

U.S. DEPARTMENT OF ENERGY
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ENERGY CONSERVATION STANDARDS FOR COMMERCIAL
AND INDUSTRIAL FANS AND BLOWERS

+ + + + +
PUBLIC MEETING

+ + + + +
THURSDAY
FEBRUARY 21, 2013
+ + + + +

The Public Meeting met in
Room 8E-089, 1000 Independence Avenue, S.W.,
Washington, D.C., at 9:00 a.m., Doug Brookman,
Meeting Facilitator, presiding.

PRESENT:

DOUG BROOKMAN, Meeting Facilitator, Power
Solutions, Inc.

JOHN CYMBALSKY, Department of Energy

BETSY KOHL, Department of Energy

CHARLES LLENZA, Department of Energy

ALSO PRESENT:

KARIM AMRANE, Air-Conditioning, Heating, and
Refrigeration Institute

GOPAL BANDYOPADHYAY, Pacific Northwest
National Laboratory

ROBERT BOTELEER, Principal Confluence Energy,
LLC

DONALD BRUNDAGE, Southern Company

MARK BUBLITZ, New York Blower Company

ANDREW deLASKI, Appliance Standards
Awareness Project
PAUL DOPPEL, Mitsubishi Electric
JORDAN DORIA, Ingersoll Rand
GARY FERNSTROM, California Investor Owned
Utilities
AARON GOTHAM, Greenheck Fan Corporation
DAN HARTLEIN, Twin City Fan
ARMIN HAUER, ebm-papst, Inc.
MICHAEL IVANOVICH, AMCA International
SANAEE IYAMA, Lawrence Berkeley National
Laboratory
SAMUEL JASINSKI, Navigant Consulting
CHARLES KIM, Southern California Edison
Company
TIM KUSKI, Greenheck Fan Corporation
CHRISTOPHER LAU, Navigant Consulting
ALEX LEKOV, Lawrence Berkeley National
Laboratory
ETHAN ROGERS, American Council for an
Energy-Efficient Economy
STEVE ROSENSTOCK, Edison Electric Institute
ANIRUDDH ROY, Air-Conditioning, Heating, and
Refrigeration Institute
ZIKA SREJOVIC, Twin City Fan
WADE SMITH, Air Movement and Control
Association
LOUIS STARR, Northwest Energy Efficiency
Alliance
MARK STEVENS, Air Movement and Control
Association
DANIEL TROMBLEY, American Council for an
Energy-Efficient Economy
GREG WAGNER, Morrison Products, Inc.
MEG WALTNER, Natural Resources Defense
Council
DETLEF WESTPHALEN, Navigant Consulting
DAVID WINIARSKI, Pacific Northwest National
Laboratory
DAVID WINNINGHAM, Allied Air Enterprises

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

(9:02 a.m.)

FACILITATOR BROOKMAN: Good

morning, everyone, and welcome. This is the U.S. Department of Energy's public meeting on energy conservation standards for commercial and industrial fans.

Today is Thursday, February 21, 2013, here at the Forrestal Building, the U.S. Department of Energy.

So glad you could join us this morning. My name is Doug Brookman from Public Solutions in Baltimore. I'll be facilitating the meeting today.

We are going to start off this morning with welcoming remarks from Charles Llenza.

MR. LLENZA: I welcome you to the framework meeting for commercial, industrial, and -- commercial and industrial fans and blowers. And this is our first meeting kicking off the rulemaking here at the

1 Department of Energy.

2 So it is -- it won't be as long as
3 yesterday's pump meeting, hopefully, but we
4 still have a considerable amount of slides to
5 cover. And so let's get on with the --

6 FACILITATOR BROOKMAN: Okay.

7 MR. LLENZA: -- meeting.

8 FACILITATOR BROOKMAN: It's our
9 tradition to start with introductions. I'll
10 start to my immediate left. Please say your
11 name and organizational affiliation. It also
12 gives you a chance to get used to turning
13 these microphones on and off. Please.

14 MR. KUSKI: My name is Tim Kuski.
15 I'm with Greenheck Fan, and I'm here
16 representing AMCA.

17 MR. HARTLEIN: My name is Dan
18 Hartlein. I'm with Twin City Fan Companies,
19 Limited, also representing AMCA.

20 MR. STEVENS: I'm Mark Stevens.
21 I'm with Air Movement and Control Association,
22 AMCA.

1 MR. BUBLITZ: Good morning. Mark
2 Bublitz with the New York Blower Company, also
3 representing AMCA.

4 MR. IVANOVICH: Michael Ivanovich
5 with AMCA International.

6 MR. BOTELEER: Rob Boteler with
7 Confluence Energy, and I'm helping AMCA.

8 MR. deLASKI: Andrew deLaski with
9 the Appliance Standards Awareness Project.

10 MR. FERNSTROM: Gary Fernstrom
11 representing the California Investor Owned
12 Utilities, which are PG&E, Southern California
13 Edison, San Diego Gas & Electric, and the
14 Southern California Gas Company.

15 MS. WALTNER: Meg Waltner, National
16 Resources Defense Council.

17 MR. ROSENSTOCK: Steve Rosenstock,
18 Edison Electric Institute.

19 MR. WINNINGHAM: Dave Winningham,
20 Allied Air Enterprises.

21 MR. ROGERS: Ethan Rogers, American
22 Council for an Energy Efficient Economy.

1 MS. KOHL: Betsy Kohl, Department
2 of Energy, General Counsel's Office.

3 MR. LLENZA: Charles Llenza,
4 Project Manager for the Department of Energy
5 on this rulemaking.

6 MR. CYMBALSKY: John Cymbalsky,
7 Project Manager for Appliance Standards and
8 Building Codes.

9 FACILITATOR BROOKMAN: Thank you.
10 Detlef, please stand up.

11 MR. WESTPHALEN: Detlef Westphalen,
12 Navigant Consulting.

13 MR. JASINSKI: Sam Jasinski,
14 Navigant Consulting.

15 MR. LEKOV: Alex Lekov, Lawrence
16 Berkeley National Laboratory.

17 MS. IYAMA: Sanaee Iyama, Lawrence
18 Berkeley National Lab.

19 MR. BANDYOPADHYAY: Gopal
20 Bandyopadhyay, Pacific Northwest National
21 Laboratory.

22 MR. WINIARSKI: I'm David

1 Winiarski, Pacific Northwest National Lab.

2 (Off-mic introductions.)

3 FACILITATOR BROOKMAN: Did we miss
4 anyone?

5 (No response.)

6 Okay. And those of you that are
7 joining us via the web, welcome. We're glad
8 to have you with us as well.

9 Each of you -- everyone I believe
10 received a packet of information as you
11 checked in this morning. I'm going to do a
12 very brief agenda review.

13 We have already had a brief welcome
14 from Charles and introductions. Immediately
15 following this agenda review, there is an
16 opportunity for anybody that wishes to do so
17 to make brief summary remarks -- brief summary
18 remarks -- surrounding issues that are
19 important to you that you would like to
20 emphasize here at the outset.

21 There is a lot of content that is
22 contained in the packet. These PowerPoint

1 slides, which will be the basis for both
2 presentation, review, and comment as the day
3 goes on, that is the place to really
4 concentrate and focus your comment. However,
5 we do want to provide an opportunity to raise
6 issues here at the outset.

7 Immediately following that opening
8 statement segment, we will have an
9 introduction and rulemaking process overview;
10 and following that, authority, definitions,
11 and regulatory options. We will take a break
12 mid-morning, around about 10:30 or so.

13 Following the presentation and
14 discussion on regulatory regimes, and then
15 test procedures and efficiency metrics, and
16 then market and technology assessment and
17 screening analysis. We will take lunch
18 midday, around about 12:00 or 12:30 or so,
19 whenever we get there.

20 And then, when we return from
21 lunch, engineering analysis, markups analysis,
22 energy use analysis, life-cycle costs and

1 payback period analysis. We will take a break
2 mid-afternoon, whenever it's appropriate.

3 And then, following the break,
4 shipments analysis, national impact analysis,
5 preliminary manufacturer impact analysis, NOPR
6 analyses, and then, finally, at the end of the
7 day, some next steps and another opportunity
8 for you to raise issues that you don't think
9 have been adequately covered.

10 You will have two opportunities in
11 addition to your comment ongoing during the
12 day itself. Okay. So let's make sure you
13 have your opportunity to present the stuff
14 that is important to you.

15 Questions and comments about the
16 agenda? I see -- I see none at this point.

17 MR. LLENZA: I have one comment.

18 FACILITATOR BROOKMAN: Okay.

19 MR. LLENZA: The schedule in here
20 is incorrect. There is another section before
21 the test procedures and efficiency metrics,
22 which has to do with the -- what's that

1 section called? Regulatory regimes. That's
2 correct. So this went to production early, so
3 we couldn't -- I couldn't make the correction.
4 I just want to make a pen-and-ink correction
5 at this point.

6 FACILITATOR BROOKMAN: Okay. Well,
7 so then, if you will pen the correction for
8 me --

9 MR. LLENZA: That's correct. In
10 the handout it's correct. In the presentation
11 it has not been updated.

12 FACILITATOR BROOKMAN: Great.
13 Thank you. That's helpful. Okay. And so,
14 also, I would ask for your consideration --
15 many of you were here yesterday, and many of
16 you have participated in these meetings
17 previously. If you would each speak one at a
18 time, please say your name for the record.
19 You'll have to turn the microphone on and off
20 as you have already gotten used to.

21 If you could keep -- as you say
22 your name for the record, it is important

1 because there will be a complete transcript of
2 this meeting, and that will be made available
3 to you.

4 Keep the focus here. Please turn
5 your cell phones on silent mode; limit sidebar
6 conversations. If you could try to be
7 concise, there is a lot to be said here. We
8 need to share the air time.

9 And webinar participants, let me
10 welcome you especially. The Department of
11 Energy is trying hard to make these meetings
12 accessible to folks via the web. If you would
13 please keep your telephone on mute, and using
14 your software, if you wish -- you should raise
15 your hand if you wish to ask a question or
16 comment, and then we will fit you into the
17 conversation as best we can, and you should be
18 miked live into this meeting room right here
19 at the Forrestal Building. At least that's
20 the way it has been working in the past.

21 So that is the preliminary stuff.
22 Let's start with brief summary remarks about

1 key issues and concerns from anybody that
2 wishes to do so. Who would like to start?
3 Would you like to start, Michael?

4 MR. IVANOVICH: Yes, sir. This is
5 AMCA's first opportunity to testify in a
6 public hearing, so thank you very much for
7 that opportunity.

8 FACILITATOR BROOKMAN: Please say
9 your name for the record.

10 MR. IVANOVICH: Michael Ivanovich,
11 Director of Strategic Energy Initiatives with
12 AMCA International. And on behalf of AMCA
13 International and its members, I'd like to
14 thank DOE for the opportunity to share our
15 ideas on DOE's fan and blower framework
16 document.

17 AMCA International is a not-for-
18 profit international association on air system
19 equipment manufacturers, primarily fans,
20 louvers, dampers, and air curtains used in
21 residential and commercial buildings and
22 industrial and utility processes. AMCA was

1 founded in 1917 and now has 306 members. Of
2 these, 125 member companies manufacture fans
3 for sale in the United States. And of these,
4 all but seven are located in North America.

5 Approximately 80 percent of AMCA
6 members are small firms, which have annual
7 revenues under \$10 million, and 97 percent
8 have annual revenues under \$50 million.
9 AMCA's mission is to promote the health,
10 growth, and integrity of our industry,
11 consistent with the public interest.

12 Commitment to our mission is
13 evidenced through developing and maintaining
14 foundational ANSI-accredited test standards,
15 an international certified ratings program, a
16 world-class laboratory, and our own
17 international laboratory accreditation
18 program.

19 In keeping with our mission, AMCA
20 responded to the Notice of Proposed
21 Determination published in June 2011 that we
22 concur DOE has the authority to regulate

1 commercial and industrial fans, and that we
2 would like to collaborate in the rulemaking.

3 Our position is to work with DOE on
4 a fan -- fan regulation is consistent with our
5 leadership in energy efficient fan systems.
6 In 2010, AMCA published a standard, ANSI AMCA
7 205, for rating the efficiency of a fan. And,
8 in 2011, we championed the insertion of a fan
9 efficiency requirement based on AMCA 205 and
10 to the 2012 International Green Construction
11 Code.

12 In 2012, we led the establishment
13 of a fan efficiency requirement based on AMCA
14 205 for ASHRAE 90.1 2013.

15 We are currently co-sponsoring a
16 code change proposal to the 2015 International
17 Energy Conservation Code that also inserts a
18 fan efficiency requirement, and AMCA is
19 developing a continuous maintenance proposal
20 for ASHRAE 189.1, the high performance green
21 construction standard. All of these efforts
22 amount to years of consensus-building and

1 public peer review.

2 AMCA's contribution on the DOE
3 rulemaking extends to working with advocates
4 on a joint proposal to DOE which could inform
5 them of what a fan efficiency regulation could
6 look like, and this includes working closely
7 with ACEEE, ASAP, and the National Resources
8 Defense Council, and other advocates.

9 But despite the considerable talent
10 available, this regulation won't be easy.
11 AMCA and its members believe that caution is
12 needed. Fans of commercial and industrial
13 scale are extremely complex. There are many
14 types of fans on the market to meet the
15 diverse needs of fan applications, and the
16 behavior of fans is highly sensitive to proper
17 sizing and selection practice, as well as
18 installation and operation. There are many
19 opportunities for unintended consequences.

20 AMCA has reviewed -- okay. So,
21 consequently, AMCA's fan efficiency standard
22 not only defines how to rate a fan's

1 efficiency; it also requires that fans be
2 sized and selected to operate within 15
3 percentage points of their peak efficiency.

4 In other words, the AMCA 205
5 standard seeks to impact the design community,
6 not just the manufacturing community. And all
7 current and proposed codes and standards for
8 the fan efficiency language written around
9 AMCA 205 adopts the sizing and selection
10 requirement.

11 AMCA has reviewed the framework
12 document in some detail and commends the
13 considerable effort and talent that went into
14 it. We do have questions and proposed changes
15 about the scope, equipment classes, and
16 efficiency metrics.

