the inputs and the
14 methodologies will be publicly available on the
15 Internet and in the past the Department has offered
16 training sessions to stakeholders so that you can use
17 the same tools that we use if you'd like to do that to
18 replicate the work or make different assumptions.

19 (Slide)

20 MR. McMAHON: The results of the life cycle
21 cost analysis will be summarized for each possible
22 efficiency improvement. Typical summaries include the
23 average life cycle cost savings or the median if the
24 distribution is not symmetric. Clearly, we will
25 analyze a range of situations to reflect the

1 variability among consumers. And all that information
2 will be available but it's a lot of information and
3 it's often easier to summarize this down and think
4 about the summaries.

5 Another important result is the percent of
6 consumers that will achieve net savings for a given
7 efficiency level. It is not the expectation that a
8 standard level will affect everyone the same, but it is
9 our hope that we can find a new efficiency level that
10 will be beneficial to the vast majority of consumers.
11 In any case, we will analyze the options that are
12 available to the Department and report to the
13 Department and to the public what we think the percent
14 of consumers are that will benefit.

15 Finally, there's something called the
16 importance analysis. The different inputs affect the
17 results differently. And my experience has been that
18 even in very complicated analyses with 60 or 70
19 variables going in as inputs that there are typically
20 three, four, or five variables that are the key
21 drivers. One of those is often energy price. But if
22 you think about any of these problems you'll find that
23 there are a number of variables that even though we
24 will not know them with precision to six digits we can
25 dismiss any further analysis of them as not very

1 important to the final conclusion and focus on the
2 handful of variables that are going to make or break
3 the decision. And so our intention is not to spend any
4 more resource than is necessary to accomplish the
5 analysis, to identify for you and for the Department
6 what the key drivers are, and then deal with those in
7 -- in more detail.

8 So, there are backup slides that I'm not
9 going to go to at this point. I'd like to stop here
10 and ask you to go back a few slides to the questions.
11 Page 3.

12 (Slide)

13 MR. McMAHON: So, is there anyone who'd like
14 to comment on any of the questions that we raised here?

15 MR. BROOKMAN: Bill Prindle?

16 MR. PRINDLE: Thanks, Jim. That was a very
17 complete explanation. And once again, you know, we
18 appreciate the difficulty of the forecasting side of
19 this.

20 I guess a couple of issues that come to mind
21 that might not have come to mind if we'd had this
22 workshop 12 months ago is what do you do with annual
23 energy outlook forecasts that -- that are essentially
24 worth nothing 12 months after they're produced, as
25 we've seen with natural gas prices over the last two

1 years? It seems to me that the recent market
2 conditions somehow have to be reflected both in the
3 baseline marginal price that you calculate and also in
4 the -- in the future variability because I think in the
5 last 15 or 20 years since deregulation has occurred in
6 the energy markets in most cases the market has shown a
7 downward trend, as one would expect.

8 But we've -- we've started to see in recent
9 years that there actually is an upside risk as well
10 that I think has thrown a lot of forecasters for a
11 loop. So I'm suggesting that, you know, you're talking
12 about minimum expected and maximum values. I think
13 that's the way to go. I would suggest that in the last
14 12 months the -- the maximum value in the energy price
15 area has gone up and I don't know exactly what to
16 recommend. One source I would take a look at is the
17 Futures Market which goes out about three years now to
18 get some indication as to where the near-term price
19 trends are going. But I would just say that the events
20 we've seen in the market in the last 12 months indicate
21 to me that there needs to be some allowance for
22 significant price increases as opposed to the general
23 assumption over the last 15, 20 years that prices will
24 always continue to decrease under deregulate market
25 conditions.

1 MR. BROOKMAN: Thank you. Jim Crawford?

2 MR. CRAWFORD: Jim Crawford. I'd like to
3 respond to that a little bit. Although humility is not
4 my most outstanding characteristic, I would certainly
5 defer to the Energy Information Agency for forecasting
6 and I really think that DOE is in kind of a untenable
7 position. If they will not accept the forecasts of
8 their own internal forecasting branch period.

9 MR. BROOKMAN: Thank you. Other comments on
10 these bullets?

11 (Pause)

12 MR. BROOKMAN: Jim Mullen?

13 MR. MULLEN: Jim Mullen. Mine is just a
14 quick comment on the second one about whether or not
15 variations in climate and energy should be looked at in
16 the ANOPR. I think the answer is "yes."

17 MR. BROOKMAN: David or Joe?

18 MR. MATTINGLY: Joe Mattingly from GAMA.
19 Certainly, you -- you -- it's a good thing to
20 do, that kind of analysis, but -- and you certainly
21 wouldn't want to see it in the proposed rule itself.
22 You'd want to see it well before that, either at the
23 ANOPR stage or in some early workshop before -- well
24 before the notebook.

25 MR. BROOKMAN: David?

1 MR. BIXBY: Yeah. I had a comment on the --
2 the equipment lifetimes. GAMA supports as reasonable
3 values seven to -- 17 to 18 years for furnaces and 25
4 years for boilers. However, with regard to the last
5 bullet, as far as application specific variables, a
6 steam boiler manufacturer contacted me indicating that
7 steam boilers are usually not properly operated or well
8 maintained and so therefore the lifetimes are all over
9 the map. And he just threw out a number 10 to 15 years
10 because again if they are properly maintained and
11 operated they can last even longer than 25 years. You
12 can say that about any kind of heating equipment, but
13 again, there are a lot of variables out there that
14 affect the lifetime of the equipment.

15 MR. BROOKMAN: Thank you. Harvey, yes?

16 MR. SACHS: Jim, this is Harvey Sachs.

17 Jim, I'm just pleased that you all are doing
18 what amounts to a sensitivity analysis. It seems to me
19 that there's an interplay between the discount rate and
20 the lifetime. The further out you go, the less -- less
21 it matters how far you go.

22 But the question is really what are you using
23 for sources as data? And I ask that as someone who's
24 been involved in ASARAE 1.8 and don't trust any of the
25 data that's been made available to our committee.

1 MR. McMAHON: Okay. What I'd like to do,
2 rather than give you a long answer is refer you to the
3 DOE Web site for the recent toolmaking, specifically
4 central air conditioners and water heaters. I think
5 central air is the more current one. But in short,
6 what we do is we look at the purchase mechanisms that
7 consumers use. So, for new construction for furnaces,
8 the furnace is paid for usually by a mortgage. And so,
9 we would use mortgage rates for that adjusted for
10 inflation to get a real rate.

11 For replacement decisions we would look at
12 how many are purchased by cash, by credit card, by some
13 other means, and what the appropriate interest rates
14 are for those. And that methodology is totally
15 described.

16 MR. SACHS: I'm sorry. I meant specifically
17 the lifetime information.

18 MR. McMAHON: Oh, the lifetime information?

19 MR. SACHS: Where we've had redesign of most
20 of the products --

21 MR. McMAHON: Right.

22 MR. SACHS: -- so the historical records are
23 --

24 MR. McMAHON: We're asking for help with
25 lifetime information. What we've done in the past is

1 look, for example, at historical shipments prior to
2 determine how many of those are replacements and then
3 use that as a way to back out a lifetime.

4 MR. BROOKMAN: Jim Crawford?

5 MR. CRAWFORD: Jim Crawford. Two points.
6 First, on lifetime, the only thing I would say at the
7 moment is that the addition of electronics to a product
8 will not increase its lifetime. I guess maybe I would
9 also say I think that -- that probably with -- with
10 furnaces -- with the class of furnaces that are all
11 roughly the same probably ought to have one lifetime
12 throughout the country. I don't think you've got the
13 databases that are going to help you do a -- a finer
14 grade of analysis on that.

15 Relative to discount rates, same song, about
16 the 14th verse. And that is that as long as the
17 American consumer is carrying over \$6000 per capita of
18 consumer debt on plastic the effective cost of any
19 incremental expenditure is the cost of plastic because
20 whether they put it on a -- on a mortgage, whether they
21 -- whether they put it on any other form, if they pay
22 that premium that's money that's not available to pay
23 down that plastic debt and that's -- and that plastic
24 debt is accumulating interest at the rate of somewhere
25 between 12 to 16, 18 percent today. And that's the --

1 that's the practical discount rate for this activity.

2 MR. BROOKMAN: Bill Prindle and then to Greg.

3 MR. PRINDLE: A couple of comments. One was
4 I think, Jim, you mentioned the new construction
5 situation where the typical situation is that the
6 homeowner is financing the home with a mortgage. While
7 I think the overall LCC methodology is clearly the way
8 to go, to the extent that there are differences between
9 the new construction market and the replacement market
10 I'd be interested in seeing some -- some cash flow
11 analysis as an additional exercise to find out, you
12 know, does a homeowner who buys a home with the more
13 efficient equipment have positive cash flow in the
14 first year they're in the home or not? We use that
15 kind of analysis quite a bit looking at building codes
16 and similar new construction-oriented kinds of
17 analyses, so I'd be interested in seeing that kind of
18 analysis if it's feasible to do within the overall
19 framework.

20 The other --

21 MR. McMAHON: Bill, a clarification. Are you
22 suggesting -- this is Jim McMahon. Are you suggesting
23 that for new construction or for both new construction
24 and replacement?

25 MR. PRINDLE: For new construction because

1 that's probably not typical in replacements.