17 In this presented framework, we
18 found areas where potential energy savings can
19 be easily compromised by conventional
20 practice, and we also found that there will be
21 areas where there could be considerable undue
22 regulatory burden on small businesses, and we

1 look forward to talking to you about these
2 issues today. And, again, thank you very
3 much.

4 FACILITATOR BROOKMAN: Thank you.
5 Other issues here at the outset? Andrew
6 deLaski.

7 MR. deLASKI: Andrew deLaski,
8 Appliance Standards Awareness Project. I want
9 to also thank the Department for initiating
10 this rulemaking. As the Department has shown,
11 fans use a considerable amount of energy. On
12 a national basis, about six and a half percent
13 of electricity consumption is used to power
14 fans according to the data presented in the
15 RFI.

16 So there are significant
17 opportunities here. Even small improvements
18 in fan efficiency offer the potential for
19 significant savings on a national basis, even
20 as you start to carve down to product classes
21 that make sense, coming up with a set of fans
22 that make sense for a standard.

1 So we think this is a very
2 promising endeavor for the Department, for
3 delivering cost effective energy efficiency
4 savings, and we appreciate DOE's work to get
5 it off the ground.

6 I also want to thank AMCA, Michael
7 and the team at AMCA, and the manufacturers
8 who reached out to us early -- very early in
9 this process after the RFI was published to
10 begin a relationship to help to educate us,
11 the advocacy community, about fans to improve
12 upon our existing base of knowledge about the
13 opportunities and also the constraints in
14 improving fan efficiency through standards.

15 As you've indicated to DOE in a
16 letter that we sent last fall jointly with
17 AMCA, it is our ambition to work with AMCA and
18 the manufacturer to come up with a joint
19 recommendation. We are in the very infancy
20 stage of that process, but that is our
21 ambition. And that joint recommendation, as
22 Michael has indicated, we would hope could

1 help form the basis for a DOE regulation
2 eventually.

3 We have only just begun this work.
4 DOE's framework document helps to frame the
5 key issues.

6 With respect to the key issues that
7 are outlined in the framework, characterize
8 them as scope and exemptions, product classes,
9 the approach for standards, test methods.
10 These are all the critical issues. Indeed, we
11 have done an excellent job of outlining them
12 with the work that has gone into the framework
13 and appreciate the time and effort that has
14 gone into that.

15 Our views on these issues are still
16 forming. We look forward to learning more
17 today, in the weeks ahead, and in
18 participating actively in the discussion today
19 and beyond.

20 FACILITATOR BROOKMAN: Thank you,
21 Andrew.

22 Other comments here at the outset?

1 Please. Please say your name for the record.

2 MR. ROY: My name is Aniruddh Roy,
3 Air-Conditioning, Heating, and Refrigeration
4 Institute. We would like to know on what
5 basis DOE developed the framework document for
6 commercial and industrial fans and blowers?
7 Currently, there are requirements in place
8 within ASHRAE Standard 90.1 for fans and HVAC
9 applications.

10 For example, there is a Section
11 6.5.3 that effectively limits power
12 consumption per CFM. The framework document
13 seems to suggest that there are no existing
14 requirements for fans in HVAC applications.
15 And the only mention of ASHRAE Standard 90.1
16 in the framework document, which is about 78
17 or 79 pages, is during the discussion of the
18 FEG requirements in Addendum U.

19 However, the framework document
20 fails to mention any of the exceptions that
21 are mentioned in that addendum as well.

22 DOE, as far as we know, is required

1 by the Energy Conservation and Production Act,
2 to review the latest revision of ASHRAE
3 Standard 90.1, and determine whether the
4 revised code would improve energy efficiency
5 in commercial buildings.

6 If the determination is positive,
7 states must, no later than two years after the
8 date of publication of such affirmative
9 determinations, certify that they have
10 reviewed and updated the provisions of the
11 commercial building codes to meet or exceed
12 the requirements of ASHRAE 90.1.

13 We feel that in the course of
14 reviewing ASHRAE Standard 90.1 DOE should not
15 have simply ignored the work that has been
16 done over the years to develop fan
17 requirements by the 90.1 Committee.

18 DOE's energy consumption estimates
19 in the June 28, 2011, Notice of Proposed
20 Determination of Coverage, did not include any
21 analysis on the energy savings that have been
22 achieved through the adoption of ASHRAE

1 Standard 90.1 by states over the years.

2 As far as AHRI is concerned, a
3 regulation on fans and blowers that are used
4 in HVAC applications will simply lead to
5 complications, since such fans and blowers are
6 designed and installed as part of a larger
7 HVAC system rather than stand-alone
8 components.

9 Setting energy conservation
10 standards for such fans and blowers will not
11 ensure an optimized energy savings solution
12 for applied HVAC systems.

13 MR. LLENZA: This is Charles
14 Llenza, Department of Energy. We acknowledge
15 your comments, but we are in the Appliance
16 Standards Group. The Codes Group is a
17 separate group. We will consult with our
18 colleagues in terms of the preliminary
19 analysis.

20 But I also have to state that the
21 ASHRAE standard has a little bit more of a
22 broader range of issues that we do not cover

1 within the Appliance Standards Group. So it
2 is a different forum.

3 We appreciate your comments, but
4 our mission here at the Appliance Standards
5 Group in the Department of Energy is to
6 actually regulate the appliance, not the
7 building, not related to building codes, not
8 related to the structural building itself, but
9 to the actual equipment that comes out of
10 production from a manufacturing facility.

11 But your comments are well taken,
12 and we will be consulting with the Codes Group
13 for any impacts on our rulemaking.

14 FACILITATOR BROOKMAN: As the day
15 proceeds, let's see how and if it intersects.
16 We'll see.

17 Yes. John Cymbalsky.

18 MR. CYMBALSKY: John Cymbalsky,
19 DOE. I guess I manage the Building Codes,
20 too, so maybe I should address this.

21 (Laughter.)

22 So the Department obviously

1 appreciates everything the ASHRAE committees
2 do. We participate actively in ASHRAE 90.1,
3 in particular. However, I think there may be
4 a little confusion as to what ASHRAE does and
5 what DOE appliance standards regulations do.

6 You know, the appliance standards
7 program sets minimum efficiency standards that
8 are federal law. ASHRAE's recommendations are
9 not federal law. However, the Department can
10 look at ASHRAE and compel states to adopt that
11 code through its process.

12 However, this is a separate -- as
13 Charlie said, this is a separate process. We
14 are going to be looking at these fans and
15 blowers separately from the building codes,
16 but relying heavily on what ASHRAE has done.
17 Obviously, that is a big part of the input to
18 this process, so we will not ignore what is in
19 the ASHRAE 90.1. We will not ignore any test
20 methods or anything else that ASHRAE or other
21 organizations may have come up with in this
22 process.

1 So actually I think it's great that
2 ASHRAE has done a lot of good work in this
3 area. That is going to help us move forward
4 on this rulemaking.

5 I will also put in a plug for a
6 meeting we are having next week on Tuesday for
7 a new Federal Advisory Committee that has been
8 formed here at the Department. One of the
9 charges that this new Advisory Committee will
10 have is to form working groups to explore the
11 possibility of negotiated rulemakings for
12 certain products.

13 As both Michael and Andrew have
14 already addressed, that there has been some
15 early conversations as to whether or not this
16 product could be a good one to explore that
17 possibility of a negotiated rulemaking. And
18 we at the Department hope that this is a path
19 that more products will go down as opposed to
20 a notice and comment type rulemaking.

21 The negotiated rulemaking is such
22 that we could have several meetings where we

1 all sit around this table here, and in real
2 time we can negotiate all aspects of the
3 rulemaking. And so we're hoping that the fan
4 manufacturers, and AMCA in particular, will
5 consider this as an option, if in fact the
6 ASRAC committee decides that this product
7 would be a good one to move forward on.

8 So that meeting will take place in
9 this room on Tuesday, February 26th at 9:00
10 a.m.

11 FACILITATOR BROOKMAN: Okay.

12 MR. CYMBALSKY: At 10:00 a.m.,
13 excuse me. 10:00 a.m.

14 FACILITATOR BROOKMAN: Ten.
15 Thanks. Thanks very much.

16 Don Brundage.

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

19 FACILITATOR BROOKMAN: Don, will
20 you leave that thing on, once it's on? Thank
21 you. We should get a piece of tape.

22 MR. BRUNDAGE: I'm a bit confused

1 on the --

2 FACILITATOR BROOKMAN: Don, it's
3 still not on.

4 MR. BRUNDAGE: Now?

5 FACILITATOR BROOKMAN: Yes.

6 MR. BRUNDAGE: Okay. I'm a bit
7 confused on the regulatory scheme we're
8 operating under. The way I had always
9 understood the way the process works, you had
10 residential type or directly -- appliances
11 that were directly listed in federal
12 regulations that were regulated directly by
13 DOE, and then you had the ASHRAE products
14 where DOE was to consider the efficiency
15 levels of ASHRAE, give deference to ASHRAE,
16 and if they decide that there is evidence that
17 the standard needs to be higher, then DOE
18 might set a higher one.

19 What you're saying now is that this
20 is a product that would have the residential
21 type regulation, and you are directly doing it
22 without deference to ASHRAE.

1 FACILITATOR BROOKMAN: John
2 Cymbalsky.

3 MR. CYMBALSKY: Okay. I'm going to
4 be half lawyer/half whatever else I do here.

5 (Laughter.)

6 So you are -- so there are a list
7 of ASHRAE products that, in fact, we follow
8 that process that you just described. This,
9 however, is not one of them. This is under
10 Section 6311 of 42 USC.

11 The types of equipment, blah, blah,
12 blah, blah, blah, but it lists several things
13 that are called out in the statute for us to
14 follow this rulemaking, what you called
15 consumer product type rulemaking --
16 compressors, fans, blowers, et cetera, et
17 cetera, et cetera. So we are operating under
18 this section of the statute, so 6311(2)(B).

19 MR. BRUNDAGE: And 6311(2)(B) does
20 not imply residential and fans, blowers. It's
21 all fans --

22 MR. CYMBALSKY: Correct.

1 MR. BRUNDAGE: -- and blowers?

2 MR. LLENZA: It's commercial.

3 MR. CYMBALSKY: This is commercial
4 and industrial --

5 MR. LLENZA: Right.

6 MR. CYMBALSKY: -- fans and
7 blowers.

8 MR. BRUNDAGE: Okay. Thank you.

9 FACILITATOR BROOKMAN: Okay.
10 Thanks for that clarification. That's
11 helpful.

12 Karim? Karim Amrane.

13 MR. AMRANE: Karim Amrane, AHRI. I
14 would like to respond to John's comment. I'm
15 glad to hear that DOE is going to be looking
16 at ASHRAE 90.1 and the work that ASHRAE 90.1
17 has done. But so far, if we look at all the
18 analysis that was done so far, your RFI, your
19 justification to be here today, you have not
20 accounted for anything that ASHRAE has done.
21 Okay? You are assuming that there is nothing
22 in place today, and there have been

1 requirements on fan for decades in ASHRAE
2 90.1.

3 So what I'm saying, I'm glad to
4 hear that DOE is looking at ASHRAE, but you
5 should be looking at ASHRAE, because there are
6 things in place today.

7 Thank you.

8 FACILITATOR BROOKMAN: Thank you.
9 Okay.

10 So now I'm going to go to Charles
11 Llenza. He is going to provide an overview.

12 MR. LLENZA: Okay. So just a brief
13 introduction here. The purpose of today's
14 meeting is to present our proposed analytical
15 approaches to be used to evaluate the energy
16 conservation standards for commercial and
17 industrial fans and blowers.

18 It is also to inform the interested
19 parties here on -- in terms of what our plans
20 are for the rulemaking, also to facilitate
21 comments from the stakeholders and advocates,
22 also to provide a forum here for public

1 discussion on these issues, and to encourage
2 all parties attending and those attending on
3 the webinar and other parties that have not
4 been able to attend, to provide their
5 information, written comments, and other
6 material, as appropriate.

7 We will be using these blue request
8 comment boxes throughout the process here for
9 specific questions that the Department has.

10 And these are the highlights of what the
11 Department seeks in terms of comments from the
12 stakeholders in terms of particular issues we
13 discuss as we go through the presentation.

14 I may note at this time that the
15 framework document has a whole section on
16 questions that the Department has to the
17 industry, and I would appreciate as much
18 responsiveness from the industry on those
19 comments, not necessarily at this meeting but
20 within the written comment process, and which
21 we have extended the comment period to May
22 2nd, which we understand the complexity and

1 the need for a little bit more time to
2 evaluate the Department's framework proposal.

3 Okay. And we do have a specific
4 way of submitting these comments, and we would
5 like for you to provide a docket number and/or
6 RIN number that is related to this particular
7 rulemaking.

8 We have an electronic email box,
9 which you can submit your comments through, or
10 you could use the postal mail or a courier,
11 but we would prefer the electronic method of
12 delivery.

13 And, once again, I want to
14 emphasize that we have extended the comment
15 period to May 2, 2013, in lieu of the
16 sensitivity of the time needed to review
17 appropriately the framework document.

18 Any questions on this so far?

19 (No response.)

20 Okay. Rulemaking process overview.
21 EPCA, the Energy Policy and Conservation Act,
22 as amended, contains at least 12 types of

1 industrial equipment that are considered
2 covered equipment under the statute, that the
3 Secretary of Energy is authorized to establish
4 energy conservation standards.

5 As John was mentioning, fans and
6 blowers are two of the specific types of
7 industrial equipment that are under the
8 statute 42 USC 6311(2)(B). EPCA also directs
9 DOE to develop new and amended standards
10 designed to achieve maximum improvements to
11 energy efficiency that are technologically
12 feasible and economically justified. And this
13 rulemaking process that the DOE provides --
14 and schedule -- helps us do just that.

15 EPCA directs DOE to consider some
16 factors in the analysis. And as you can see
17 in the first column, those are the EPCA
18 requirements. There are seven of them. And
19 the corresponding DOE analysis is in the
20 right-hand column. And throughout the next
21 three years of the rulemaking, or whatever
22 timeframe it takes, we will be going through

1 that analysis, corresponding analysis.

2 So let me talk a little bit about
3 the rulemaking process timelines. This is our
4 standard timelines. We do have other
5 rulemakings that may be accelerated. There is
6 also a negotiated rulemaking process that John
7 has mentioned that is encouraged by the
8 Department. But this is our standard process
9 based on the statute, and for Fans and Blowers
10 we have -- it is three years.

11 We are at the framework document
12 point. We will have a preliminary analysis
13 after this; a Notice of Proposed Rulemaking,
14 which is a draft rule; and then we will have a
15 final rule published hopefully in the three
16 years..

17 At the same time, there is a test
18 procedure process that is integrated within
19 the timeline of the energy conservation
20 standard rulemaking, but it is a separate
21 process. It parallels the process.

22 Just to mention that the test

1 procedure is key and critical in establishing
2 the metrics for the energy conservation
3 standard. So as part of the integrated
4 rulemaking process for fans and blowers, this
5 is the methodology we would be using here to
6 get both the energy conservation standard and
7 the test procedures processed issued by the
8 Department.

9 The test procedure is usually a
10 year and a half. It depends on the level of
11 complexity. And, again, the rulemaking --
12 energy conservation standard usually takes
13 three years. There is additional information
14 at that website, if you care to look at more
15 detail of the process.

16 I'm going to talk a little bit
17 about these chevrons for the energy
18 conservation standard. Today we are at the
19 framework document. It provides an overview
20 of our rulemaking process and encourages early
21 participation of interested parties, because
22 we are starting at the beginning here of the

1 rulemaking at the Department of Energy.

2 We invite comments at all times of
3 our proposed approach and issues. And we --
4 this is just a listing of the framework
5 document that was -

- issued the notice that was
6 issued in the Federal Register February 1,
7 2013.

8 From the framework process, we will
9 go into preliminary analysis mode. It is
10 planned for quarter -- third quarter of 2014.
11 We plan to have in the Federal Register Notice
12 announcing that process to formally start.
13 They will have another meeting just like we're
14 having today, and you can see that we will
15 provide you a listing of the preliminary
16 analysis that the Department has developed by
17 that timeframe.

18 In addition, we will be discussing
19 your comments received from the framework
20 document and incorporating to the best of our
21 abilities the improvements to the DOE process
22 for the rulemaking.

1 From the preliminary analysis, we
2 will be -- also we will be developing a TSD,
3 technical support document, with all of the
4 material of the data that we utilized to
5 provide the analysis and the analysis itself.

6 From this point, we will go to a
7 Notice of Proposed Rulemaking. Again, that is
8 a draft of what we think the standard levels
9 will be. We will have discussions of the
10 comments received in response to the
11 preliminary analysis and TSD.

12 And it will refine the analysis the
13 Department has provided in the preliminary
14 analysis, and we will have more detail in
15 terms of the levels based on what is
16 economically justified and technologically
17 feasible.

18 And that would be subject to public
19 comments. We will have another meeting, and
20 we are planning to do that in the second
21 quarter of 2015.

22 Okay. So the final rule hopefully

1 will be issued in about three years. The
2 process always incorporates comments from the
3 stakeholders. I think that's critical to keep
4 in mind. We're sensitive to your comments.
5 We will respond to your comments within the
6 documents.

7 And we will make all of the -- any
8 adjustments that we have to make to the
9 technical support documents. And then, once
10 these levels are finalized in the final rule
11 and published, they become the standard. That
12 is planned in the first quarter of 2016.

13 Okay. What does that look like?
14 Here is our comprehensive schedule integrated
15 with the test procedure, so that you can see
16 how the test procedure is linked to the energy
17 conservation standard.

18 We issued the framework document in
19 January 2013, and then today we are having the
20 public meeting. You can see that the next
21 public meeting and major document will be a
22 test procedure NOPR, which is basically our

1 proposal for what the test procedure should
2 look like.

3 And then we will have a preliminary
4 analysis public meeting at some point after we
5 release the preliminary analysis documents in
6 the Federal Register. The test procedure will
7 be finalized somewhere after 2015, and then
8 that will be followed by a Notice of Proposed
9 Rulemaking, which is in the draft rule.

10 We will have another meeting in the
11 second quarter of 2015. And as you can see,
12 the completion date, the final rule.

13 This is the road map for us to how
14 to get from A -- from today's meeting, which
15 opens up the rulemaking, to completion of the
16 mission here at the Department for the
17 rulemaking.

18 Three years later after we have
19 published a final rule, the standards that the
20 Department issues become effective. In other
21 words, there is plenty of time for the
22 industry to get ready for those new standards.

1 And one of the things that we need to keep in
2 mind is that it is not happening overnight.
3 We are talking six years out. Okay.

4 FACILITATOR BROOKMAN: Michael?

5 MR. IVANOVICH: Michael Ivanovich,
6 AMCA International. Could you just discuss a
7 little bit how a joint recommendation or a
8 negotiated ruling would impact these steps?

9 MR. LLENZA: Well, I'm envisioning
10 that parallel to this timeframe for our test
11 procedures and the energy conservation
12 standard rulemaking. You will have another
13 process where the Department and the advocates
14 and the manufacturers and all of the parties
15 of interest are talking to the Department
16 about information needed, that we are
17 providing or information that they may have,
18 in terms of what they think should be
19 regulated, what should be -- what standard
20 level should be used, et cetera.

21 And I would think that as we issue
22 more analysis from the Department that the

1 industry would look at what we are proposing
2 and then use that information that they may
3 have to then propose back to us whatever
4 levels. And John may want to say a few words
5 --

6 MR. CYMBALSKY: Yes. Let me try to
7 clarify it a bit. So a joint recommendation
8 could be submitted, and the Department would
9 consider it as part of this process that you
10 see here. Now, if you wanted to go the
11 negotiated rulemaking path, in that the
12 process would be different than this. We
13 would have meetings that are set.

14 And depending on what the working
15 group -- if the working group is formed, the
16 working group itself sets sort of the
17 schedule, you know, with the Department buy-in
18 obviously.

19 And at that point, any negotiated
20 outcomes that come out of that process would
21 go into a proposal. So it would go into the
22 NOPR in here.

1 So the Department's fallback
2 position would be this, in case the
3 negotiations don't have a fruitful outcome.

4 FACILITATOR BROOKMAN: Right. This
5 process will proceed.

6 MR. CYMBALSKY: Correct.
7 Independently. With the same data and the
8 same -- you know, understanding that we are
9 going to be doing both at the same time. So
10 the same people, you know, the consultants
11 that we rely on to do the lion's share of the
12 analysis here will be in both processes. So,
13 yes.

14 FACILITATOR BROOKMAN: Karim.

15 MR. AMRANE: Karim Amrane, AHRI.
16 To follow up on that, who is going to decide
17 whether there is going to be a negotiated
18 rulemaking? It's going to be this Advisory
19 Committee that is going to make that --

20 MR. CYMBALSKY: Yes. So on Tuesday
21 we are going to -- John Cymbalsky, DOE. On
22 Tuesday we will have our first meeting of this

1 new committee, and at that time the agenda
2 will allow time for proposals of working
3 groups to be formed.

4 I can say that the Department --
5 this is one of the products that has been
6 mentioned, because we have received your
7 letter, and so obviously this is one that on
8 behalf of the Department I could say we are
9 definitely interested in, and hopefully you
10 are as well.

11 FACILITATOR BROOKMAN: Okay. Thank
12 you for that clarification.

13 Charles, let's go. Oh, we have one
14 more question. Your name, please, sir.

15 MR. SMITH: I'm Wade Smith from
16 AMCA.

17 FACILITATOR BROOKMAN: Yes.

18 MR. SMITH: Originally, there was
19 some discussion about a negotiated outcome
20 that involved interested parties from the
21 manufacturers and interested advocates on the
22 environmental side. And from your comment a

1 moment ago, I understand that that path is
2 still available to us, and that the outcome of
3 that discussion/negotiation would inform this
4 process. Have I got that right?

5 So I guess my question is, could
6 you compare and contrast your view in terms of
7 how that process compares to a negotiated
8 process and why the Department is interested
9 in raising the specter of negotiated process
10 at this time?

11 MR. CYMBALSKY: A specter. Okay.

12 (Laughter.)

13 I actually thought it was a good
14 thing.

15 (Laughter.)

16 Okay. So for those who come on
17 Tuesday, I guess I will repeat myself. But,
18 okay, so what ASRAC will do will present
19 options to charter working groups, whereby
20 interested stakeholders could nominate
21 themselves or others to be a member of this
22 working group whose job it will be to

1 negotiate an energy conservation standard or
2 all parts of the standard with DOE's
3 involvement.

4 And what we learned from our first
5 foray into this with transformers, we actually
6 have three types of distribution transformers
7 that we tried to negotiate a standard for. We
8 got one out of three. That's -- I don't know,
9 you get eight million a year in baseball for
10 one out of three, so I'm going to call it a
11 win.

12 (Laughter.)

13 You know, and for what it's worth,
14 there's a few others in this room who were
15 part of that process.

16 Now, we could all say at the end of
17 the day we may not have got to where we wanted
18 to get to, but nobody -- all 25 people in that
19 process agreed that it was far better than the
20 normal notice and comment rulemaking that we
21 do, because in real time people were
22 discussing, hey, how about this level, that

1 level, what if we give here, we get there,
2 what's the numbers that would, you know,
3 surround that outcome.

4 And we'd have our consultants in
5 the room on their laptops in real time
6 producing analysis, and I think having that
7 back and forth over a few days in a row, you
8 know, real concentrated work, I think most
9 people in the room found that a little less
10 black boxy, if you will.

11 All information was out on the
12 table. If you wanted to provide information
13 that was business confidential, or you didn't
14 want it to be disclosed, you could sign these
15 non-disclosure agreements and talk to the
16 consultants in the hallway, and, you know, we
17 would mask that data.

18 But personally I think having a
19 negotiated outcome at the end of the day means
20 after the fact that the chance of litigation
21 is smaller, you know, from the Department's
22 point of view. That's not to say it won't

1 happen. But we think that if everyone in the
2 room and all of the key stakeholders in the
3 room are negotiating and they say yes, we
4 think that's a better outcome than the
5 alternative.

6 So I strongly -- on behalf of the
7 Department, we strongly encourage that
8 process.

9 FACILITATOR BROOKMAN: Andrew
10 deLaski.

11 MR. deLASKI: Just a couple of
12 comments. One is John and Charlie, I mean,
13 you -- I think you made it very clear, you
14 used the word that they are independent of one
15 another.

16 FACILITATOR BROOKMAN: Is your
17 microphone on?

18 MR. deLASKI: Independent. The
19 light -- it's lit up.

20 FACILITATOR BROOKMAN: Okay. Thank
21 you.

22 MR. deLASKI: Maybe it's not close

1 enough. Is that the issue?

2 FACILITATOR BROOKMAN: Yes.

3 MR. deLASKI: All right. You know,
4 in the sense that, as you have just described,
5 this team of consultants is there in the room.
6 You or your designee is there in the room, so
7 the folks who are running the rulemaking, the
8 normal rulemaking if you will, are the same
9 folks who are engaged and supporting the reg
10 neg.

11 Okay. I see you nodding, so I
12 think that's an important -- you know, so my
13 understanding of it is that you still have an
14 obligation and a commitment to follow through
15 on the schedule that Charlie has described.
16 So that is going to happen.

17 But what's happening in the reg neg
18 can't help but to inform what happens there,
19 whether or not we ultimately -- the
20 participants in the reg neg reach a consensus
21 in the end, because if it's not working like
22 that then, you know, we are all going to go

1 away, because it's going to be -- it's like
2 we're going to be frustrated, right?

3 Because what's going to happen is
4 that, the way I would envision something like
5 this would work, is that it would be
6 difficult, I would suspect, to complete this
7 prior to the preliminary technical support
8 document being published.

9 Both time-wise in terms of -- also,
10 information and data-wise, right? Because we
11 -- our deliberations of any committee, it
12 seems to me, would be informed by the analysis
13 that is being developed prior to the PTSD, the
14 preliminary technical support document, and
15 that we are going to be discussing today as we
16 go on, and also by the things that build up to
17 that.

18 So what I would hope would happen
19 -- and I did with respect to the transformer
20 process -- is that there would be more sharing
21 by the Department of its analyses that build
22 up to that PTSD document, enabling us -- and

1 then also an opportunity for the stakeholders
2 to influence what goes -- the product classes,
3 the definitions, the testing, that become the
4 underlying foundation of that PTSD, and that
5 there is -- it's a more iterative process.

6 As opposed to us talking to you
7 here today, submitting comments on May 2nd,
8 and then we wait for however long it is, more
9 than a year, right, to see what comes out of
10 that process. That is more of an ongoing
11 engagement with everybody around the same
12 table. So that is kind of how I --

13 MR. CYMBALSKY: And Andrew is the
14 co-chair of ASRAC, so he has -- he is speaking
15 with authority here, actually.

16 MR. deLASKI: And that -- to me,
17 the difference between this process and the
18 transformer process is that we have more time.
19 In transformers we had to do three --
20 basically three classes in three months, and
21 it was difficult, given that compressed
22 timeframe.

1 FACILITATOR BROOKMAN: Steve
2 Rosenstock.

3 MR. ROSENSTOCK: Steve Rosenstock,
4 EEI. To follow on, I also participated in the
5 process. And one also key difference is in
6 that process we are just only talking about
7 the efficiency standard. There was no
8 discussion -- we didn't have to have any
9 discussions about test procedure.

10 So the efficiency metrics were
11 already established, but this product,
12 unfortunately, right now there is no -- we
13 haven't even defined the efficiency metric
14 yet. So it is kind of hard to talk about the
15 standard when you haven't agreed upon the
16 efficiency metric yet.

17 So in this case, in terms -- again,
18 it unfortunately might be harder -- a higher
19 hurdle in the fact that there is a timing of
20 the test procedure as well as the efficiency
21 standard, because if there is no I'll say
22 draft test procedure by the time of the

1 preliminary analysis, that can make
2 negotiations a little tougher, too, because
3 again you might need -- for this case, you
4 might need to negotiate both the test
5 procedure and the efficiency standard.