2 MR. McMAHON: Okay.

3 MR. PRINDLE: In the replacement market I
4 believe Jim Crawford suggested that -- that a consumer
5 credit interest rate be used as the discount rate. I
6 believe that during the air conditioner negotiations
7 some data was obtained from PG & E and a couple of
8 other sources that provided some indication as to what
9 percentage of replacement devices were purchased on
10 consumer credit versus cash and other -- so I'd
11 encourage the analysis to look at that kind of data to
12 find out exactly what -- what percentage actually does
13 use credit cards.

14 And thirdly, as a -- just as a data point, I
15 have a 9.9 percent Master Card and I just got an offer
16 for an 8.9 percent, if that helps.

17 MR. McMAHON: If I can respond to that. This
18 is Jim McMahan. We have done some research into that
19 for other rules. For example, the question about
20 credit cards. About half of the people who have credit
21 cards have a zero balance on any given month. And so,
22 the question of whether the appropriate marginal rate
23 is the credit card rate is one that's debated by
24 economists, but we -- we are getting some empirical
25 information.

1 MR. CRAWFORD: Jim Crawford again. And I
2 thought that ASE and I were going to be right together
3 on -- on this cash flow. Certainly, we ought to do
4 cash flow analysis and we ought to do it on -- on both
5 new equipment and on replacement.

6 And -- and on -- on the consumer debt, what
7 you're going to wind up showing if you follow down the
8 -- the path that you're headed, Jim, is you're going to
9 say, well, the more affluent people, they -- they pay
10 'em off. But you're really going to sock it to the
11 people who carry that debt and those are the very
12 people who can least afford to -- to buy up with any
13 kind of an upfront expenditure.

14 MR. BROOKMAN: Jim? Pardon me. John. John
15 Marran.

16 MR. MARRAN: John Marran, Energy Kinetics.

17 I think it's interesting. As a marketer of
18 products we say the energy you save is in tax-free
19 dollars because you have to pay for that energy in your
20 income tax before you pay your utility. And so I think
21 there's an adjustment in looking at energy savings as a
22 tax-free return to the owner, which then plays havoc
23 with some of these other numbers, but I think in
24 reality that's a way that's very important to -- to
25 consider.

1 MR. BROOKMAN: Harvey first and then David.

2 MR. SACHS: I'm sitting here with a bunch of
3 people I have an awful lot of respect for and I guess
4 what troubles me a little bit, Jim, is the implied
5 assumption in your analysis is that there is no utility
6 to the consumer other than the efficiency gain. And
7 the cash flow analysis, and for that matter the life
8 cycle analysis, do not discover the amenity values
9 associated with much of the differentiated equipment
10 that your company and some of your competitors are
11 providing. And we could argue logically that part of
12 the cost should be assigned to the improved amenity.

13 And I don't want to get into that kind of
14 theology but I do want to make your point that this is
15 not just a dumb box. It's -- it's providing better
16 function.

17 MR. BROOKMAN: Jim Crawford?

18 MR. CRAWFORD: Jim Crawford. I would -- you
19 know, I -- I'd say you got me on that if we were
20 talking about air conditioning, maybe. But a furnace
21 is by and large a box that delivers hot air. It --
22 it's all sensible heat. We don't have the sensible
23 latent -- latent issue. And I don't believe that we're
24 going to try to -- I hope we're not going to try to
25 monetize amenity values on these activities.

1 PARTICIPANT: Over my dead body.

2 MR. BROOKMAN: Thank you. David, you had a
3 comment?

4 MR. BIXBY: Yeah. I'm sorry if I'm cutting
5 off the economic debate but I had one more comment --

6 (Simultaneous comments)

7 MR. BROOKMAN: David Dixon, is it not?

8 MR. BIXBY: David Bixby, GAMA. I can't
9 balance my checkbook.

10 But one more comment about the lifetime
11 issue. Following up on Jim Crawford's earlier comment,
12 the more complex the equipment gets the more likelihood
13 that the maintenance and repair costs will go up,
14 therefore. And this has been stated by Frank Stanonik
15 earlier that then the consumer has to make a decision,
16 do I spend all that money to repair it or do I just
17 replace it? And that I think we think DOE should
18 consider with respect to how it would affect average
19 lifetime of the equipment.

20 MR. SACHS: Mr. Bixby, I would love to see
21 data on that. I mean I happen to have a '97 car. I've
22 had cars that were substantially older and there
23 certainly are great differences in both complexity and
24 expected lifetime and in operating costs, so I
25 certainly believe that this industry has the

1 capabilities of Detroit.

2 (Laughter)

3 MR. BIXBY: I don't know if that's good or
4 bad.

5 (Laughter)

6 MR. LYNCH: Greg Lynch with Amana.

7 MR. BROOKMAN: Greg. Thank you.

8 MR. LYNCH: David Bixby actually phrased most
9 of what I wanted to get back to again on. And I don't
10 know how to suggest doing it as far as separating. I
11 know that it -- just for purposes of this -- this
12 discussion you had operating costs and maintenance
13 costs together. I don't know if it's possible. It'd
14 be certainly a challenge for you to be able to separate
15 those, but they -- they are -- they have a different
16 impact and the more efficient equipment, as -- as Jim
17 mentioned, the electronics don't make things live
18 longer.

19 But as equipment gets more efficient they're
20 going to be more complex. There'll probably be more
21 embedded electronics and/or other designs that are more
22 complex that certainly are going to -- from my own
23 experience require higher maintenance and service costs
24 that will then drive at some point down the road a
25 decision to -- to David's point, a decision do we

1 replace it or do we just -- you know, can we keep --
2 afford to fix the one we've got because it's so
3 complex, it's very expensive, or do -- or do we just
4 replace it? And so I don't know if it's possible to
5 capture the maintenance cost and analyze that as you
6 look at different target efficiencies in your
7 scenarios, but I think that is -- it would be good if
8 we could.

9 MR. McMAHON: I appreciate that comment.
10 This is Jim McMahon.

11 Yes, we intend to do that. We have a
12 methodology that allows us to basically develop a
13 schedule of maintenance costs year by year over the
14 life of the product. And that may be different for a
15 78 AFUE compared to a more efficient high end model.
16 If -- if we can get that data, we would love to use it
17 and keep that separate from the energy cost
18 implications, which are also different between the two
19 models.

20 MR. BROOKMAN: David, follow-on?

21 MR. BIXBY: Yeah. Just getting back to the
22 car thing, I get calls from consumers all the time with
23 respect to maintenance issues and I always ask 'em,
24 well, when's the last time you had your heating
25 equipment looked at -- inspected? And, well, I've

1 never -- I've been here in this house 10 years and I've
2 never had it inspected. How often do you get your car
3 maintained and inspected? Oh, every six months. So, I
4 mean there's a different mentality with respect to cars
5 and heating equipment.

6 MR. McMAHON: Doug, before --

7 MR. BROOKMAN: Yes?

8 MR. McMAHON: There was one other question
9 that Mr. Lynch mentioned about and other people did
10 about the repair/replace decision. For other products
11 -- and this comes later in the analysis when we're
12 getting to national impacts. Right now we're dealing
13 with individual consumers. But when we get to looking
14 at what the national shipments are going to be, we do
15 look at that issue. And if we have this information
16 about how the maintenance costs go up, we can look at
17 historically how consumers have made that decision and
18 what lifetime they've lived with.

19 There's two things going on, where you have a
20 choice of paying more and including that in the
21 economic analysis to cover the maintenance or you can
22 take it out and replace it with a new furnace. We do a
23 methodology for dealing with the replace or repair
24 decision and how that will be changed due to a standard
25 but we just need the data.

1 MR. BROOKMAN: Thank you. Your name, please?

2 MR. F. WALTER: Frank Walter, Manufactured
3 Housing Institute.

4 In answering the last question should
5 lifetimes be the same, it seems to me if lifetimes are
6 going to be the same then you -- that means averaging
7 them from all input you receive. Then that means
8 averaging maintenance costs and first costs and
9 everything -- every other cost in order to do your LCC.
10 Is that not the case? Otherwise, you do an LCC for
11 every model for every manufacturer and then average
12 those.

13 MR. McMAHON: You've stated two extremes and
14 we're trying to go somewhere at neither of those. If
15 there are reasons to believe that the lifetimes are
16 different for different product classes, we would like
17 to know that so that we're not just dealing with
18 average values if that's inappropriate. But no, I
19 don't believe we need to get a lifetime for a model. I
20 don't think we're in the position to do that, but we
21 would like to just deal with -- our default position is
22 we have an average lifetime. GAMA has suggested values
23 for that. We could use that for all furnaces and all
24 boilers and be done, but if there's other factors that
25 we should consider we would like to hear about that.

1 MR. BROOKMAN: Charlie Stephens?

2 MR. STEPHENS: Charlie Stephens, Energy
3 Office in Oregon.

4 Just to get -- prompt Jim a little bit here,
5 it seems in -- in past analyses your -- your national
6 impacts analysis that you referred to earlier does
7 deliver a range of lifetimes when you actually carry
8 that through.

9 MR. McMAHON: Right.

10 MR. STEPHENS: And so, you don't end up with
11 an average value. You end up with a distribution of
12 lifetimes around that average value typically based on
13 those decisions that your model suggests that consumers
14 make, is that correct?

15 MR. McMAHON: That's correct. That's right.

16 MR. STEPHENS: So -- so, in effect, you --
17 you don't have a single lifetime, you have a
18 distribution of lifetimes?

19 MR. McMAHON: Right. That's why I
20 characterized that as an extreme. We -- we -- you
21 would have to go back many years to a time when we used
22 a single lifetime. In recent analyses over many years
23 now we've used distributions to reflect the differences
24 in variability that -- that we know are going on in the
25 real world. I mean it's simple. When you think about

1 furnaces an 18-year life is totally reasonable. We all
2 have anecdotes about somebody who owns a 50-year-old or
3 60-year-old furnace and we also know some that failed
4 early, so it's difficult to use one single value and
5 defend it so we'd like to have that distribution.