6 MR. CYMBALSKY: Yes. I guess --
7 John Cymbalsky, DOE. I guess I should -- you
8 know, I thought I would point it out, that the
9 whole scope of the rulemaking is part of this
10 negotiation. So, obviously, the efficiency
11 metric and product, all of that stuff is sort
12 of on the table to negotiate.

13 And I think if a working group is
14 established for this, personally having been
15 through a bunch of these, I think -- I would
16 just say I -- in my opinion, I think you'll
17 find it more intellectually stimulating to do
18 than --

19 (Laughter.)

20 -- negotiated rulemaking. And I --
21 and, again, I think we were -- we didn't get
22 consensus on the three products for

1 transformers. We did get consensus, 25 out of
2 25, that that process was better than the one
3 Andrew just described a few minutes ago. So
4 --

5 FACILITATOR BROOKMAN: Michael, do
6 you want to -- no? All set. Okay.

7 MR. LLENZA: This is Charles from
8 the Department. I just want to point, if you
9 look at the schedule, that's the plan. The
10 test procedure will be -- the NOPR, at least
11 you'll get a good idea what the test
12 procedure, what we're planning to do with the
13 NOPR and the Notice of Proposed Rulemaking for
14 the test procedure before the preliminary
15 analysis.

16 So usually by the time we're
17 issuing a NOPR for a test procedure we have
18 laid out the test plan.

19 MR. CYMBALSKY: John Cymbalsky,
20 DOE. And I would propose that if in fact a
21 working group is chartered under ASRAC that we
22 would begin work before that first green dot,

1 so that there would be some analysis that the
2 Department is working on prior to publishing
3 any of those documents where there would be
4 input from the working group into the numbers.
5 And I would say that that is not a bad thing,
6 so --

7 FACILITATOR BROOKMAN: Final
8 questions on this subject before we move on?

9 (No response.)

10 Okay. Now back to the content here
11 in the slides and Charles Llenza.

12 MR. LLENZA: Yes. Section 3,
13 authority and definitions. The Department has
14 the authority under EPCA, Title 3, Part C, as
15 amended, set forth, various provisions
16 designed to improve energy efficiency in
17 commercial and industrial equipment.

18 If you look at Section 6311, that
19 is where it talks about it includes fans and
20 blowers. And that is why we have kicked off
21 this rulemaking today.

22 The manufactures must use DOE-

1 prescribed test procedures to establish
2 compliance with the standard sets for
3 commercial and industrial fans. Again, I am
4 just -- this is just emphasizing that the test
5 procedure is an integral part of this process,
6 because the test procedure is what will
7 provide the metrics for us to establish the
8 energy conservation standards.

9 Okay. So definitions. While we
10 don't -- we have the authority, we currently
11 don't have definitions in terms of what -- in
12 terms of what is a fan and what is a blower
13 under the commercial and industrial section
14 here of EPCA.

15 So the Department has proposed a
16 series of definitions. I will just read the
17 headlines, and you can read the definitions in
18 particular. So we have proposed definitions
19 for commercial and industrial fans, for what a
20 fan manufacturer is, what an axial fan is,
21 what a centrifugal fan is, cross-flow fan,
22 mixed flow fan, and what we describe as a

1 blower, and what a safety fan would be.

2 And fan types, inclusion of all fan
3 types, axial, centrifugal, mixed flow, and
4 blowers. And we are looking also at the
5 physical and performance criteria for the
6 standards, so we're looking at the impeller
7 diameter, transmissions of all types, and the
8 rotation speed, speeds up to 8,000 rpm.

9 So the important comment box.
10 Item 2.1, DOE requests data on how fans are
11 sold; 2.2, DOE requests comments on the
12 suggested cross-flow fan definitions; 2/3, DOE
13 requests comments on the suggested blower
14 definitions; 2/4, we request comments on the
15 suggested safety fan definition; and 2/7, DOE
16 requests comments on fan coverage as fans are
17 defined in the framework document.

18 So getting back to the point, this
19 is the beginning of the rulemaking. We are
20 trying to set the foundation of what we're
21 doing here. We have some proposed
22 definitions, and what we are requesting at

1 this point in time is that the advocates and
2 the parties attending this meeting weigh in on
3 those definitions.

4 FACILITATOR BROOKMAN: Okay. So
5 you can see the request for comment. And,
6 first of all, let me ask AMCA directly, do you
7 have data? Have you been collecting data that
8 would be helpful to the Department?

9 MR. IVANOVICH: We have some data,
10 but we would like to thank the Department of
11 Energy for granting the 45-day extension,
12 because upon reviewing the framework document
13 it was obvious that there is a lot more data
14 that we are going to need to answer those
15 questions decisively.

16 So there is a lot -- you know, some
17 data that we have that we will be able to
18 provide as part of the written comments, but
19 there is a lot that we don't.

20 FACILITATOR BROOKMAN: Yes. And is
21 that -- does AMCA typically survey its members
22 to obtain data like -- I mean, is this a

1 convention?

2 MR. IVANOVICH: We have a
3 statistical program that -- it is a voluntary
4 basis, because by law it has to be voluntary.
5 And the reporting is in sales dollars, not in
6 units and things of that nature. So there is
7 a lot of work that we have to do to extract
8 data from our members in a way that the
9 Department can use them.

10 FACILITATOR BROOKMAN: I don't wish
11 to pry, and I don't wish to put you on the
12 spot, but I do want to see -- get sort of a
13 sense of your capacity to get this done.

14 MR. IVANOVICH: Well, it is
15 voluntary. So we are engaging in that process
16 now, and we have high hopes and expectations
17 that we will be able to provide some data to
18 the Department of Energy. That is why we
19 asked for the extension. We have to get it.

20 FACILITATOR BROOKMAN: Okay. Thank
21 you. Yes.

22 MR. LLENZA: I will also -- at this

1 point in time also encourage those parties
2 that make comments about the ASHRAE Committee
3 definitions and other issues that are going on
4 with fans and blowers to weigh in heavily
5 here, so that you can provide the transparency
6 from what is happening in ASHRAE into our
7 rulemaking. It's a great opportunity to, you
8 know, get this started off on the right foot.

9 FACILITATOR BROOKMAN: Great. Gary
10 Fernstrom.

11 MR. FERNSTROM: Gary Fernstrom. I
12 think the generalized issue here is that
13 definitions are important, because they may
14 merit different efficiency level treatments in
15 the regulation. The concern is that the
16 definitions be definitive enough, so that a
17 loophole is not created.

18 To give you an example, years ago
19 DOE set a regulation for incandescent
20 reflector lamps. It turns out that bulbous
21 reflector lamps, a specialized type of
22 reflector lamp, were exempted, and today

1 virtually all of the reflector lamps,
2 incandescent ones that are sold, are bulbous
3 reflector lamps.

4 So that caveat in the definition
5 created a loophole, which effectively made the
6 regulation useless. So we want to be careful
7 in our definition, so that we don't, for
8 example, find a large number of safety fans
9 being sold for other applications creating a
10 loophole.

11 FACILITATOR BROOKMAN: Right.

12 MR. FERNSTROM: Thank you.

13 FACILITATOR BROOKMAN: In just a
14 moment, we are hoping to get your comments,
15 perhaps preliminary comments -- maybe you have
16 developed this -- on these definitions you
17 have. That's good to see.

18 Steve Rosenstock.

19 MR. ROSENSTOCK: Steve Rosenstock
20 Edison Electric Institute. Just a quick
21 follow-up on the definition of safety fan.
22 And, again, the following slide is -- is the

1 idea to exempt safety fans from the regulation
2 just because of low operation hours and very
3 specific requirements for those fans? And
4 then I have a follow up.

5 FACILITATOR BROOKMAN: Charles?

6 MR. LLENZA: I think the issue with
7 safety fans, again, is the word "safety."
8 Some of these fans are not designed to be most
9 efficient, but they may be designed to blow
10 out air or material in order to preserve life.

11 So at that -- you know, I think we
12 have issues with safety, safety equipment,
13 that we would not subject them to necessarily
14 to any kind of regulatory regimen, because
15 they are not -- they are not the normal fans,
16 they are not the normal equipment fans.

17 They have to perform maybe to a
18 higher grade of efficiency, but not
19 necessarily in the most efficient manner. So
20 --

21 MR. ROSENSTOCK: Okay. Steve
22 Rosenstock, EEI. I appreciate that, and, you

1 know, I'm especially thinking of like for
2 commercial buildings you have the smoke
3 exhaust fans and the pressurization fans, fans
4 that are designed for emergency conditions
5 only, where they are only going to operate
6 maybe once a month for code compliance tests
7 to make sure they're working, or in the case
8 of a real emergency, and that's it. So
9 they're operating maybe two hours a year or
10 not -- you know, maybe six hours a year, half
11 an hour a month or something like that. So I
12 would agree with that.

13 My other question -- my other
14 thought -- my question -- again, it's a
15 definition, so it's kind of getting in the
16 weeds, is you just said right here under axial
17 or centrifugal fan, are there other types of
18 fans used in these environments?

19 MR. LLENZA: At this moment, you
20 know, I don't know if -- Alex, do we know of
21 any other? Just come up to my microphone.

22 FACILITATOR BROOKMAN: Find a

1 microphone, Alex.

2 MR. LEKOV: Alex LEKOV, Lawrence
3 Berkeley National Laboratory. At this time,
4 the Department is open for any suggestion of
5 fan types that could be included in the
6 category of safety fans.

7 FACILITATOR BROOKMAN: Okay.
8 Andrew deLaski?

9 MR. deLASKI: If you could go back
10 a slide, Charlie? There was -- where your
11 comment boxes were.

12 MR. LLENZA: Oh, okay.

13 MR. deLASKI: So I'm having trouble
14 tracking here, because in the document, Item
15 2.7 is something different. So I'm just -- in
16 terms of tracking in the framework, Item 2.7
17 is a different questions. So is there -- is
18 that --

19 MR. LLENZA: It could be a mistake,
20 so we'll just have to make corrections to
21 this.

22 MR. deLASKI: Okay. Just have to

1 go along and --

2 MR. LLENZA: I'll have --

3 MR. deLASKI: -- backtracking the
4 item numbers here. It would be good to --
5 hopefully, this is an exception, an anomaly.

6 But I also want to ask, you are
7 requesting comment on fan coverage as fans are
8 defined in the framework document. So my
9 question is, at what point does the Department
10 anticipate defining coverage? So let me be --
11 let me give a specific example.

12 So, Steve, we talk about safety
13 fans. There seems to be pretty much, you
14 know, an open question here about whether
15 safety fans would be covered at all, right?
16 So you have a standard for safety fans because
17 -- for the reason Steve just described.

18 So at what point would the
19 Department, you know, address issues of
20 whether particular types or classes or
21 definitions of fans are indeed a covered fan?

22 MR. LLENZA: I think that, you

1 know, we would have -- according to the
2 schedule, it's probably at the preliminary
3 analysis stage.

4 Now, if there is a possibility of
5 us issuing --

6 MS. KOHL: This is Betsy Kohl, DOE
7 General Counsel. I mean, obviously, we don't
8 make final decisions until the final rule.
9 Right? So we take input and we potentially
10 narrow issues as we move along.

11 MR. deLASKI: Right.

12 MS. KOHL: And in the proposal, you
13 know, you'll get the best idea of the
14 Department's proposal for what we think the
15 scope should be. And then, again, we take
16 comments and consider it and then there is
17 your final rule. So --

18 MR. deLASKI: Okay.

19 MS. KOHL: -- definitive decisions
20 are not made until the end.

21 MR. deLASKI: Right. Because it
22 just strikes me that the issues of what is in

1 and what is out will be very much live issues

2 --

3 MR. LLENZA: All the way through.

4 MR. deLASKI: -- through this
5 process.

6 MR. LLENZA: Right.

7 MR. deLASKI: And telling you today
8 what should be in and what should be out
9 strikes me as being an impossibility.

10 MR. LLENZA: But we have to start
11 somewhere.

12 MR. deLASKI: Right. But I think
13 it -- exactly, but --

14 MR. LLENZA: So --

15 MR. deLASKI: Thank you.

16 FACILITATOR BROOKMAN: Louis.

17 MR. STARR: Louis Starr, Northwest
18 Energy Efficiency Alliance. I think I would
19 encourage Department of Energy to investigate
20 a definition of safety fans. A lot of times a
21 safety fan can just be a regular fan that is
22 pressurizing a stairwell and it doesn't really

1 have -- the same fan could be used in another
2 application.

3 Also, fans in an actual building
4 system can use -- the air handling system can
5 be used to pressurize fans above and below a
6 floor in order to do a smoke pressurization
7 system. So unlike pumps where it might have a
8 little more clearer defined definition, I
9 would look into whether just a safety fan
10 could just be a regular backward inclined fan
11 that is sold for a lot of applications, has a
12 high static pressure, and can maintain that.
13 So I would encourage them to take a look at
14 that.

15 FACILITATOR BROOKMAN: Michael,
16 you're next.

17 MR. IVANOVICH: AMCA is prepared to
18 talk about classes in more detail and make
19 some recommendations for exemptions on safety
20 fans. So we are going to --

21 FACILITATOR BROOKMAN: Okay. And
22 also, we wish to, as reflected in the comment

1 box, get your details, your best thinking on
2 these definitions.

3 Steve Rosenstock.

4 MR. ROSENSTOCK: Steve Rosenstock,
5 EEI. Again, in terms of -- you know, again,
6 it is always making the definition, but then
7 saying just have -- if possible, you know,
8 just have the separate categories for the
9 types of fans specifically you're talking
10 about, such as smoke exhaust fan, you know, or
11 stairwell pressurization fan, where, you know,
12 maybe it's -- not only it's a safety fan but
13 also there's a functionality where you know
14 specifically it's not a general air handler.

15 It can also pressurize a floor.
16 It's a specific safety -- or I would also say
17 health -- it could be carbon -- you know, a
18 carbon monoxide detector in a garage where
19 that -- there is a specific fan just for that,
20 you know, example. So --

21 FACILITATOR BROOKMAN: Okay. Dave.

22 MR. WINNINGHAM: Dave Winningham,

1 Allied air. We're a division of Lennox, and
2 we manufacture a variety of residential and
3 commercial products that employ, you know,
4 fans and blowers that can be used in these.

5 One of our key concerns is the
6 potential passout line could take this
7 regulation to the component level. You know,
8 a fan manufacturer can manufacture a fan that
9 can be used in a variety of products,
10 residential, commercial, covered, non-covered,
11 and it could be the same component.

12 I would caution DOE in, you know,
13 due care needs to be taken that we understand
14 those intricacies, and the definitions around
15 this is critical. But also, once it's
16 defined, if it's something that's used in
17 multiple applications, where does it fall?

18 FACILITATOR BROOKMAN: We have a --
19 someone online, Jay Perkins has raised his
20 hand or -- and so, Jay, go ahead. And speak
21 loudly, and let's see if you come in -- if we
22 can hear you here in the room.

1 MR. DOPPEL: Yes. This is actually
2 Paul Doppel. Jay and I are on the same line.

3 FACILITATOR BROOKMAN: Okay.

4 MR. DOPPEL: And --

5 FACILITATOR BROOKMAN: Go ahead,
6 Paul.

7 MR. DOPPEL: With Mitsubishi
8 Electric. And the comment that we have is
9 that with the definition of industrial fans
10 and blowers, commercial and industrial fans
11 and blowers, I think it would be appropriate
12 to specifically exclude those that are used
13 for comfort, heating, and cooling, just to
14 make sure that there isn't an overlap.

15 FACILITATOR BROOKMAN: And so you
16 need to say why.

17 MR. DOPPEL: Well, just to avoid
18 any confusion of -- because a lot of
19 manufacturers do have air handlers/blowers
20 that are used with outdoor units and split
21 system applications. And there is a -- just
22 want to make sure that those wouldn't be

1 included in this rulemaking, because there is
2 already -- we are already incorporated within
3 other systems.

4 FACILITATOR BROOKMAN: Oh, okay.
5 Okay. Thank you, Paul.

6 MR. LLENZA: And this Charles
7 Llenza, the Department of Energy. I suggested
8 you would send us a written comment with the
9 detailed reasons as to why we shouldn't be
10 mixing apples and oranges I guess.

11 FACILITATOR BROOKMAN: I'm eager to
12 get to these definitions, but, Gary, go ahead.

13 MR. FERNSTROM: Well, just a quick
14 question. I don't quite understand why the
15 components in another system that may be
16 regulated shouldn't themselves be regulated,
17 because it seems to me whether a fan is going
18 into a furnace system or not it wouldn't hurt
19 to have a fundamentally efficient fan to put
20 in there. You know, compounding regulation
21 doesn't seem to me to be so much a problem as
22 an opportunity.

1 FACILITATOR BROOKMAN: Is it
2 Aniruddh?

3 MR. ROY: You've got it correct.
4 Aniruddh Roy, AHRI.

5 FACILITATOR BROOKMAN: Yes.

6 MR. ROY: To answer that question,
7 as far as covered products are concerned,
8 there are already efficiency metrics out there
9 that capture the overall efficiency of a
10 system. And the fan, as a component of a
11 system, you know, as far as applied products
12 are concerned, the fan, as a standalone
13 components, its performance may be
14 significantly different from how its
15 performance is within the system.

16 And so at least for covered
17 products, as far as they are concerned, what
18 we are seeing is that, you know, there are
19 already regulations out there by DOE that are
20 regulating these efficiencies, and these
21 energy conservation standards adequately
22 account for that energy consumption of the fan

1 within the system.

2 FACILITATOR BROOKMAN: Okay. Don
3 Brundage.

4 MR. BRUNDAGE: I would agree with
5 AHRI that you should not be regulating a
6 subproduct of a covered product. And I am
7 reminded of some ways this was handled in some
8 of the lighting products where there were
9 requirements on how things were packaged and
10 sold to differentiate retrofit products from
11 other products. And I think some similar sort
12 of solutions could be done here for things
13 that are supplied as a component to other
14 products.

15 FACILITATOR BROOKMAN: Andrew, a
16 follow on.

17 MR. deLASKI: So I'm trying to find
18 a reference in the framework, but I think DOE
19 has already said not covering fans that are
20 part of covered products. Am I right?
21 They're out of the scope of the rule.

22 FACILITATOR BROOKMAN: I saw

1 Aniruddh and Dave. Go ahead.

2 MR. deLASKI: If I could finish --

3 FACILITATOR BROOKMAN: Oh. I'm
4 sorry, Andrew.

5 MR. deLASKI: So I think Gary's
6 question, I would hope people could still
7 respond to that, because to me in the
8 Department currently we have standards to
9 cover components for lots of things --
10 ballasts, light bulbs, furnace fans have a
11 separate regulation.

12 So there are -- it's not an unusual
13 thing to have a standard that applies to a
14 component. So I think the question here --
15 and the challenge for the Department, as I see
16 it, is that the Department regulates
17 manufacturers. They don't regulate people who
18 design systems onsite. It's not a Building
19 Code we're talking about. We had that
20 conversation earlier.

21 So the opportunity in this kind of
22 docket is to address the fan as defined

1 through this process. And that may be defined
2 more broadly or more narrowly; that's part of
3 what we are going to be discussing later I
4 think. But I'm going to respond to Gary's
5 question about how does that -- how does
6 regulating the fan as an individual product
7 impede getting to better efficiency in some
8 overall system in the field.

9 FACILITATOR BROOKMAN: Let's let --
10 Gary, you follow on, and then I'm going to go
11 to Aniruddh, and then I'm going to go to
12 Karim.

13 MR. FERNSTROM: Okay. So I have a
14 quick comment. Let's carry this to the
15 extreme. We regulate buildings and new
16 construction. So why regulate any component
17 that goes into buildings? Why do we even have
18 an appliance standards program?

19 PARTICIPANT: Good question.

20 (Laughter.)

21 MR. FERNSTROM: I mean, if you
22 carry that --

1 FACILITATOR BROOKMAN: But, of
2 course, we could have a lengthy discussion
3 about codes, which would not be germane here.

4 Aniruddh.

5 MR. ROY: Aniruddh Roy, AHRI. My
6 answer was just in response to Gary's initial
7 question. And, again, AHRI is of the opinion
8 that if you -- you know, if there are separate
9 regulations for each component, what you are
10 eventually doing, especially for covered
11 equipment, you are eventually stifling
12 innovation for the manufacturer, because now
13 you are telling the manufacturer that you can
14 only use this kind of a component in the
15 system.

16 And there are already existing
17 energy conservation standards out there. So
18 as long as the manufacturer meets those
19 standards, it shouldn't matter what the
20 manufacturer puts into the system.

21 FACILITATOR BROOKMAN: Okay.
22 Karim.

1 MR. AMRANE: Yes. Karim Amrane
2 with AHRI. I would go a little bit further
3 than that. Yes, I think it is clearly stated
4 in the framework document that the regulation
5 we are talking today does not apply to fans
6 used in covered equipment. And that's fine.

7 But let's say we take the example
8 of rooftop units. Okay? They are regulated
9 by DOE, but they are regulated, let's say, up
10 to 63 ton. Now you are talking about, let's
11 say, 64-ton unit, which is not regulated by
12 DOE because that's where the regulation stops.

13 Now, that equipment now its stand
14 would be regulated by this -- the code that we
15 are talking today. And that does not make
16 sense at all.

17 So for us as AHRI, we would like to
18 exclude those products from this rulemaking
19 totally, because those are system design, they
20 are manufactured, and there are actually
21 standards in place, although they are not
22 maybe standards that DOE regulates today, but

1 they are standards in ASHRAE 90.1. ASHRAE
2 90.1 covers products below 63 tons, for
3 example.

4 FACILITATOR BROOKMAN: Steve
5 Rosenstock.

6 MR. ROSENSTOCK: Steve Rosenstock,
7 EEI. And, you know, I appreciate the
8 information. And just as a follow on, think
9 about it, if fans used for comfort heating and
10 cooling were not excluded, then DOE would be
11 making a standard for furnace fans. And I
12 think a furnace fan is a blower fan. So under
13 this rulemaking you would be making another
14 standard for that blower fan; that could be a
15 furnace fan.

16 So if you say they should not be
17 exempt, then guess what? You're dealing with
18 two regulations for the same product.

19 MR. ROGERS: Furnace fans are
20 residential as defined now, right?

21 MR. ROSENSTOCK: I know. But,
22 again, I understand --

1 MR. ROGERS: Not part of this, but

2 --

3 MR. ROSENSTOCK: -- but for multi-
4 family there could be issues in terms of
5 multi-family. And for the larger ones, it
6 could be quote "commercial sized."

7 FACILITATOR BROOKMAN: Okay. Dave.

8 MR. WINNINGHAM: And I recognize
9 the intent here is to raise the energy
10 efficiency of the products and it is something
11 that we are all interested in. But just to
12 the discussion we are having, a furnace, the
13 component, the blower inside of that could
14 have a commercial or industrial application.

15 So you could have the regulation on
16 the component itself, a furnace fan
17 regulation, and then also the regulation of
18 the final furnace product. All of these
19 things enter into and add cost at some point.

20 And we have to focus, what makes
21 the most, you know, sense for the end product?
22 A furnace -- and I'm just picking that as an

1 example -- you can -- there are a variety of
2 choices to increase the efficiency of a
3 furnace. Some of them may involve very high
4 internal static to improve the efficiency of
5 the primary fuel source -- gas, for instance,
6 or electricity.

7 So there are compromises that are
8 made in the design of the end product to get
9 to the efficiency level that you are trying to
10 seek. When you take the regulation to a
11 component level, you could have unintended
12 consequences by requiring efficiency levels of
13 that component. They are applied very poorly,
14 and the ultimate result is lower efficiency,
15 not improved efficiency.

16 FACILITATOR BROOKMAN: Right. So I
17 think we're understanding, and I think we've
18 now developed the logic here sufficiently.
19 Okay? And so I'm eager to move on, Gary.

20 MR. FERNSTROM: I just wanted to
21 say thank you. I understand that argument.

22 (Laughter.)

1 FACILITATOR BROOKMAN: Yes. Let's
2 start on definitions. These guys have
3 developed some great -- and noting, just one
4 caution here, in my experience definitions are
5 always tough and take some time and scrutiny.
6 So we are not going to get that level of it
7 here today.

8 So what you have developed will be
9 in your written comments, of course. Let's
10 just get a flavor for it right now, and let's
11 start at the top and work our way down in
12 Slide 21. Charles, so please -- Tim.

13 MR. KUSKI: Tim Kuski representing
14 AMCA. And the very first question here, 2-1,
15 is a little bit truncated. If you read the
16 entire question in the framework, it talks
17 about our fans sold with motors or without
18 VFDs.

19 FACILITATOR BROOKMAN: Okay.

20 MR. KUSKI: And I'd like to address
21 that. The fan manufacturers sell the majority
22 of our fans with motors, and most of them are

1 belt-driven. However, many of our OEM
2 customers that buy our fans and integrate them
3 into our products, they buy our fans less
4 motors.

5 Packaging fans with VFDs is not
6 common for the fan manufacturers. We don't
7 have a number yet, but we estimate it less
8 than five percent of the time, much less, are
9 we selling a VFD with a fan.

10 And to follow up on what you and
11 Michael were talking about, AMCA can supply
12 DOE with more data regarding these kind of
13 shipments, something we would have to do in a
14 separate survey to our customers, and DRI is
15 talking about timeframes.

16 So even by the May 2nd written
17 comment period, we could get back on that.

18 FACILITATOR BROOKMAN: Okay.
19 Great. Are you also in a position -- anybody
20 at AMCA -- to address Items 2.2-2, 2-3, 2-4,
21 especially definitions, cross-flow, blower,
22 and safety fans.

1 MR. HARTLEIN: So Dan Hartlein from
2 Twin City Fan speaking on behalf of AMCA. We
3 believe that cross-flow fans should be exempt.
4 We are going to get into the details and the
5 rationale for that position as we go along
6 today.

7 On the --

8 FACILITATOR BROOKMAN: And as a
9 consequence, you don't want to define it?

10 MR. HARTLEIN: At this point, we
11 don't. But we --

12 FACILITATOR BROOKMAN: Okay.

13 MR. HARTLEIN: -- I mean, we can
14 define the physical characteristics,
15 obviously, of what a cross-flow fan is. But
16 we believe they should be exempt, and, as I
17 said, we'll get into that.

18 FACILITATOR BROOKMAN: Okay. Keep
19 going.

20 MR. HARTLEIN: On 2.3, the
21 recommended suggestion/definition for blowers,
22 they are trying to draw a line between blowers

1 and fans. AMCA does not really recognize a
2 difference. We use the two terms
3 interchangeably, and we would suggest that the
4 DOE do the same. Okay?

5 FACILITATOR BROOKMAN: Okay.

6 MR. HARTLEIN: On the 2.4, a
7 comment on the suggested definitions for
8 safety fans. One addition to that definition
9 is reversible fans. There is a class of fans
10 for tunnel ventilation, which operate in a
11 reversible manner which has a compromise to
12 efficiency that are there for safety.

13 And we also would like to insert
14 that there are fans that are dual purpose that
15 are designed predominantly for their safety
16 role. So we need to keep that in mind as
17 well.

18 FACILITATOR BROOKMAN: Does AMCA --
19 maybe AMCA -- this would be a new question for
20 you. And, of course, practically speaking, if
21 there are a hundred definitions, that's very
22 cumbersome. Right? So the more definitions

1 the more difficult it is to do everything.

2 But what about Steve Rosenstock's
3 suggestion that safety fans be more
4 differentiated? Is that something that you
5 all could generally support?

6 MR. HARTLEIN: Yes. I think as we
7 come together, we can support some discussions
8 in that arena.

9 FACILITATOR BROOKMAN: Okay.

10 MR. CYMBALSKY: This is John
11 Cymbalsky, DOE. Is there a certification
12 process that you go through that is different
13 for safety fans, for these tunnel fans, for
14 example? Do they get certified to a different
15 --

16 MR. HARTLEIN: They do. They
17 actually get tested on almost a per-contract
18 basis. So they are developed and tested per
19 contract, because of the life safety
20 requirements. And quite often they are
21 actually tested at full temperature in order
22 to demonstrate that they perform at those

1 temperatures.