6 MR. BROOKMAN: Harvey and then Bill Prindle.

7 MR. SACHS: I've perhaps been unfair in
8 tweaking some of my colleagues across the table, but,
9 Jim, I think that to use anything other than a constant
10 maintenance cost within furnaces and within boilers
11 independent of the efficiency level would be highly
12 speculative and would be unfair to the manufacturers.
13 Across a very broad range of products we've seen
14 improvements in quality and have no reason to expect
15 that these will not continue. We have no reason to
16 believe that offshore competitors aren't looking for a
17 failure of this industry to continue improving, so I
18 think you would send a very strong, inappropriate
19 signal if you were to associate the assumption of
20 higher maintenance costs with the assumption of higher
21 efficiency. And conversely, to assume higher
22 maintenance costs for lower efficiency units would seem
23 to be without any basis in fact as well.

24 MR. BROOKMAN: Bill, I'm thinking -- in fact,
25 I'm hoping that perhaps we're running life cycle costs

1 to a point of conclusion and we're going to be moving
2 on here shortly, so --

3 MR. PRINDLE: Just a quick one. Jim, given
4 the volatility of heating fuel prices in the last two
5 years, what do you expect to be doing in terms of
6 choosing a base year?

7 (Laughter)

8 MR. BROOKMAN: Thank you, Bill.

9 (Laughter)

10 MR. BROOKMAN: He'll get back to you on that
11 one.

12 (Laughter)

13 MR. BROOKMAN: Okay? Final comments on life
14 cycle? Yes, Jim Crawford?

15 MR. CRAWFORD: A couple of things. That last
16 one kind of -- just about blew me off the track.

17 I think, number one, the volatility that
18 we've seen has -- the extreme volatility has been in
19 the spot market. And let's not confuse spot market
20 with -- with what rational people are paying for gas.

21 I think that when we -- you -- we talked
22 about marginal energy rates, and we didn't say marginal
23 versus average but I think that's what we're talking
24 about. The last time we went through this together I
25 think that we spent 22 man months on the activity to

1 conclude that there really wasn't a heck of a lot of
2 difference. I'd -- I'd hate to see us get too wrapped
3 up in pretending like there was a rigorous detail here
4 that didn't really exist. And I don't think anybody in
5 this room can stand up there and tell me that they're
6 going to give me the mark -- a fore -- a 20-year
7 forecast of marginal rates and can do so with a
8 straight face.

9 MR. BROOKMAN: Okay. John?

10 MR. McMAHON: To respond to Bill's comment
11 that I was kind of glib with, the good news is that
12 with a product with an 18- or 20-year lifetime that if
13 we have -- we have to deal with what the energy price
14 is going to be over that period of time. So, the fact
15 that there's volatility in the market on a month-to-
16 month or season-to-season basis is not going to be that
17 big a deal as getting the mean value reasonably
18 correct.

19 MR. BROOKMAN: John Marran, then Charlie
20 Stephens.

21 MR. MARRAN: John Marran, Energy Kinetics.

22 The -- in the lifecycle analysis we're
23 looking for statistics on interest rates and energy
24 costs within a percent or two or something in the
25 future years and yet if I -- I can't speak for the

1 people in the furnace business but I can say as a
2 manufacturer of a boiler that the AFUE procedure does
3 not deliver within any reasonable statistical accuracy
4 the net consumer annual operating cost. It may do some
5 comparisons between the boilers but the actual
6 operating cost in houses is all over the place for a
7 comparable AFUE. And there's a problem in the AFUE
8 test procedure that gives you a greater statistical
9 error, I believe, than all the other ones that you're
10 talking about in your analysis.

11 And I -- if we're going to talk about
12 marginal differences in products, I'm very concerned
13 that we have a big -- big error -- big distribution
14 there and we have a timeframe where we can't change the
15 test procedure but we're trying to do an analysis for
16 12 years out on a procedure that is now 20 years old
17 that probably needs to be updated in the longer term, I
18 guess.

19 MR. BROOKMAN: Go ahead, Dan.

20 MR. McMAHON: Let me respond to that, please.

21 MR. BROOKMAN: Yes.

22 MR. McMAHON: John, that's a very good
23 comment and I guess I didn't make an explicit statement
24 that I should have made, which is when we're doing the
25 lifecycle cost calculation we're not making the

1 assumptions that are in the test procedure. We're
2 trying to calculate the actual energy consumption in
3 individual households and to reflect the variability
4 that we know is really there.

5 So, I appreciate your comment but we're
6 trying to recognize that and -- and do better
7 estimates, if you will, in this safety analysis.

8 MR. BROOKMAN: Dan?

9 MR. DEMPSEY: Dan Dempsey, Carrier.

10 I just wanted to speak from a firm's
11 manufacturer's viewpoint on that. ASARAE developed a
12 pretty sophisticated first principles dynamic
13 simulation of a residence back in the '80s and '90s.
14 It was called SP-43. It was a model that was
15 calibrated to two homes based on actual field data.
16 And there was analysis done to compare predicted energy
17 consumption against AFUE and the results were very
18 clear that AFUE was a very strong predictor of the
19 actual energy consumption one would expect to see in
20 their home.

21 MR. BROOKMAN: Thank you. Charlie, you're
22 next and then I'll -- then I'll go to you --

23 MR. STEPHENS: Yeah. I hate to bring us back
24 to energy forecasting because it's -- it's an ugly
25 business but I'm in it. It's part of what I do.

1 I just had a conversation with the gas people
2 in our own region a month ago about their forecast and
3 come October we were told that when our rate -- final
4 rate increase takes place we will have doubled our gas
5 rates at the consumer level in the last 18 months and
6 they told us not to expect any real relief in the
7 discount period. That will bear most of the weight in
8 your analysis.

9 So, there is that possibility. It's a very
10 real and of course I fully expect that those kinds of
11 rates ultimately, when you get down the road, will be
12 done -- maybe at one end or they may be in the middle
13 of your spectrum of -- of possibility but you are going
14 to be using a distribution of prices, I'm sure.

15 MR. McMAHON: Well, two comments. We're
16 using a distribution to account for variability. We're
17 also doing scenarios. We're not just doing one
18 assumption about the future. So, we will do a high
19 price scenario, a low price scenario, and a middle of
20 the road scenario to try and capture this very
21 difficult uncertainty.

22 MR. STEPHENS: Thank you.

23 MR. BROOKMAN: You're next.

24 MR. CUI: Shuqing Cui. I have a comment
25 about lifetime. For boiler industry there are several

1 different construction materials. There are casting
2 iron and steel, copper and casting aluminum. I think
3 they should have different lifetimes.

4 MR. BROOKMAN: Okay. Thank you. David?

5 MR. BIXBY: Yeah. Just following up on that,
6 at the present time unless we get a big consensus from
7 our boiler members we're not advocating splitting up
8 boilers into cast iron, copper -- as far as the
9 analysis is concerned we're advocating steam and hot
10 water only.

11 MR. BROOKMAN: Thank you. Okay. Final shots
12 at life cycle?

13 (No response)

14 MR. BROOKMAN: Then, we're moving on to
15 consumer subgroup analysis.

16 E. Consumer Subgroup Analysis

17 (Slide)

18 MR. McMAHON: Okay. The consumer subgroup
19 analysis. This is an extension of the lifecycle cost.
20 Presentation here is very brief.

21 Again, the motivation. The "Federal
22 Register" notice in 1996 which changed the process the
23 Department uses stated the Department will use regional
24 analysis and sensitivity analysis tools as appropriate
25 to evaluate the potential distribution of impacts of

1 candidate standard levels on consumers. The Department
2 will consider impacts on significant segments of
3 society, and that's what's important here, in
4 determining standards levels. Where there are
5 significant negative impacts on identifiable subgroups,
6 DOE will consider the efficacy of voluntary approaches
7 as a means to achieve potential energy savings.

8 (Slide)

9 MR. McMAHON: Now, for the residential
10 products in the past those significant subgroups that
11 have been looked at are low-income households, and this
12 was alluded to by Jim Crawford a minute ago, they may
13 have different lifecycle cost impacts than the general
14 population. And for clothes washers, we looked at
15 elderly households because their usage was very
16 different than the general population.

17 So, the question for the group today or in
18 your written comments is what are your feelings about
19 what subgroups should be considered for residential
20 furnaces and boilers, if any?

21 MR. BROOKMAN: Comments on subgroups?

22 (No response)

23 MR. BROOKMAN: Okay. No comments? Harvey?

24 MR. SACHS: I don't have a comment but I do
25 have a question. You refer to low-income and what's

1 not clear to me is whether that means from a tenant
2 perspective or a low-income homeowner perspective.
3 There are some very important differences I'm sure
4 everyone is sensitive to.

5 MR. McMAHON: We were dealing with low-income
6 for the entire population whether or not they owned a
7 home. Is that your question?

8 MR. SACHS: I -- I guess I just don't
9 understand that, but we'll probably explore it later,
10 that the decision-making for a tenant --

11 MR. McMAHON: Yes.

12 MR. SACHS: -- on the HVAC equipment is
13 different from the decision-making by a low-income
14 freeholder on his own behalf.

15 MR. McMAHON: Right.

16 MR. SACHS: Or may be different.

17 MR. BROOKMAN: Okay. David Bixby?

18 MR. BIXBY: Yes, David Bixby, GAMA.

19 DOE has asked us to identify some consumer
20 issues associated with higher efficiency furnaces. And
21 we feel DOE should consider at least the following:
22 condensate disposal, recycling of plastic components,
23 orphaned water heaters, and pressures on low-income
24 consumers to fix their existing furnace or boiler
25 rather than purchase a more expensive replacement

1 furnace or boiler.

2 MR. BROOKMAN: Thank you. Other comments on
3 consumer subgroup analysis? I think we're going to
4 keep moving here.

5 Jim?

6 F. National Energy Saving
7 and Net Present Value Analysis

8 MR. McMAHON: All right. The last element of
9 the analysis before the advance notice is national
10 energy saving and net present value.

11 (Slide)

12 MR. McMAHON: Now, we've done the individual
13 consumers now. We've dealt with their variability and
14 uncertainty. Now we need to provide the Department
15 with some estimate of what the national impacts are of
16 different standard levels that they might consider.

17 So here's the overview. Energy consumption
18 for residential space heating by fuel will be
19 calculated annually for a base case and for each of the
20 potential standards cases. The differences between the
21 base case consumption and consumption on each standards
22 case will be calculated and presented as energy
23 savings. The results are reported in physical units,
24 for example quadrillion Btus of primary energy by fuel
25 and economic units, namely dollars, for each year.

1 We'll also add them up over the period of time and give
2 cumulative values.

3 The period of analysis is from the start date
4 of the standard -- we're now talking about perhaps 2012
5 for the standard for all furnaces and boilers -- to
6 about 30 years later or 20 to 40 years. Why such a
7 long period of time? Well, the first reason is that
8 these products have a long lifetime. Round numbers
9 around 20 years. And so, even if we changed all of the
10 furnaces tomorrow we would have impacts for 20 years.

11 However, our standard affects new purchases
12 of furnaces and the entire population is not going to
13 replace all their furnaces and boilers in one year.
14 Because the lifetime is roughly 20 years, 18 to 25 for
15 these products, it's going to take that period of time
16 before we even have the entire population having their
17 first year of experience with the new product. So
18 therefore, as a rough rule of thumb you want to take
19 twice the lifetime as the period of time for analysis.

20 (Slide)

21 MR. McMAHON: Now, this presents us with
22 problems because the longer the period of time we're
23 trying to forecast, the more difficult it is. So, in
24 the past the Department of Energy has analyzed out to
25 the year 2030. That's for rules even up to the most

1 recent ones that are going into effect in a few years'
2 time. So it's included -- or things with a shorter
3 lifetime, something like a 25-year or 30-year period of
4 time.

5 For furnaces, because they have a long
6 lifetime, it's our feeling that we need to consider a
7 long period of time to capture most of the impacts.
8 We're talking about physical energy savings and the
9 impacts of a new policy will go on for a long time.

10 We welcome your comments on what the period
11 of time ought to be specifically.

12 (Slide)

13 MR. McMAHON: Now, the first part of the
14 national impacts is shipments. The standards affect
15 the manufacture of new products. As we've indicated,
16 we expect that a new standard level is likely to effect
17 the installation cost of the product and also the
18 operating cost. Consumers and home builders and others
19 who purchase furnaces and boilers will then be faced
20 with decisions about how many of which to buy.

21 Now, the simplest thing to do is to
22 extrapolate shipments from a time series. Take a
23 historical period that that information is available
24 and say that that trend, whatever it is, is going to go
25 on for the next 30 or 40 years. That's very dangerous

1 because you don't explicitly account for changes in the
2 number of households, the percent of households that
3 own this type of equipment as opposed to something
4 else, changes in the installed or operating costs.

5 The other method that is our preferred method
6 is to use an accounting tool and try to take account of
7 at least the major parts of these. The trade-off, of
8 course, the disadvantage of that is we now have to
9 forecast a number of independent variables. New
10 households, the percent of them that will have a
11 particular type of equipment, how much replacement will
12 go on as a function of the equipment lifetime, and the
13 last bullet on here is it's the Department's intention
14 to consider the impacts of existing non-regulatory
15 programs on the efficiencies in the future year -- in
16 future years in the base case.

17 So, for example, Energy Star or utility
18 programs or industry initiatives or other things that
19 are going to go on are likely to increase the
20 efficiency or the share of products that are efficient
21 over time. We want to capture all that in the base
22 case so that the effective standards is only the
23 incremental on top of that.

24 (Slide)

25 MR. McMAHON: So, again, I'm going to give

1 you questions here and then step through a couple of
2 things and we'll come back to the questions.

3 What other approaches, if any, should the
4 Department consider to establish the forecast for
5 shipments in the base and standards cases? What are
6 the best information sources for past shipment data by
7 efficiency level, if that's available? And what non-
8 regulatory initiatives should be considered as
9 affecting efficiencies in the base case?

10 (Slide)

11 MR. McMAHON: Okay. As we discussed in
12 lifecycle cost, there are a number of economic factors
13 that affect consumer choice -- fuel choice and we're
14 well aware that there's a potential for fuel switching
15 if the Department sets standards for oil and gas
16 furnaces or oil and gas boilers in such a way that it
17 influences consumer decision-making.

18 Operating expenses, which are typically
19 hundreds of dollars per household per year depend upon
20 the fuel type, the usage behavior, and the energy
21 prices in that region and how they're going to change
22 over time.

23 In 1997 \$42 billion was spent in the U.S. for
24 household space heating, and here's the breakdown by
25 fuels. The purchase expenses, which are typically

1 thousands of dollars for installation according to some
2 data. \$11 billion was spent for HVAC replacements in
3 1994 - '95 period. In addition to that, there were
4 equipment costs and new construction. So clearly, we're
5 talking about large sums of money on an annual basis.

6 (Slide)

7 MR. McMAHON: Main heating fuels for the last
8 20 years. Each of the bars there represent a year. It
9 may be easier to see the years on your handout. The
10 left-most bar that's green on the screen is 1978. The
11 middle bar, blue, is 1987, and the right-hand bar is
12 1997. And this shows the percent of households in the
13 U.S. by main heating fuel.

14 You can see that gas remained the most
15 frequently used mean heating tool, 55 percent in 1978,
16 52 percent in 1997.

17 Electricity has increased from 16 percent up
18 to 30 percent. Fuel oil or kerosene has decreased from
19 22 percent to 10 percent, so we're well aware that fuel
20 choice can change over time but if we're talking about
21 the next 20 to 40 years it could change then.

22 (Slide)

23 MR. McMAHON: Historically, fuel
24 availability, changes in relative energy cost, utility
25 programs, and other factors have caused fuel switching.

1 We're aware of the statistics from the American Gas
2 Association. Here I talk about the 10-year period from
3 1986 to '96. The AGA reports, and correct me if I have
4 any of this wrong, are that about 148,000 to 311,000
5 housing units annually converted from some other fuel
6 to natural gas house heating. And I compared that to
7 shipments and calculate that this represents three to
8 eight percent of annual gas furnace shipments. So it's
9 not dominant but it is a factor.

10 (Slide)

11 MR. McMAHON: Okay. I'm now going to move
12 away from shipments and fuel choice to the other part
13 of this, which is dollars, the net present value.

14 Question?

15 MR. DEMPSEY: Dan Dempsey at Carrier again.

16 Certainly, you're -- you're concerned about
17 fuel switching but is DOE going to keep kind of their
18 eyes open relative to maybe product switching to where
19 the market moves to products that currently are not
20 covered?

21 MR. NASSERI: This would be your comment?

22 Well, traditionally, the impact basically when you go
23 in regulatory and change your standards you look at the
24 fuel switching. But obviously, he can make this
25 comment in your written comments and we look at it and

1 see how that affects our lifecycle and other analyses.

2 MR. DEMPSEY: Well, it was pointed out this
3 morning that the combination appliances is currently
4 not a covered product. It doesn't have a test
5 procedure. But it is a very larger, growing part of
6 our market. So, the potential does exist for product
7 switching.

8 MR. NASSERI: Well, we would like to receive
9 your comments concerning that specific type of products
10 in the written comments next -- till August 17. And
11 even though we say that we don't have any DOE test
12 pursuit at this time, but as you know, there is
13 commercially a test procedure available for that
14 product. And the comment might be -- why -- DOE uses
15 that or meaning "using that," means we have to start
16 developing a test procedure, having a DOE test
17 procedure in place.

18 As you know, when we receive your comments
19 concerning the specific type of products in the written
20 comments in the next -- until August 17th and even
21 though we say that we don't have a DOE test procedure
22 at this time but, as you know, there is commercially a
23 test procedure available for that product. And the
24 comment might be -- DOE uses that or -- meaning "using
25 that" means we have to start developing the test

1 procedure -- having a DOE test procedure in place.

2 That is my -- might be feasible. We have to
3 look at the nature of the -- the work and what we have
4 to do because we are staffing and funding and all that
5 for starting another rule on the test procedure. But
6 assuming that if we'd be able to -- to come up with
7 that and we have the staffing and funding basically the
8 process improvement says that before the phase of NOPR
9 we should have a test procedure in place. And we might
10 be able in -- we're talking about two years. We might
11 be able to go ahead and have that test procedure and
12 basically be able to evaluate that product.

13 MR. McMAHON: I think there are two questions
14 here. One is whether -- if DOE regulated the gas and
15 oil products, for example, and didn't do anything on
16 combination products whether that might cause a shift
17 in the market towards the combination product. And the
18 second question is whether DOE would consider standards
19 on the combination.