2 FACILITATOR BROOKMAN: Okay. So
3 there is potentially some line out there in
4 the industry that we can look at to --

5 MR. HARTLEIN: Yes.

6 FACILITATOR BROOKMAN: Okay.

7 MR. HARTLEIN: Those are -- it's
8 NFPA 30.

9 FACILITATOR BROOKMAN: Got it. Is
10 that an efficiency-type measure?

11 MR. HARTLEIN: There is an
12 efficiency -- no, it's not. It's actually the
13 performance of temperature and the
14 requirements for the reversibility.

15 MR. LLENZA: Safety.

16 MR. HARTLEIN: It's a safety -- but
17 it's not possible to design that fan at a high
18 -- at the highest efficiency, because of the
19 implications that come from the design for
20 temperature.

21 FACILITATOR BROOKMAN: Okay. So
22 I'm kind of a nut about structure. You'll

1 have to pardon me. So I want you to look at
2 page 21 in your PowerPoint slides, everyone,
3 if you would, please. And we'd like to
4 receive comment on your -- on these
5 definitions, whether you like them, how you
6 might revise them, et cetera. And noting what
7 has also already been said, I appreciate that.
8 I do, Mark. Or Dan. Pardon me, Dan.

9 MR. CYMBALSKY: John Cymbalsky,
10 DOE. And so for the fans that you would want
11 exempt, it would be good to provide a written
12 comment as to how the Department could
13 distinguish those that would be safety-
14 related. So they go to this different safety
15 rating, whereas other fans that aren't safety-
16 related don't certify to that specification.
17 So that would help us, you know, delineate one
18 from the other.

19 FACILITATOR BROOKMAN: Okay. So do
20 we have comments on commercial and industrial
21 fan manufacturer, axial fan, centrifugal
22 cross-flow and mixed flow, et cetera.

1 Or maybe -- Michael, go ahead.

2 MR. IVANOVICH: AMCA has been
3 working on a fan definition, a different
4 definition of fan. And we are pretty far
5 along, and we are going to provide a more
6 detailed definition of a fan in our written
7 comments. But it's too long. You know, it's
8 got a lot of parts to it, because we are
9 understanding that it has to be statutorily
10 enforceable. And so we are very, very precise
11 with this definition --

12 FACILITATOR BROOKMAN: Gotcha.

13 MR. IVANOVICH: -- and we're going
14 to provide it in written comment.

15 FACILITATOR BROOKMAN: Okay.
16 Excellent. Excellent. Additional and perhaps
17 final comments on this segment, authority
18 definitions and regulatory options? Because
19 we're about to go to break.

20 Andrew?

21 MR. deLASKI: I just want to come
22 back to the issue we were talking about a few

1 moments ago. So on -- you know, it's on page
2 2, that DOE says it's not considering fans
3 that are components in regulated commercial
4 products in this rulemaking, and I'm wondering
5 why. Is there a legal reason why, or is it
6 simply a determination that -- for the reasons
7 that we have already heard, is there a
8 tactical reason why?

9 FACILITATOR BROOKMAN: Betsy.

10 MS. KOHL: So I can address at some
11 level the legal issue that we have been
12 discussing. And, obviously, it is open for
13 comment. We want to make sure that there
14 aren't duplicative standards. As you know,
15 there are requirements for updating standards
16 for certain products, right, and timelines,
17 that sort of thing.

18 And then there is also -- and this
19 is components of consumer products, but it's
20 in the definition of industrial equipment. So
21 we want to make sure that we stay clear of
22 that one, too. It's 6311(2)(A)(iii). So if

1 you want to go take a look at that.

2 So there are some legal issues that
3 we have been discussing. But if you have
4 input or comments that you would like to make,
5 they are of course welcome at this early
6 stage.

7 MR. deLASKI: Okay. Thank you.

8 FACILITATOR BROOKMAN: Okay. Who
9 else -- so, yes, please. Is it Mark?

10 MR. BUBLITZ: Mark Bublitz, New
11 York Blower Company on behalf of AMCA. I
12 would like to just recognize in Item 2.7 that
13 the definitions are tightly coupled with fan
14 classifications, and AMCA would request that
15 DOE consider a more granular approach, which
16 we are prepared to share when we get to
17 Section 5.

18 FACILITATOR BROOKMAN: Okay. Okay,
19 good. And Charles Kim joining us online,
20 Charles, you are next. Please speak clearly
21 and loudly.

22 MR. KIM: Okay. There are

1 industrial blowers within the ratio of greater
2 than 1.2. So, therefore, I am wondering if it
3 would be a gap between the definition of
4 blower away from the compressors.

5 So right now my understanding is
6 that U.S. DOE doesn't have any rulemaking or
7 framework for our compressors. And it depends
8 on how you define the specific ratio. Some
9 blowers might not be defined by the fan or the
10 compressor later on.

11 FACILITATOR BROOKMAN: John
12 Cymbalsky.

13 MR. CYMBALSKY: Yes. So DOE does
14 have a coverage determination out in the
15 public view on compressors. So that will be
16 handled under a separate rulemaking.

17 FACILITATOR BROOKMAN: Charles?
18 Okay?

19 MR. KIM: So anything greater than
20 1.2, specific ratio greater than 1.2, will be
21 covered by compressor.

22 MR. CYMBALSKY: I don't have the

1 numbers on the top of my head, but we'll get
2 back to you on that one.

3 MR. KIM: My concern was -- yes.
4 My concern was DOE should not have any gap.
5 Some of the blowers is operating in specific
6 ratio greater than 1.2. So if there is a
7 blower that is not covered by a fan or the
8 compressor later on, then it will be a lost
9 child.

10 MR. CYMBALSKY: John Cymbalsky,
11 DOE. Yes. We normally try to avoid creating
12 loopholes and that kind of thing.

13 FACILITATOR BROOKMAN: Charles, and
14 everyone participating, I think we have said
15 this already today, but the Department really
16 appreciates your detailed comments in writing.
17 And then these issues, they all get addressed,
18 so please do that.

19 Charles, what is your affiliation?

20 MR. KIM: Charles Kim from Southern
21 Cal Edison Company. I have a plan to file
22 written comments with the other utilities

1 within California.

2 FACILITATOR BROOKMAN: Charles,
3 would you say it again? Because at the front
4 of that you were breaking up.

5 MR. KIM: Charles Kim from Southern
6 California Edison Company.

7 FACILITATOR BROOKMAN: Thank you.
8 Thank you. Okay, Charles. Thank you.

9 MR. KIM:

10 FACILITATOR BROOKMAN: Okay. Let's
11 take a break. It's almost 10:30. We will
12 take a break until 10:45. You must wear this
13 badge visible while you're in the building.

14 And there is a coffee shop on the
15 ground floor. The restrooms are at both ends
16 of this hall, both men's and women's restrooms
17 at both ends of the hall.

18 And we have a good start on it, and
19 we need to try and keep being specific as we
20 go along.

21 (Whereupon, the proceedings in the foregoing
22 matter went off the record at 10:27

1 a.m. and went back on the record at
2 10:50 a.m.)

3 FACILITATOR BROOKMAN: Okay. And
4 at the break, Michael approached me and said
5 he would like -- they would like to return to
6 definitions briefly, so let's do that before
7 we turn to Sanaee.

8 Michael, please. Or --

9 MR. STEVENS: Hi. This is Mark
10 Stevens. I'm with AMCA.

11 FACILITATOR BROOKMAN: Yes.

12 MR. STEVENS: And under
13 Definitions, we just wanted to point out that
14 our trade association has a little bit more
15 restrictive definition of fan, and that we
16 consider a fan a device that converts
17 mechanical power to air power.

18 FACILITATOR BROOKMAN: Okay. Well,
19 definitions are important, and you all should
20 --

21 MR. STEVENS: We will be
22 submitting --

1 FACILITATOR BROOKMAN: -- meet the
2 deadline for submittals, but --

3 MR. STEVENS: Right.

4 FACILITATOR BROOKMAN: -- give it
5 your due diligence.

6 MR. STEVENS: We definitely will.

7 FACILITATOR BROOKMAN: Yes. Okay.
8 Thank you.

9 So now we are turning to Sanaee,
10 regulatory regimes. And we are on Slide 27.

11 MS. IYAMA: Okay. So I'm Sanaee
12 Iyama with the Lawrence Berkeley National Lab,
13 and I will start with the regulatory regimes.

14 So as Charlie mentioned before,
15 there is no statutory definition for
16 commercial or industrial fans. And DOE may
17 consider a definition that includes the motor
18 drive and/or a VSD. This approach, for
19 example, is used in Europe in their non-
20 residential fan regulation or their regulating
21 fan inclusive of motors and controls.

22 MR. ROSENSTOCK: Question.

1 FACILITATOR BROOKMAN: Steve,
2 please.

3 MR. ROSENSTOCK: Hi. Steve
4 Rosenstock, EEI. On Slide 21 there was
5 another proposed definition. So my question
6 is, which definition is going to -- are you
7 looking at?

8 MS. IYAMA: Right. So here -- this
9 definition is for fans defined as bare shaft
10 fans. And in this next section we are
11 discussing a potential definition that would
12 include motor drive and controls.

13 FACILITATOR BROOKMAN: You're
14 referring to the definition on page 27. Say
15 it again, what that is?

16 MS. IYAMA: So it's a definition of
17 commercial and industrial fans.

18 FACILITATOR BROOKMAN: On 27.

19 MS. IYAMA: On Slide 27 that would
20 include motor drive and/or the VSD. Again,
21 there is no statutory definition for
22 commercial and industrial fans, and this is a

1 discussion of a possible definition that would
2 be inclusive of those components.

3 FACILITATOR BROOKMAN: Okay.
4 Steve.

5 MR. ROSENSTOCK: Steve Rosenstock,
6 EEI. Thank you again. It's a more expansive
7 definition, and my concern -- and I expressed
8 it yesterday, I'll express it again -- I am a
9 little worried that it is just -- you know,
10 there might be other technologies that might
11 be manufactured with a fan other than variable
12 speed drives.

13 And there is other technologies
14 that can help improve the efficiency of a fan
15 other than variable speed drive. So I would
16 be very worried about for this definition just
17 saying VSD. In my mind, it should be a more
18 expansive or inclusive type of wording, such
19 as energy -- fan energy control system or
20 device or energy management device rather than
21 just a VSD.

22 Again, I know it is getting in the

1 weeds, but I think it could be -- it can be
2 pretty important because of the fact that I
3 don't think that technologies or options
4 should be limited, and this is kind of a -- it
5 kind of limits it. It's a great technology,
6 but it does limit it.

7 FACILITATOR BROOKMAN: You're going
8 to send these in in your comments, right,
9 Steve?

10 Charles Llenza.

11 MR. LLENZA: Yes. I'd just
12 encourage everybody to send your comments in
13 with that respect. And, again, this is the
14 framework document, so this is a proposal, and
15 we make adjustments according to our comments.

16 FACILITATOR BROOKMAN: And
17 definitions are always tough. There's just no
18 doubt about it.

19 Rob, go ahead.

20 MR. BOTELEER: Yes. I would just
21 comment, you know, in the motor world, we like
22 the term variable speed or adjustable speed.

1 We don't like the term variable frequency
2 drive, because then that limits us to
3 induction motors. But when we say variable
4 speed, we really include electric, electronic,
5 or as well as mechanical adjustable speed.

6 FACILITATOR BROOKMAN: Okay. Thank
7 you.

8 Sanaee, keep going.

9 MS. IYAMA: Thank you. So those
10 variable speed devices are controls that allow
11 matching the rotational speed of the fan to
12 match process requirement. And they benefit
13 variable load applications. They may not
14 appropriate for all types of application, and
15 DOE is aware that some fans could be used in
16 both constant and variable load applications.

17 DOE is also aware that
18 manufacturers cannot control if and how a VSD
19 is used. And in their -- in our analysis we
20 plan to conduct the analysis across the full
21 spectrum of fan applications and characterize
22 baseline conditions to establish the impacts

1 of using VSDs on the field energy use.

2 Depending on the fan definition,
3 DOE is considering three regulatory regimes.
4 If a fan is defined as a bare shaft fan, DOE
5 is considering a bare shaft fan regulatory
6 approach for all fan types, regardless of how
7 they are sold. And that is regulatory regime
8 number one.

9 If fans are defined as inclusive of
10 VSD if sold together, then we would have two
11 sets of equipment classes -- fans without VSDs
12 and fans with VSDs. And that's regulatory
13 regime number two.

14 If fans are defined as inclusive of
15 a motor if sold together, then we would have,
16 again, two sets of equipment classes, this
17 time fans sold without motor, fans with
18 motors. And that would be regulatory regime
19 number three.

20 And in the next section related to
21 metrics, we will see how this impacts the
22 process.

1 Here we have a comment box related
2 to the regulatory regimes. Item 2-9, do you
3 request comments on whether establishing
4 standards for fan defined inclusive of the
5 motor, transmission, and controls could
6 increase the benefits of using VSDs in the
7 field?

8 2-10, DOE requests data and comment
9 on whether fans are most often combined with
10 motors, VSDs, or both, by the fan manufacturer
11 or by fan distributors/contractors.

12 2-11, DOE requests information on
13 how often and in what circumstances the
14 intended application is known when the fan is
15 sold.

16 And 2-12, DOE seeks comments on
17 whether to consider establishing standards
18 only for fans with fan diameters below a
19 certain maximum or above a certain minimum.
20 So that comment actually relates to the
21 sections we covered before --

22 FACILITATOR BROOKMAN: Okay.

1 MS. IYAMA: -- on the definitions.

2 FACILITATOR BROOKMAN: Let's start
3 with the first one, 2-9. Mark.

4 MR. STEVENS: Yes. We have, you
5 know, some comments we could make immediately
6 on some of these definitions.

7 FACILITATOR BROOKMAN: Please.

8 MR. STEVENS: The first one is on
9 VSDs. The first definition on page 8 refers
10 to a VSD as a device that can control the
11 speed of a motor or a fan, and then on page 15
12 it is more restrictive, saying that a control
13 using -- controlling the speed of a fan or a
14 motor using voltage control. And we prefer
15 the less restrictive definition, the one found
16 on page 8.