20 And I -- Dan, I agree with the thrust of the
21 your comment that it -- it would seem from an
22 analytical point of view to be appropriate to look at
23 the various products that compete in the marketplace
24 whether or not they are covered by this regulation and
25 look at the impacts on that whole market.

1 MR. BROOKMAN: Are you -- go ahead, Jim
2 Ranfone, and then David and then maybe we'll get to the
3 last of Jim's slides.

4 MR. RANFONE: Jim Ranfone, American Gas
5 Association.

6 Just a question or comment on your
7 residential main heating fuel analysis where you show
8 from 1978 to '97 figures. That's all for stick-built.
9 You know, we consider those -- since you're going to be
10 doing an analysis of manufactured home furnaces, that
11 market would be much different. The main heating fuel
12 for that market is substantially different than what
13 you show here, so are you going to be taking a look at
14 that as your baseline rather than this for the
15 manufactured home furnaces?

16 MR. McMAHON: I agree that the manufactured
17 home fuel shares are different and, yes, we will look
18 at those.

19 MR. RANFONE: Thank you.

20 MR. BROOKMAN: David, do you wish to comment
21 now or wait for --

22 MR. BIXBY: I'm forever holding my peace.

23 MR. BROOKMAN: We'll return to you.

24 Jim, why don't you finish out the -- and then
25 we'll return to the questions.

1 (Slide)

2 MR. McMAHON: Okay. So, the other aspect of
3 this and the last slide in this presentation is the net
4 present value. Once we've calculated the impact on
5 shipments, from that we can calculate the impacts on
6 energy. And since we now know the energy prices for
7 the next 30 or 40 years, we can calculate the economic
8 impact. See, it gets easier as you go along.

9 For each year analyzed we will calculate the
10 difference in installed costs and in operating costs.
11 Those are two calculations between the base case and
12 each standards case. We will discount the future
13 values to the present.

14 And I want to be clear there. We will
15 present both the annual values and the discounted
16 values, so if there's any question about discount rates
17 everyone will be able to use their own favorite
18 discount rate to calculate the net present value.

19 The discounted values will include the
20 operating cost over the lifetime of the equipment
21 purchased. So, for example, there's an end effect. If
22 we were to say what's the net present value for the
23 period the year 2012 to 20, let's say, 40, furnaces
24 purchased in the year 2040 would then have savings,
25 perhaps, over 20 years for their lifetime. We capture

1 that end effect by calculating the operating cost over
2 the life of everything bought in a particular block of
3 time. Does that make sense? Okay.

4 Finally, we sum over all the years -- sum
5 over all the years to get the net present value. If
6 the present value of savings exceeds the present value
7 of cost, the net present value is positive and the
8 Department looks upon that as a good outcome. If the
9 present value of costs exceeds -- of cost exceeds
10 savings, it should say, then the net present value is
11 negative and the Department will need to take that in
12 consideration with all the other factors about whether
13 the standard is still economically justified.

14 That concludes the presentation on national
15 energy savings and net present value.

16 MR. BROOKMAN: I saw both David and Jim
17 Crawford. Jim, you were first.

18 MR. CRAWFORD: Jim Crawford, Trane.

19 I think I only have one more comment.
20 Relative to fuel switching specifically between natural
21 gas and electricity, I think that's more of a spook
22 issue than anything else. People who have natural gas
23 at the curb predominately will use that to heat their
24 space. That will remain the case unless the gas
25 industry does something really stupid. And they've

1 been going for over 100 years and they haven't done
2 anything that stupid yet, so I -- I have faith in our
3 gas suppliers on that hand.

4 MR. BROOKMAN: Thank you -- back to page 20.
5 That's where the questions are.

6 David Bixby? No? Nothing there.

7 Yes, Jim Mullen?

8 MR. MULLEN: Yeah, Jim Mullen, Lennox.

9 You -- you cited a couple interesting numbers
10 back there. \$42 billion for space heating in '97 --

11 MR. BROOKMAN: Give the page, please, Jim?

12 MR. MULLEN: 21.

13 MR. BROOKMAN: Okay. Go ahead.

14 MR. MULLEN: That -- Jim's found it already.
15 Where do those numbers come from?

16 MR. McMAHON: That's from the residential
17 energy consumption survey that DIA does -- did in 1997.

18 MR. MULLEN: Okay. What's the easiest way to
19 get at that -- the data that's behind that or the
20 survey? Is that available on a Web site somewhere?

21 MR. McMAHON: It's available at the EIA Web
22 site.

23 PARTICIPANT: Bureau Census.

24 MR. MULLEN: Bureau Census?

25 PARTICIPANT: Yeah.

1 MR. McMAHON: No. Department of Energy,
2 Energy Information Administration, and in fact, right
3 down the hallway if you want to pick up hard copy you
4 can get a report from them.

5 MR. MULLEN: Okay. Thank you.

6 PARTICIPANT: The Web site address is on the
7 bottom of page 22.

8 (Pause)

9 MR. BROOKMAN: Yeah, if you can look at the
10 bottom of page 22 that's where you need to look for --
11 for those data.

12 MR. MULLEN: Thank you.

13 MR. BROOKMAN: Other comments or questions
14 related to the questions that are on page 20?

15 (Pause)

16 MR. BROOKMAN: We're looking for a base case
17 and standards cases approaches.

18 Yeah, this was specific to shipments. If you
19 have questions about the other parts that's fine, too.
20 Thank you.

21 (Pause)

22 MR. SACHS: Harvey Sachs again. I guess I
23 would like to see fleshed out in somewhat more detail
24 what ya'll are proposing on the -- how to include the
25 impacts of the non-regulatory approaches such as

1 utility programs, and Energy Star. I just -- I just
2 can't imagine that's an analytical way to get at these,
3 as important as they might be.

4 MR. McMAHON: Let me answer that in brief and
5 we'll be happy to provide details as we work them out.

6 What is typically done is that we look for --
7 we start with this process -- a listing of all the
8 existing programs that are likely to have an impact in
9 the time period we're looking at. And then it's our
10 responsibility to come up with some estimate.

11 We start with the current distribution of
12 product by efficiency and we make some estimate about
13 the extent to which that distribution will be changed
14 by these non-regulatory programs. And there is a
15 certain amount of subjectivity and professional
16 judgement that's involved in that. It's available for
17 public review and we welcome your comments.

18 MR. SACHS: Again, I don't think it's
19 something we want to belabor here, but I -- it
20 certainly has been a challenge to EPA to estimate the
21 fraction of the above baseline product sold today that
22 it should take credit for under Energy Star.

23 MR. McMAHON: Nobody said it'd be easy.

24 MR. BROOKMAN: Thank you. Other comments on
25 these bullet points on page 20?

1 (No response)

2 MR. BROOKMAN: That's it. Okay. I'm going
3 to suggest we take a break at this time. 3:00 it is.
4 We'll start back up at 3:15 and go through the rest of
5 these presentation topics. I think you'll find that
6 many of these other presentation topics will be fairly
7 brief since this is the final piece prior to the
8 issuing of the advanced notice of rule -- rulemaking --
9 proposed rulemaking. So -- so, it could be that we'll
10 finish a little early this afternoon although I may be
11 bold in making a prediction.

12 (Brief recess)

13 MR. BROOKMAN: Welcome back. Thank you for
14 coming back on time so we can conclude the workshop.

15 The next presentation is on manufacturer
16 impact analysis. Mark Kendall, Arthur D. Little.

17 G. Manufacturer Impact Analysis

18 (Slide)

19 MR. KENDALL: Going back to the flow chart.
20 As we said this morning, the topics now will move very
21 quickly because up until this point we've discussed all
22 of the analyses that we're going to be working on for
23 the next year. And after we finish those analyses
24 we'll have time to get back together, regroup, proceed
25 to the next stage. The remaining presentations from

1 this afternoon are going to be talking about those next
2 stages, so we just wanted to give you a preview of what
3 we do there. If you want to provide comments or ask
4 questions about these at this time, that's fine. But
5 the main thrust of what you need to know is just be
6 aware that these will be done at some point in the
7 future.

8 (Slide)

9 MR. BROOKMAN: The first one we'll talk about
10 is the manufacturer impact analysis. The law requires
11 the Department of Energy to assess the impacts of more
12 stringent standards on manufactures, and that's what
13 this is all about. And these four bullet points, I'll
14 just present to you the questions that we ask ourselves
15 and we ask for input on during that time.

16 So, we look at impacts of standards on cash
17 flows and net present value for the industry. Product
18 flows through distribution channels is something we're
19 interested in. Manufacturing capacity, specifically
20 outlined in the legislation it asks whether there would
21 be -- a new standard would result in an increase in
22 manufacturing capacity. For example, if somebody's --
23 if the shipments in the industry drop so much that now
24 we have a lot of stranded capacity laying around.
25 That's a question we have to look at. Employment

1 levels and impacts on competition, that's a topic that
2 the Department of Justice also weights in on and we try
3 to provide them with some information that they can
4 then use to assess impacts on competition.

5 The second bullet point talks about products
6 or subgroups of manufacturers similar -- similar to the
7 way we talked about subgroups of consumers. There may
8 be subgroups of manufacturers that are differentially
9 impacted, so we will look at those.

10 The third bullet is cumulative regulatory
11 burden. The legislation also requires DOE to consider
12 the effects that standards will have not just by
13 themselves but when you add in all of the other
14 regulations that manufacturers face. And so, we've --
15 we've come up with a few techniques for considering
16 those.

17 And the last bullet point is really a
18 question that you can start thinking about now. If
19 there's anything that you think is important on
20 understand -- on -- for having us understand impacts on
21 manufacturers that didn't make the list or that isn't
22 being discussed in the framework document, please make
23 sure and include that in a written comment so that we
24 can evaluate that and address it if that's appropriate.

25 So, that would conclude my presentation on

1 the manufacturer impact analysis.

2 MR. BROOKMAN: So that's the broad outline.
3 If there's anything major you see missing perhaps you
4 should say so now, knowing that this will happen
5 perhaps a year from now.

6 MR. KENDALL: And also, I should -- oh,
7 sorry. I should bring up at this point, too, that we
8 haven't mentioned it yet today but historically and I
9 think the plan for this rulemaking as well is to visit
10 manufacturers in their own facilities or in their own
11 offices where they can discuss with us and the
12 Department, whoever attends, issues that are specific
13 to their company. And at this point going forward over
14 the next year, we -- you know, we certainly have the
15 opportunity to visit some companies and we'd like to
16 focus on the topics that we covered this morning or --
17 but we also want to be prepared for some of these
18 manufacturer impact issues so that we can look at
19 handling those down the road.

20 MR. BROOKMAN: Thank you. Comments,
21 questions on manufacturer impact analysis?

22 (No response)

23 MR. BROOKMAN: Okay. Then let's proceed.
24 Employment impacts analysis. It's frequently the case
25 in my experience that DOE might change its posture, but

1 many of these major impact analysis activities are
2 accompanied by workshops to look at preliminary results
3 and the like. So that's more information for you.

4 Jim McMahon?

5 H. Employment Impact Analysis

6 MR. McMAHON: This is a very short one.
7 Employment impacts.

8 (Slide)

9 MR. McMAHON: One of the effects of standards
10 is to affect employment. There are both direct and
11 indirect employment impacts. The direct impact will be
12 captured in the manufacturer impact analysis that Mark
13 just described.

14 In addition to that, indirect employment
15 impacts occur because of shifting consumer expenditures
16 among goods, what's called a substitution effect, and
17 also changing equipment and energy costs, which is an
18 income effect.

19 Fundamentally, what's happening here is if
20 you think about the two futures that we're forecasting,
21 the base case and the standards case, presuming that
22 standards cause an increase in installed costs and a
23 decrease in operating costs, that shifts the economics
24 a bit. On a national scale these are very small
25 effects, but nonetheless, when you add them up a small

1 fraction of a percent nationally can be enough jobs to
2 worry about. And so this analysis attempts to estimate
3 those to be complete about the employment impact.

4 So that's basically all we have to say about
5 that. We welcome comments about any methods that
6 should be used to estimate the employment impacts.

7 MR. SACHS: Harvey Sachs again. I don't have
8 a suggestion on methods. I do have some questions
9 about how this is to be done.

10 One question is that there are continuous
11 trends in employment in this industry which have gone
12 on for years. This productivity has improved. So,
13 what we're really looking for is the differential
14 productivity change which is likely to be a fairly
15 small number. And I would urge -- and I -- I don't
16 know that. I'm guessing that. But I would urge that
17 the employment impacts be put in context of the
18 interregional variability and employment in the industry
19 as shipments move up and down by 10 or 20 percent in
20 the context of the general economic cycle.

21 So, it -- it -- it does seem to be important
22 to -- to provide an appropriate context for the
23 estimated employment impacts.

24 MR. McMAHON: If I understand correctly, your
25 question is directed at the direct employment impact in

1 the industry, is that correct?

2 MR. SACHS: Yeah. Where industry may include
3 not just the -- the factory and the manufacturer but
4 the -- the full value chain.

5 MR. McMAHON: I'll refer to ADL to answer
6 that.

7 MR. KENDALL: This is Mark Kendall from ADL.
8 I think you're just making the point that that's
9 something that you'd like us to consider at that time.

10 MR. SACHS: Yes. I mean where I've worked
11 with manufacturers I've seen that a good year's second
12 shift and a bad year is less than a full shift so that
13 there are large interregional variabilities as well as
14 historical trends. And I think it's very important to
15 just benchmark the scale of your model estimates
16 against the -- the kinds of uncertainty and the kinds
17 of variability the industry sees on a year-to-year
18 basis as they're doing their business planning.

19 MR. KENDALL: Okay. Thanks. We'll try to
20 put that on the agenda for the next workshop that we
21 have where we'll discuss the manufacturer impact
22 analysis and these other analyses in greater detail.

23 MR. BROOKMAN: Other comments on employment
24 impacts analysis?

25 (No response)

1 MR. BROOKMAN: Okay. Utility impact
2 analysis. Jim McMahon.

3 I. Utility Impact Analysis
4 (Slide)

5 MR. McMAHON: Let me first be clear about the
6 jargon here. Utility impacts in this presentation
7 refer to the impacts on energy utilities, electric and
8 gas companies. This is not talking about consumer
9 utility or amenity.

10 The purpose and method. The purpose is to
11 estimate the effect -- effects on electric and gas
12 suppliers of reduced energy sales due to the new energy
13 efficiency standards. The proposed method is to use
14 the -- the national energy modeling system, DOE's
15 official energy model. It says here "NEMS-BRS." BRS
16 is Building Research and Standards. That's the office
17 of Department of Energy that funds it. The reason we
18 distinguish NEMS-BRS from just NEMS is that just NEMS
19 can only be used by the Energy Information
20 Administration and any other user has to call it
21 something else. So that's why it's NEMS-BRS.

22 It's an integrated model of the U.S. energy
23 sector. It includes all supply and demand by all
24 fuels. It's a publicly available model although it's a
25 monster. It does forecast right now out through 2020.

1 There are methodologies for extrapolating beyond 2020.
2 A year or two from now when we use this in the analysis
3 I expect that EIA will be at least out to 2030. We
4 still may need to extrapolate beyond that, but there
5 are methods for doing that.

6 The current basis, if we were to do the
7 analysis today, would be the Annual Energy Outlook
8 2001. But we will update the model whenever EIA does.
9 Usually that happens annually towards the end of the
10 calendar year. And just for your information, the
11 current model is running on personal computers, not on
12 a mainframe so it is available if people want to get
13 into that.

14 (Slide)

15 MR. McMAHON: The inputs that we're concerned
16 about are annual energy consumption and savings by fuel
17 type for residential furnaces and boilers which we will
18 get from our National Energy Saving spreadsheet, and I
19 described the national energy savings methodology to
20 you earlier. If you'd like a preview of what that
21 methodology is likely to look like, you can download
22 the spreadsheets for other products from the DOE Web
23 site. They're available there now for residential
24 water heaters, residential air conditioners, and a
25 couple other products.

1 All the other inputs will be the official DOE
2 forecast inputs that they use for all the energy
3 forecasts.

4 (Slide)

5 MR. McMAHON: So, the method is to use the
6 NEMS model to balance all supply and demand given a
7 perturbation due to savings from new energy efficiency
8 standards. The output will be the change in energy
9 sales and in price of energy by fuel type for
10 electricity, gas, and oil by region. They're all --
11 the other outputs will be the change in the mix of
12 electricity generation, if any, and the change in new
13 capacity both for electric and gas utilities.

14 (Slide)

15 MR. McMAHON: So, the question in this
16 section is should we consider using alternative methods
17 to NEMS for conducting utility impacts analysis and
18 what methods do you think would work?

19 (Pause)

20 MR. McMAHON: I see no comment.

21 MR. BROOKMAN: No comments on this section?
22 Yes?

23 MR. RANFONE: Jim Ranfone -- Jim Ranfone,
24 AGA. Just a question on your inputs. You have annual
25 energy consumption and savings by fuel type. Are you

1 -- do you have the ability to put in both the electric
2 and gas or oil or LP into that as an input? Can you
3 split that out --

4 MR. McMAHON: Yeah.

5 MR. RANFONE: -- per unit?

6 MR. McMAHON: Yes, we can do that?

7 MR. RANFONE: Thank you.

8 MR. McMAHON: It's specifically savings by
9 fuel type and by end use, so it's space heating savings
10 for each fuel.

11 MR. RANFONE: But you can split -- Jim
12 Ranfone. You can split it out the electrical usage for
13 that fossil fuel product?

14 MR. McMAHON: Yes.

15 MR. RANFONE: Thank you.

16 MR. BROOKMAN: John?

17 MR. MARRAN: John Marran, Energy Kinetics.

18 Very quickly, there's an awful lot of oil
19 dealers that are just like utilities, have employees
20 and have impacts. I think the oil dealers -- oil
21 industry should be included in that reference.

22 MR. McMAHON: Thank you.

23 MR. BROOKMAN: Other comments on -- on
24 utility impacts analysis?

25 (No response)

1 MR. BROOKMAN: Okay. Environmental analysis.
2 Jim McMahon.

3 J. Environmental Analysis

4 (Slide)

5 MR. McMAHON: The purpose of the
6 environmental analysis -- we're now down at the end of
7 our impacts analysis -- is to estimate the impact from
8 the standards on important -- on factors important to
9 the environment. Again, we will use the NEMS-BRS model
10 because it does -- it has a good treatment of the major
11 emissions that we're concerned about. I'll get to that
12 in a moment.

13 However, where it's lacking is the in-home
14 emissions and we will calculate those separately using
15 a spreadsheet. We had the same problem with water
16 heaters. Gas furnace or gas water heater emits nox in
17 -- in the home and this is not captured in EIA's model.
18 EIA's model is focusing on electricity power plants and
19 gas supply but is not looking at the emissions in the
20 home. So we have a methodology for dealing with that.