17 FACILITATOR BROOKMAN: Okay.

18 MR. STEVENS: All right. The
19 second one has to do with the definition of a
20 bare shaft fan. Bare shaft fan, that
21 definition is a European construct, something
22 that is really not used here. We use the term

1 driven or non-driven fans.

2 FACILITATOR BROOKMAN: Michael.

3 MR. IVANOVICH: This is Michael
4 Ivanovich, AMCA International. It is kind of
5 a question, really, you know, when we started
6 this rulemaking process we had heard this idea
7 floating about, the extended product approach
8 from Europe being applied in the United
9 States.

10 And there was a question early on
11 whether or not DOE had the authority to
12 develop a regulation for extended products.
13 And AMCA would like to hear some explanation
14 as to how that was resolved.

15 MS. KOHL: This is Betsy Kohl, DOE
16 OGC. We are still considering that issue. So
17 if you have, again, input and analysis, we'd
18 appreciate it.

19 FACILITATOR BROOKMAN: So, Louis --
20 oh, go ahead. Follow on, Michael. Keep
21 going.

22 MR. IVANOVICH: So just to clarify,

1 even though the extended product approach is
2 being proposed by DOE in the frameworks for
3 pumps and fans, it is not completely
4 determined whether or not you could regulate
5 on extended --

6 MS. KOHL: This is --

7 FACILITATOR BROOKMAN: Betsy,
8 please get close.

9 MS. KOHL: Sorry. Betsy Kohl, DOE
10 GC. So this is not a proposal, right? That's
11 the proposed rule. I know we kind of
12 interchanged those terms. But this is an
13 early stage framework document where we are
14 still fleshing out all of those issues and
15 seeking comment and input on them.

16 FACILITATOR BROOKMAN: Go ahead.

17 MR. IVANOVICH: I'm just -- since
18 we're new to the process, it could be implied
19 -- it seems inferred to us that they would
20 have the authority to regulate that. That's
21 all.

22 FACILITATOR BROOKMAN: Okay.

1 Louis.

2 MR. STARR: Louis Starr with
3 Northwest Energy Efficiency Alliance. So Item
4 2-9, it represents a substantial opportunity
5 to save a lot of energy.

6 And so one of the questions I had
7 maybe a little bit for AMCA was, actually, I
8 was looking at your In Motion magazine and it
9 just mentioned that January 1st of 2013 they
10 put in the FMEG requirements, which
11 essentially addresses that extended product
12 type of view of it.

13 How has that affected -- I mean, it
14 says it's eliminating 13 percent of your
15 market of certain kind of fan. How -- I'm
16 assuming that AMCA sells both in the American
17 and European market. Have you seen that? How
18 has that worked out for you? And has it been
19 a positive or a negative experience?

20 (Laughter.)

21 FACILITATOR BROOKMAN: No comment
22 at this time.

1 MR. IVANOVICH: Our official
2 response really is that it is kind of too
3 early to tell. I mean, it's just starting, so
4 it's really too early to tell.

5 FACILITATOR BROOKMAN: Thank you,
6 Michael.

7 Dan.

8 MR. HARTLEIN: Yes. I wanted to
9 just add an explanation about how -- something
10 our industry does in the variable speed, which
11 is very different than what you see in the
12 pump world. Our industry is dominated by
13 shipments with belt drives. A belt drive is
14 mechanical speed adjustment, as Rob presented
15 it earlier.

16 What happens often is that once a
17 commercial fan is in the field applied to a
18 system, many of these drives are actually
19 meant to be variable diameter or variable
20 speed. So when the air balancer comes through
21 and balances the product, he ends up setting
22 an exact speed for the exact load and

1 maximizes efficiency through that process.

2 So the concept that those results
3 aren't being achieved through -- because we
4 are not using variable frequency drives,
5 really, I think we have. I think the industry
6 has found a very, very cost effective approach
7 to set that exact operating speed and maximize
8 that efficiency for that installation.

9 FACILITATOR BROOKMAN: Okay.

10 MR. IVANOVICH: How does the --

11 FACILITATOR BROOKMAN: Oh, just a
12 second. So I thought variable speed drives,
13 though, were a component that was a defined
14 entity, and that's different from having
15 someone who is capable of servicing a motor
16 and a belt drive and creating the optimal,
17 right?

18 MR. HARTLEIN: Well, again, Dan
19 Hartlein speaking for AMCA. That goes I guess
20 to the definition of VSD --

21 FACILITATOR BROOKMAN: Okay.

22 MR. HARTLEIN: -- as opposed to --

1 FACILITATOR BROOKMAN: I'll just
2 leave it there. Go ahead, Louis.

3 MR. STARR: Maybe I could clarify I
4 think what he's getting at. What he is
5 referring to is whether -- kind of matching
6 your fan and your load to the -- or the fan
7 motor operation to the load.

8 So it -- what I think -- the
9 captured savings in this one is more the
10 adjustable load profile. That is the savings
11 you are trying to get, although there still
12 could be some savings attained by being able
13 to adjust that constant volume fan in the
14 field in terms if your design changes down the
15 road or if there are some other aspects of it.
16 And assuming that a lot of the shift changes
17 that you're talking about happen, so --

18 FACILITATOR BROOKMAN: Okay. Yes,
19 go ahead, please. Say your name.

20 MR. WAGNER: Greg Wagner, Morrison
21 Products. I want to go back to that
22 definition of bare shaft fan and --

1 FACILITATOR BROOKMAN: Where is it,
2 Greg?

3 MR. WAGNER: Let's see. It's
4 slide 21.

5 FACILITATOR BROOKMAN: Okay.

6 MR. WAGNER: And while there is a
7 great deal of product that is sold as belt
8 drive fans and they do come with shafts and
9 those things, there is a great deal of product
10 that is sold as for -- intended for direct
11 drive use, both with and without VSDs.

12 How do you plan on differentiating
13 between products that are sold as -- there is
14 no shaft, it's a bare fan, versus ones that
15 are sold as bare shaft? Because it is a
16 little different in that application. Some
17 are sold into -- where they are intended to be
18 used with the housing, but they don't -- they
19 are not sold with the housing, because it is
20 part of the appliance or product that is going
21 to be manufactured. So there is a whole other
22 level of this.

1 And the final thing is the question
2 of, what is a commercial and industrial and
3 how are you going to differentiate that?
4 Because a lot of products are sold into both
5 residential, consumer-type products, as well
6 as --

7 FACILITATOR BROOKMAN: And this is
8 a framework meeting where we are just fleshing
9 this issues out. So if you have a
10 recommendation about how these issues get
11 addressed, because I don't think the
12 Department is going to take a stand on this
13 yet. Right?

14 MR. WAGNER: Well, they are putting
15 forth the framework for regulating something,
16 and the question is, what is that something?

17 FACILITATOR BROOKMAN: Betsy?

18 MR. WAGNER: There's a wide range
19 of products that could be covered under the
20 scope of this, which is as broad as I can say.

21 MS. KOHL: So this is Betsy Kohl
22 from DOE GC. Just to give you a little bit of

1 your framework, the definition of industrial
2 equipment talks about distribution for
3 commercial uses. So that is sort of -- I
4 mean, it's the fan that we're looking at, but,
5 I mean, there are a couple of I guess --

6 MR. WAGNER: Nuances.

7 MS. KOHL: Yes. That we are
8 looking at. So in order to frame your
9 comments, it might be useful to look at that.

10 FACILITATOR BROOKMAN: Okay.

11 MR. WAGNER: Well, I guess that
12 needs to be identified, what that is, because
13 fans are sold into applications that are
14 similar that go into both
15 industrial/commercial, if you will, as well as
16 consumer-type products. And it's the same
17 product.

18 MS. KOHL: Right.

19 MR. WAGNER: So how are we
20 differentiating between those? And then the
21 other one is, what is a bare shaft?

22 MS. KOHL: Right. Well, on your

1 former issue, I think what Doug is saying and
2 what we have been trying to say is that this
3 is an early stage document. So your input on
4 where things are sold and what you think
5 should be covered would be very useful.

6 FACILITATOR BROOKMAN: Okay. Then,
7 back to Sanaee.

8 MS. IYAMA: So there's a second
9 comment box related to the regulatory regimes.
10 Can I --

11 FACILITATOR BROOKMAN: Yes. Let's
12 make sure we finish. I didn't think we
13 finished with this one yet. Let's scan
14 through this, and see if we can get additional
15 comment on these four items.

16 Steve Rosenstock first.

17 MR. ROSENSTOCK: Steve Rosenstock,
18 EEI. Please forgive me if I'm going to sound
19 like a broken record here, but I'm a little
20 worried, especially on 2-9. It says,
21 "Increase the benefits of using VSDs in the
22 field." This makes it sound like you are

1 trying to push VSDs. And as I said before,
2 there is other technologies that could be used
3 with these products.

4 And so in terms of extending -- you
5 know, in terms of I'll say an extended
6 product, if you're going to look at
7 technologies that might be included with fans
8 and motors, then it just can't be VSDs.

9 There might be other technologies
10 that currently exist or will future exist, and
11 to say that you are only going to look at VSDs
12 is very -- number one, it's limiting you.
13 Number two, there are competitive issues
14 involved if a regulation increases the cost of
15 a VSD compared to its competitors or decreases
16 the cost compared to its competitors.

17 So I am -- I know it's just -- I
18 know it might be wordsmithing or minor word,
19 but I think if you are going to do this it has
20 to be -- and it is going to go throughout, but
21 it's VSD or other technologies or all other
22 controls that can be used with these products,

1 because otherwise it is -- I believe it is
2 very -- it is just --

3 FACILITATOR BROOKMAN: We get your
4 point.

5 MR. ROSENSTOCK: Okay. And the
6 second thing is --

7 FACILITATOR BROOKMAN: No, we get
8 it. And you can imagine the Department would
9 want to put a specific issue like this in here
10 to -- as a prompt to receive comment.

11 MR. ROSENSTOCK: And --

12 FACILITATOR BROOKMAN: John
13 Cymbalsky.

14 MR. CYMBALSKY: Yes. We'd like --
15 as we said yesterday, I think if you -- you
16 can actually enumerate what those other
17 control devices are called in your comment.

18 MR. ROSENSTOCK: Sure.

19 MR. CYMBALSKY: I think yesterday
20 you mentioned an on/off switch was one of
21 them.

22 MR. ROSENSTOCK: Well, stage

1 controls or, you know, step function --

2 MR. CYMBALSKY: Yes.

3 MR. ROSENSTOCK: -- controls or --

4 MR. CYMBALSKY: Fine. Whatever
5 they're called now and --

6 MR. ROSENSTOCK: Yes.

7 MR. CYMBALSKY: -- how they are
8 used now. That would be great.

9 MR. LLENZA: This is Charles
10 Llenza, Department of Energy. Also, we are
11 open to changing the nomenclature a little
12 bit, like instead of calling it a VSD,
13 mechanical, you know, devices, control devices
14 of sorts or just propose something. We're
15 open -- we're subject to that.

16 FACILITATOR BROOKMAN: Mark.

17 MR. BUBLITZ: Mark Bublitz, New
18 York Blower Company on behalf of AMCA. I'd
19 like to address Item 2-11, how often and in
20 what circumstances applications are
21 understood. In terms of fan performance, we
22 typically understand that air flow and

1 pressure -- but that's only at one specific
2 operating point at which the fan is sized and
3 sold.

4 For industrial applications, the
5 intended application is often known, but many
6 times it's down the channel, sales rep or even
7 post the sales rep. And then, for commercial
8 applications, it is less known for fans that
9 are sold. And the distributors, it could be
10 rarely known. You'd probably have to contact
11 individual manufacturers to get more detailed
12 information, but that was the consensus of our
13 team.

14 FACILITATOR BROOKMAN: Okay. Okay.
15 Yes, please. Say your name.

16 MR. TROMBLEY: Dan Trombley, ACEEE,
17 in regards to the definition of VSD. I'm
18 wondering if there is kind of two things that
19 we are looking at here, one being a way to
20 sort of statically change the speed of the
21 fan, like the belt drive that they described
22 -- that AMCA was describing earlier, that you

1 basically do one -- so you can do it
2 occasionally, like to update the system.

3 But the other is more of an
4 automatic control that is not -- just use of a
5 lay term of real time. That includes some
6 kind of variable speed drive with the sensors
7 and controls to actually move it. So I'm
8 wondering if there's -- that issue is explored
9 here.

10 FACILITATOR BROOKMAN: Okay. Thank
11 you. Yes.

12 Did you wish to comment?

13 MR. STEVENS: Just one comment on
14 Number 2-12.

15 FACILITATOR BROOKMAN: This is
16 Mark. Go ahead, Mark.

17 MR. STEVENS: Mark Stevens from
18 AMCA. I'm sorry. That AMCA concurs with the
19 upper limit, the 98-inch upper limit that was
20 in the framework document.

21 FACILITATOR BROOKMAN: Yes.

22 MR. STEVENS: But we wanted to call

1 attention to the fact that most labs can test
2 sizes much smaller than 98 inches. They are
3 typically in the 38-, 39-inch, or one meter
4 fans as their maximum.

5 But we don't find that to be a
6 particular problem because we use the fan
7 laws, the affinity laws, to calculate larger
8 size performance from smaller size
9 performance. And generally, because fan
10 efficiency increases with size, it leads to
11 conservative prediction of performance.

12 FACILITATOR BROOKMAN: Okay. Let's
13 move on to the next comment box.

14 MS. IYAMA: Okay. So Item 2-14,
15 DOE requests comments on covering fan plus
16 motors with motor-powered requirements between
17 125 watt and 500 kilowatts for this
18 rulemaking.

19 DOE requests comments on what
20 percentage of fan motors are covered by the
21 small and medium electric motor standards.
22 DOE seeks comment on the market share by fan

1 type and applications of fans that are driven
2 by equipment other than electric motors.