21 (Slide)

22 MR. McMAHON: The impacts that we're
23 concerned about are quantities of U.S. emissions of
24 carbon dioxide and nitrogen oxides from energy supply
25 systems, which we'll get from NEMS and in the home,

1 which we will get from a spreadsheet.

2 In addition, it may affect the trading price
3 of SO2. In the past before there were caps on SO2 we
4 used to calculate the emissions saving from SO2. Now
5 that there are caps, the emissions don't change but the
6 price does and NEMS does calculate that effect.

7 (Slide)

8 MR. McMAHON: So, our questions for today.
9 Are there any additional environmental factors that the
10 Department should consider? And if so, what methods
11 are appropriate for addressing it?

12 MR. BROOKMAN: Jim Crawford?

13 MR. CRAWFORD: Jim Crawford. I don't have an
14 answer to the second question but I -- I think that
15 your timespan is so far out that you should at least
16 give some thought as to whether or not some
17 consideration should be given to the tampering effect
18 climate change has currently forecast on the
19 consumption of energy through these products because
20 you're -- you're out almost at mid-century in your
21 timespan. And if you take -- take the median value,
22 you're up several degrees Fahrenheit and those are --
23 those temperature changes are -- are forecast to be
24 greatest in the winter in the north at night. And
25 that's exactly the time when you have your greatest

1 heating loads.

2 MR. BROOKMAN: Charlie Stephens?

3 MR. STEPHENS: Charlie Stephens, Oregon
4 Energy Office.

5 Having just reviewed a bunch of that data,
6 that -- that data actually is available as far as the
7 -- you know, what forecast they have but it's not all
8 warming. In fact, there are substantial portions of
9 North America that are going to get colder rather than
10 warmer even though the global average temperature may
11 go up. There are some large blue areas on that map
12 that -- that represent a decline in average temperature
13 annually. But the -- the data is -- is there if you
14 should want to consider that.

15 MR. BROOKMAN: Thank you. Yes, sir?

16 MR. F. WALTER: Frank Walter, Manufactured
17 Housing Institute.

18 Is DOE required to file an environmental
19 impact statement or has the Federal government now
20 stopped that type of review? Environmental policy
21 after 1969 requires agencies to file environmental
22 impact statements with CEQ. Is that -- is that no
23 longer required? I mean I'm trying to answer your
24 question, the last bullet.

25 MR. McMAHON: Thank you. And I -- I guess to

1 see Carl Adams there next to the microphone.

2 MR. ADAMS: What we have done in the past
3 rulemakings is we have -- we have performed an
4 environmental assessment and our environmental group in
5 DOE then does an analysis of that and they've come out
6 with in other rules a finding of "no significant
7 impact," which precludes having to do an environmental
8 impact study.

9 MR. F. WALTER: This may or may not be the
10 case in this --

11 MR. ADAMS: We will go through the same
12 process to determine if we do.

13 MR. BROOKMAN: So that was -- the last
14 commentor was Carl Adams. And you got the first
15 commentor there, Charles.

16 Okay. Harvey Sachs?

17 MR. SACHS: Jim, are you assuming the same
18 emissions per Btu in or Btu out across all efficiency
19 levels? Are you working from an assumption that the
20 emissions profile, for example, the condensing furnace
21 with good stoichiometric control might be different
22 from that from a gravity furnace?

23 MR. McMAHON: At this point we had not
24 addressed that issue. I infer from your question that
25 you think there ought to be a difference.

1 MR. SACHS: I'm not sure. I want to know the
2 answer but it seems to me that in some scenarios this
3 could be significant.

4 MR. McMAHON: I appreciate the comment.
5 We'll look into it.

6 MR. BROOKMAN: Other comments on
7 environmental analysis?

8 (No response)

9 MR. BROOKMAN: I see none. I think that --
10 those are the items that we have listed on the agenda
11 as being what we intended to cover in this workshop
12 today. So, from my perspective as facilitator I'm
13 going to end the day and turn it back to Cyrus. And
14 I'll just say from -- speaking from my perspective,
15 thanks to all of you for staying focused, being
16 productive, and covering a lot of ground here in a
17 short amount of time today. So, my congratulations and
18 thanks to you. And, Cyrus Nasserri.

19 MR. NASSERI: Thank you very much. And it
20 was a very productive day. Obviously, we have heard
21 many comments from you and we are looking forward to
22 see your written comments by August 17th and reviewing
23 the report the court -- the transcripts of the court
24 report and also the comments received by 17th of
25 August. We are going to fine-tune our analyses,

1 obviously, accordingly and will start proceeding with
2 our work toward publication and what is needed for
3 advance notice of proposed rule that we said we were
4 going to do this by the end of next year -- toward the
5 end of next year. I think we said December, sometime
6 December 2002.

7 I think what we -- we probably do as we go
8 through this phase of analyses, we have our Web site
9 which we might be able to -- I don't know what legally
10 and how far we can -- what we can put on the -- on the
11 Web site, but we'll try to provide that analyses,
12 whatever is necessary, whatever is needed, and you are
13 welcome to look at that. Again, I don't know what the
14 legal aspects of that is since we're in a rulemaking
15 and what we can provide you before we go and publish
16 notice in the "Federal Register" which is under ANOPR.

17 Again, it was very productive and very -- I
18 really appreciate your participation and -- and the --
19 basically, we're going to use your comments, what you
20 provided to us today. And if you're traveling back
21 home, have -- you know, have a safe -- I don't know if
22 you have any -- if you're getting the plane, you don't
23 have that much of a control over what the pilot's going
24 to do, but hopefully, have a safe trip.

25 PARTICIPANT: You can choose a plane with

1 smoke level 1.

2 (Laughter)

3 (Simultaneous discussions)

4 MR. NASSERI: Yes, sure. I think you have to
5 have final -- anybody has the closing remarks from any
6 -- still have another hour and a half.

7 (Simultaneous discussions)

8 MR. BROOKMAN: Pardon me, everybody. I
9 thought we were finished with the comments but we have
10 one or two more questions or comments.

11 Yes?

12 MR. DEMPSEY: Sorry to drag this on, Cyrus.
13 Dan Dempsey, Carrier.

14 One -- one area we haven't talked about today
15 is the test procedure. As you well know, there's a
16 number of changes being considered by the ASARAE 103
17 committee. And who knows when that will be completed
18 in terms of a revised standard. But what's your plan
19 on addressing the changes that are in process with
20 ASARAE 103?

21 MR. NASSERI: As I mentioned, the process
22 improvement, we said that we have to have a test
23 procedure in place in a -- in the NOPR phase, before
24 the NOPR phase of the analyses. If these changes are
25 in such a way that -- that ASARAE -- I think you're

1 referring to ASARAE Standard 103 -- is basically
2 revised and is go through the ASARAE process of public
3 review and so forth and there is certain things that we
4 can basically adopt, what we can do, we have the 103 in
5 our test procedure, obviously. What we need to do is
6 just go ahead with the notice of -- of revising and
7 adopting the latest version of that if there is
8 anything that we can go and take completely from that
9 standard.

10 And -- but again, we have to go ahead and we
11 have to see what a general counsel advise on that, but
12 we have to basically go ahead and do the -- kind of the
13 -- maybe a -- maybe a short circle -- short -- short
14 cycle rulemaking on a test procedure and adopt those.

15 MR. DEMPSEY: And a follow-up question
16 pertains to the chain -- this is important if we're to
17 consider electrical consumption. But the changes made
18 to one -- to the test -- sorry. To the Department of
19 Energy procedure that were made in 1997, there were
20 changes made in the way that you calculate annual
21 electrical consumption. And as you know, there's been
22 some discussion from GAMA to DOE questioning the
23 technical validity of some of those changes. And as
24 yet we really haven't resolved that and so we have a
25 concern in terms of the -- not the ASARAE 103 procedure

1 but the changes made by the Department in 1997 as it
2 pertains to calculating annual electrical consumption.

3 MR. NASSERI: I think I recall your -- your
4 comments a few years back and then we had some kind of
5 a correspondences, e-mail exchange between us. And I
6 -- I welcome your written comments on that again. And
7 as a part of this -- the comment period for this rule
8 we would basically revisit that comment and either get
9 in -- get back in touch with you and study what -- how
10 we're going to resolve that.

11 MR. BROOKMAN: Michael, did you wish to make
12 another point?

13 MR. MARTIN: A related point. ASARAE
14 Standard 124 for combined appliances is in the very
15 same situation. There is an existing standard that is
16 perfectly usable but there is also a committee going
17 through the routine revision. And if that happens and
18 we beat DOE on -- maybe it can get slipped in. But
19 there is an acceptable test method and just as there is
20 an acceptable test method for furnaces and boilers.

21 MR. MARGOLIS: Eugene Margolis, DOE. Dan,
22 there's always the provision in the rule -- in the
23 statute that you can petition DOE for -- to amend the -
24 - the test procedure rule. So, I'm saying you have
25 your way you want something done in the test procedure,

1 DOE doesn't do it. If you petition us, then we have to
2 hold -- we'll hold a hearing.

3 MR. BROOKMAN: Jim Ranfone?

4 MR. RANFONE: Yeah, Jim Ranfone, AGA.

5 Just a follow-up question on the combination
6 space heater-water heater. There is -- I guess the 124
7 standard has not been promulgated yet for public review
8 as far as I know.

9 MR. MARGOLIS: That's correct.

10 MR. RANFONE: Okay. The question I have,
11 though, is when you looked at product classes and
12 you're considering this product, oil and gas
13 combination, is there a threshold that -- that DOE
14 looks at to say, well, the market is really not there.
15 There's less than 20,000 or 40,000 units shipped per
16 year so at this point in time we really shouldn't take
17 that into consideration as a product class? That's
18 sort of a bottom line question I have.

19 I know you've got it down there as a product
20 class and I'm not saying we should -- you know, we're
21 for it or against it. But since it is such a small
22 portion of the market, does DOE have any kind of
23 criteria or does the legislation say products under a
24 certain amount of total energy usage are not considered
25 or shouldn't be considered as a product class? And if

1 that's the case, then maybe you should invoke that at
2 this point and just move on to the -- to the major
3 issues. But if it isn't the case, then proceed with
4 it.

5 MR. NASSERI: Yes, I think we can -- I think
6 the issue in this -- on this combination was basically
7 the test procedure was the first -- that we don't have
8 a DOE test procedure. We did not go one step further
9 and find out if this -- what's the energy savings or
10 what basically usages or what you're asking.

11 But I think there is a -- there is a -- in
12 the legislation there is a certain energy usage that
13 determines what product we should consider and what
14 product we should not consider and that number is,
15 Carl?

16 MR. ADAMS: Well, I don't have -- this is
17 Carl Adams. I was going to say that I don't know if
18 it's applicable. This is for adding new products, so
19 this is sort of in between because this is not really a
20 new product. It's a combination of two existing
21 products.

22 But there is -- I think the threshold is 100
23 kilowatt-hours per year or equivalent and then there's
24 an aggregate number of -- I don't remember what it is.

25 MR. RANFONE: 4-point-something.

1 MR. ADAMS: Whatever -- you know. So
2 whatever --

3 MR. RANFONE: Well, --

4 (Laughter)_

5 MR. ADAMS: Whatever it is. There is an
6 aggregate for -- for the products in total on an annual
7 basis. So, that perhaps could be used as a decision
8 whether or not to include this class or not.

9 MR. RANFONE: That's fair enough.

10 MR. MARGOLIS: But no decision has been made
11 and no -- and no decision has been even really looked
12 at.

13 MR. BROOKMAN: That was Eugene Margolis.
14 Michael Martin?

15 MR. MARTIN: Yes. I've struggled with this
16 in California and I concluded there is no product class
17 that you cannot subdivide into small enough
18 subdivisions that you end up with a whole bunch of
19 stuff that is insignificant. And it makes much more
20 sense to look at the whole class and include some items
21 that are in competition with the major ones but in
22 themselves are not very big. So I -- I would certainly
23 recommend that we include those combination units in
24 this rulemaking as part of the existing significant
25 class.

1 MR. BROOKMAN: Jim Crawford?

2 MR. CRAWFORD: Jim Crawford, Trane. I don't
3 have a dog in this fight, so.

4 I -- I think that two things have to be kept
5 in mind. Number one, we've got a very long time
6 horizon with this particular rulemaking process and
7 that's a little bit different than what we're used to.
8 And I think that -- that we ought to invite the
9 advocates for the systems under discussion to put forth
10 any information that they would like to relative to
11 what has been happening in the market and what they --
12 what they think is likely to happen in the market for
13 consideration in the -- in the process.

14 MR. BROOKMAN: Thank you.

15 MR. MARGOLIS: But then -- Eugene Margolis.
16 But there must be at the time of the NOPR a test
17 procedure that would apply because if we don't have a
18 test procedure we cannot have any standards.

19 MR. CRAWFORD: Well, being an engineer, I
20 don't want to worry about the law yet until I find out
21 whether there's a practical problem to be addressed.
22 And -- and then if there is, I'm sure that we
23 collectively -- that the industry, the utilities,
24 ASARAE will find a solution.

25 MR. BROOKMAN: This is Jim Crawford --

1 MR. MARGOLIS: In a timely -- in a timely
2 manner.

3 MR. CRAWFORD: Always.

4 MR. MARGOLIS: Actually, yes.

5 MR. BROOKMAN: Michael Martin?

6 MR. MARTIN: Yes. The test method was
7 adopted by ASARAE in 1991. It's currently being used
8 by GAMA in their directory and we're shortly here to be
9 collecting information in California's database. So
10 there is a -- an existing test method. What it needs
11 is to have DOE to make a reference to it. That's
12 making it a DOE test method. But it does exist.

13 MR. BROOKMAN: Okay. Cyrus?

14 MR. NASSERI: Yes. As I said and I repeat,
15 this is something that we have to look at and see what
16 our staffing and funding is for the -- again, it's
17 going to be a rule. Might not be a very extensive rule
18 or not as expensive as some other rules, but we have to
19 basically review -- review your comments -- especially
20 in written. And you are on the record for today. And
21 we look at the nature of the -- the fact that we're
22 going to go through the rulemaking for test procedure
23 for combination appliances, obviously, referencing the
24 -- the already established ASARAE standard and so
25 forth.

1 And if you do that prior to the other phase
2 of NOPR, they'd be able to basically fulfill the
3 process improvement requirements and be able to
4 consider this product as a class.

5 MR. BROOKMAN: Michael Martin?

6 MR. MARTIN: One last question. You gave us
7 a timeline. Is that subject to public comment, too?
8 Or somebody --

9 MR. NASSERI: I think the public can comment
10 on anything we propose. There's no limitation to what
11 we say. If you say it should be shorter than what we
12 have or longer, obviously you have to give it bearing
13 to draw attention.

14 MR. MARTIN: But you chose an effective date
15 but gave no rationale for why it was --

16 MR. NASSERI: Well, this --

17 MR. MARTIN: -- so far ahead.

18 MR. NASSERI: Well, this -- this timeline
19 goes back to the process improvement that we said from
20 each phase we need roughly one year from this phase to
21 the next phase. And I think there were certain thing
22 in the process improvement that we are basically going
23 by that.

24 MR. MARTIN: You've got a long period between
25 the adoption date and the effective date.

1 MR. NASSERI: Mm-hmm.

2 MR. MARTIN: Which you didn't discuss. You
3 just told us.

4 MR. NASSERI: I think that goes back to the
5 way that the original EPCA was established. If you go
6 back to the EPCA there was a long period within the --
7 the publication of final rule and basically the
8 effective date of the standard, which was eight years,
9 as I recall, for furnaces and boilers. So we are
10 basically keeping that. If that's something that
11 basically is -- you want to comment on, obviously that
12 -- you will comment at your --

13 MR. MARTIN: We can both look it up and see
14 who's right.

15 MR. BROOKMAN: Carl?

16 MR. ADAMS: Just a follow-up on --

17 MR. BROOKMAN: Carl Adams, yes.

18 MR. ADAMS: Carl Adams. A follow-up on the
19 time period. The statute doesn't say eight years. The
20 statute says we were supposed to have a final rule in
21 1994 for products manufactured on or after 2002, which
22 is eight years, and we've basically sort of preserved
23 that.

24 However, I would just at this point make a
25 pitch that if there were to be a joint comment amongst

1 the various stakeholders proposing to the Department
2 certain standard levels that when this has happened in
3 the past that the timing of the standard level has also
4 been subject to this negotiation or agreement among the
5 stakeholders. So if people got together and said
6 here's a standard and we could implement it in six
7 years or five years or whatever, that is something that
8 -- that -- that could be done if everyone agreed to it.
9 We're not absolutely locked in to that time period.

10 MR. MARTIN: Thank you. That's very helpful.

11 MR. BROOKMAN: Joe Mattingly?

12 MR. MATTINGLY: Joe -- you're not locked into
13 that time period if there were an agreement of the kind
14 you described. If there were not such an agreement you
15 are locked in by statute.

16 MR. MARGOLIS: Locked into the eight years?

17 MR. BROOKMAN: Gene, please use the
18 microphones.

19 MR. MARGOLIS: Eugene Margolis, DOE. The
20 eight -- that is what we would do. We'll look at the -
21 - at the statute and see what their time period was.
22 Since we have passed it, we can cut it shorter or make
23 it longer. But usually we try to fulfill the statute
24 as it was originally written.

25 MR. MATTINGLY: Well, Gene, we -- we did this

1 in the water heater rulemaking too and I -- I got
2 shafted on that one. I'm not going to let it happen
3 again. We had this argument about -- about effective
4 dates and I think Francine remembers that. And you
5 can't have it both ways. You had it your way in the
6 water heater rule and you're going to have it this way
7 in the water heater rule. It works in my favor this
8 time, against me in the water heater one.

9 MR. BROOKMAN: That was Joe Mattingly, that
10 last comment.

11 Jim Crawford?

12 MR. CRAWFORD: Jim Crawford. Just for those
13 who are fortunate not to have been down this road
14 before, all of the analysis that we saw today will be
15 done regardless if we agree tomorrow afternoon as to
16 what the timing and the date should be or the level
17 should be.

18 MR. MARTIN: Agreed.

19 MR. BROOKMAN: So, final comments? This
20 extended comment and question period I thought was very
21 useful, so thanks for making sure we did this, these
22 summary comments and questions about the larger
23 process.

24 Cyrus, then I will turn it back to you.

25 Please fill out the evaluation forms. We

1 read them. They're very useful to us. We try every
2 time to make this meeting better every single time. So
3 --

4 MR. NASSERI: Well, I think I said enough for
5 the closing remarks and I'm not going to say anymore.
6 And thank you very much and see you in next workshop.

7 MR. BROOKMAN: Thank you.

8 (Whereupon, at 3:53 p.m., the workshop was
9 concluded.)

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