3 DOE requests comments on fan
4 transmission types, and DOE requests comments
5 on the VSD sold with fans and whether there is
6 efficiency variability amongst VSDs.

7 FACILITATOR BROOKMAN: Let's start
8 at the top. Mark.

9 MR. STEVENS: Mark Stevens again
10 from AMCA. We have a question on Item 2-14.
11 It looks like this is a reference to EC 327.
12 But the framework document wasn't clear as to
13 what power was being referenced. 327 talks
14 about motor input power, but the framework
15 document wasn't clear as to what power was
16 being referred to. Is this shaft power or
17 name plate power or motor input power?

18 MS. IYAMA: I believe it's the
19 motor name plate power.

20 MR. STEVENS: Motor name plate
21 power? So it's different from 327.

22 MS. IYAMA: I need to doublecheck

1 on this. I'm sorry. Unless --

2 FACILITATOR BROOKMAN: We'll have
3 to check on that.

4 MR. STEVENS: Okay.

5 FACILITATOR BROOKMAN: Okay. Steve
6 Rosenstock.

7 MR. ROSENSTOCK: Thank you for that
8 clarification. Steve Rosenstock, EEI. If
9 it's motor input power, then you're really
10 talking about -- with those type of power
11 usages, you're basically talking about motors
12 that are about one-eighth horsepower up to
13 about one-half horsepower. It might be, you
14 know, in that range.

15 So, really, you are -- kW, I'm
16 sorry, it's one-eighth horsepower up to about
17 750 -- probably about 750 horsepower then. So
18 that's quite the range, and in fact it is
19 higher than the -- well, motors only go up to
20 500 horse -- yes, that's quite the range.
21 Yes. But you're talking as low as one-eighth
22 of a horsepower.

1 So, again, there is an issue there.
2 And that could be in a whole bunch of, I'll
3 say, residential/consumer products. So,
4 again, that is -- using that, it's obviously a
5 very huge scope that, you know, again, it's a
6 matter of -- in terms of energy usage,
7 especially going after the really small ones,
8 I don't know if it's really -- for first
9 rulemaking if you really wanted to go that
10 low.

11 Thank you.

12 FACILITATOR BROOKMAN: So I'm
13 looking -- Sanaee, I'm looking at 2-14. What
14 were you hoping to get by way of comment with
15 this question? I'm not quite clear myself.

16 MS. IYAMA: I think this is also
17 referencing to the European regulation,
18 because they have those limits on the motors
19 that are within their fan regulation.

20 FACILITATOR BROOKMAN: Okay.

21 MS. IYAMA: And so it's just to
22 request feedback on what stakeholders here

1 have to say about these criterias that --

2 FACILITATOR BROOKMAN: Okay.

3 MS. IYAMA: -- Europe is using.

4 FACILITATOR BROOKMAN: So I don't
5 think we've received any comment on this yet.
6 What about this range, any comments on that?

7 Michael?

8 MR. IVANOVICH: Michael Ivanovich,
9 AMCA International. AMCA advocates that the
10 lower range be greater than five horsepower to
11 be consistent with 90.1 2013, and our IECC
12 proposal for IECC 2015. This lower range
13 would accommodate what we consider to be a
14 reasonable Phase 1 approach to regulating
15 fans, as Steve Rosenstock pointed out. Great
16 segue, Steve.

17 That this net being cast by the
18 framework document is huge, and we think that
19 this is -- it would be a tremendous burden on
20 small businesses, you know, that compromise 80
21 percent of our membership.

22 FACILITATOR BROOKMAN: So not

1 covered below five horsepower.

2 MR. IVANOVICH: That's right.

3 FACILITATOR BROOKMAN: Okay. Gary.

4 MR. IVANOVICH: Five horsepower --
5 excuse me. Not covered five horsepower and
6 below.

7 FACILITATOR BROOKMAN: Right,
8 right.

9 MR. FERNSTROM: So Gary Fernstrom
10 for the California utilities. We support
11 DOE's recommended range in the framework from
12 125 watts to 500 kW, because although there
13 may be relatively less savings with the
14 smaller size equipment, there is pervasively a
15 lot more of it.

16 And we shouldn't forego the
17 opportunity to look at cost effective energy
18 efficiency improvement across the broad range
19 of product in the market, particularly those
20 smaller units that are utilized by small
21 businesses where the cost of their operation
22 is reflected in their utility bills.

1 FACILITATOR BROOKMAN: Okay.

2 Louis.

3 MR. STARR: One of the things, I
4 think the thought process is kind of getting
5 those -- the European Union and the American
6 standard to kind of match up in terms of
7 having to produce to more than one market.

8 But perhaps another thought might
9 be is kind of limiting it to three-phased
10 motors, and that would be probably in the half
11 to one horsepower range as a bottom limit, and
12 then go on up to -- some are higher limit.
13 That makes sense.

14 FACILITATOR BROOKMAN: Okay. Thank
15 you.

16 Dan?

17 MR. HARTLEIN: Yes. I'm going to
18 take on 2-16, if we're ready to move on.

19 FACILITATOR BROOKMAN: Okay. Yes.

20 MR. HARTLEIN: So on 2-16, AMCA
21 does not have that data, so we are not in a
22 position to present that at this time.

1 On 2-17, I'm just going to go
2 through a few of these in order --

3 FACILITATOR BROOKMAN: Please do.

4 MR. HARTLEIN: -- if that's okay.

5 FACILITATOR BROOKMAN: That's good.

6 MR. HARTLEIN: On 2-17, we believe
7 that -- in the commercial business that the
8 fans are always driven by an electric motor.
9 However, the industrial business within these
10 categories are some fans that can become steam
11 turbine-driven, and we have seen some
12 combustion engine drives as well in this
13 range.

14 On 2-18, DOE requests comment on
15 transmission types to be considered in the
16 rulemaking, and we believe that the
17 transmission types that have been defined are
18 adequate.

19 And on 2-19, DOE requests comment
20 on the types of VSD sold with fans and whether
21 there is efficiency variability, and AMCA
22 would just like to reiterate that we really

1 don't have the expertise in this area, because
2 more often than not we are not selling the
3 variable speed drive or the variable frequency
4 drive in this case. So it's outside of our
5 realm.

6 FACILITATOR BROOKMAN: Okay.

7 MR. HARTLEIN: Okay?

8 FACILITATOR BROOKMAN: Thank you.
9 That was systematic.

10 Andrew.

11 MR. deLASKI: Just a follow up to
12 Michael on the first question there on the
13 range.

14 FACILITATOR BROOKMAN: Andrew, I'm
15 sorry. You need to get closer.

16 MR. deLASKI: I understand that the
17 existing definitions used in ASHRAE cover five
18 horsepower and greater.

19 MR. IVANOVICH: Over five
20 horsepower.

21 MR. deLASKI: Over five horsepower,
22 so greater than five horsepower.

1 MR. IVANOVICH: Yes.

2 MR. deLASKI: Great. Thanks for
3 that clarification. You know, to me this is a
4 data question, and the data question is, you
5 know, what are the -- in terms of the total
6 horsepower sold to the marketplace, so what --
7 how much horsepower is being sold that's under
8 five horsepower?

9 And what is the opportunity to
10 improve efficiency in that -- those products?
11 So it really comes down to a data question. I
12 think one of my colleagues said that there is
13 an ASHRAE paper suggesting maybe a third of
14 horsepower.

15 So my understanding is that there
16 is a lot of horsepower going out there. I
17 don't know what the opportunity is there, but
18 it strikes me as more than a de minimis
19 portion of the market. Is that a fair
20 characterization?

21 MR. IVANOVICH: Well, a couple of
22 points on that. One of them is that our rough

1 estimates based on the data that are available
2 from our members today, we estimate that
3 keeping it above five horsepower will still
4 address 73 percent of the connected horsepower
5 load in energy usage.

6 However, just to bring out, you
7 know, we're not going to fight -- or, you
8 know, we're going to concede the upper range
9 on the limit, so there is a lot of opportunity
10 on the upper range. And we also think that
11 although that energy savings may be out there,
12 we are advocating a more phased approach to
13 addressing it.

14 I mean, again, going after that
15 large of a scope on your first round would be
16 very difficult.

17 FACILITATOR BROOKMAN: So say a
18 little more about the phased approach. How
19 would you see that?

20 MR. IVANOVICH: Well, it's just
21 like you didn't regulate motors all at once.
22 You didn't regulate every type and every size

1 of motor. The way that this framework is
2 scoping out it looks like you are regulating
3 every type of fan, almost every size, using
4 commercial and industrial buildings.

5 FACILITATOR BROOKMAN: Charles
6 Llenza. Coming back to you, Gary.

7 MR. LLENZA: Yes. This doesn't
8 limit us from separating those smaller motors
9 and just doing a different level of standard
10 for those motors. So -- I mean, for those
11 fans, so --

12 MR. IVANOVICH: That's true, but we
13 are also talking about businesses that would
14 have to be compliant with those regulations
15 right off the bat. So --

16 MR. LLENZA: Wow.

17 MR. IVANOVICH: -- the regulatory
18 burden is still there, even though they might
19 not have to redesign it.

20 MR. LLENZA: Yes.

21 MR. IVANOVICH: But we're talking
22 six years out, so --

1 FACILITATOR BROOKMAN: Gary
2 Fernstrom.

3 MR. FERNSTROM: I'm puzzled why we
4 are concerned about limiting the energy saving
5 opportunity in deference to their regulatory
6 burden to some segment of the market. There
7 is a recognized regulatory burden with any of
8 these standards.

9 And if we are going to take the
10 opportunity to invoke them for the
11 environmental benefit, and other benefits they
12 bring, we should address the greatest
13 opportunity possible when we do these
14 rulemakings, not exclude some significant,
15 potentially, as Andrew noted, portion of the
16 savings just because we don't want to regulate
17 everything at once.

18 FACILITATOR BROOKMAN: Andrew.

19 MR. deLASKI: I mean, to me --
20 well, I'll just come back to my first comment,
21 a data question. And, Michael, thank you for
22 the data point on the 73 percent or -- in the

1 scope that you are suggesting, right. And
2 that's the kind of data that we are going to
3 be looking for to kind of understand where the
4 opportunity lies.

5 So then the other piece of that
6 question is -- the other piece of that
7 question that is going to be data-driven is
8 what is the savings opportunity within each of
9 these places, right?

10 So in general, again, very broad
11 generalities, we tend to think that in larger
12 equipment the market does a better job of
13 driving efficiency, because there is more
14 savings there than it does in smaller
15 equipment. And in smaller equipment, in
16 general, we tend to find that the barriers to
17 efficiency are more pervasive.

18 So, because the savings may
19 actually be small for an individual consumer
20 but large for society. So we're hesitant to
21 sort of say here at the beginning, under five
22 horsepower let's just cut it out. I hear you.

1 I understand that there is -- that has impacts
2 for small manufacturers that we have to take
3 into consideration.

4 But I'm hesitant to say here
5 already we know that's not where a big chunk
6 of the savings opportunity is that we should
7 be considering. So, and again, to me it's all
8 about the data.

9 FACILITATOR BROOKMAN: Yes. Rob.

10 MR. BOTELER: Yes. The motor rules
11 referenced a few times, and, you know, in the
12 motor rule we did -- we started out with
13 general purpose product and we started out
14 with one to 200 horsepower.

15 And one of the things that it did
16 is it allowed our engineers to go through and,
17 you know, there's a perception that we as
18 manufacturers have endless resources of design
19 and manufacturing and a lot of capability.

20 And working for a multi-billion
21 dollar a year company, when you sort it down
22 to the size of the division, we really don't

1 have a huge amount of resources. And it
2 allowed us to focus our resources on the core
3 products, the low hanging fruit, and at the
4 same time I think it gave our engineers an
5 opportunity to explore new energy options with
6 the general purpose product that when we were
7 ready to then move into the EISA regulations
8 and expand to other products and increase the
9 efficiency we would gain some knowledge along
10 the way, and it was -- it really benefitted
11 the whole process.

12 FACILITATOR BROOKMAN: Okay. Steve
13 Rosenstock.

14 MR. ROSENSTOCK: Steve Rosenstock,
15 EEI. About 2-16, about percentage of fan
16 owners covered by the small and medium
17 electric motor standards, I know that small
18 motor standards take effect in I think March
19 of 2015. I'll say that goes from about --

20 PARTICIPANT: (Off-microphone
21 comment.)

22 MR. ROSENSTOCK: Okay. Thank you.

1 Sorry. He has that date written on his
2 calendar, I bet.

3 I'm just -- this is -- it's a
4 question in terms of once this date -- and,
5 again, in terms of Andrew, in terms of data,
6 suppose the answer is two-thirds, three-
7 quarters, 90 percent, 100 percent. What is
8 DOE's response? What is DOE -- is DOE still
9 going to have -- look at regulating those
10 motors under this rulemaking?

11 FACILITATOR BROOKMAN: Thank you,
12 Andrew.

13 All right, Steve. Who else did I
14 -- did I see somebody else over here? No.
15 Yes, please. I thought so. Please state your
16 name for the record.

17 MR. SMITH: I'm Wade Smith from
18 AMCA. I just want to read into the record
19 also the smaller sized equipment that use the
20 smaller motors, today those products are
21 manufactured at -- with higher levels of
22 tooling, and, thus, enhancing their

1 performance requires a larger investment
2 relative to the return.

3 And the smaller products are also
4 supported by many very small companies who are
5 members of our association, whose resources
6 and availability of resources to deal with
7 this rulemaking are less than our larger
8 companies.

9 I'll just reiterate, 97 percent of
10 our members have annual sales of less than
11 \$50 million, and 80 percent of our members
12 have sales of less than \$10 million a year.
13 So this is a -- our choice of the five
14 horsepower limit is driven by the realization
15 that it is a segment of the connected load
16 which requires much more investment for much
17 less return, and which is much more impactful
18 on small businesses.

19 Thus, we felt that this rulemaking
20 should focus on the larger size units and
21 allow the smaller units to come along at a
22 later time.

1 Thank you.

2 FACILITATOR BROOKMAN: Thank you.
3 That was helpful. Meg, did you --

4 MS. WALTNER: I have a follow-up
5 question for you, Wade, actually. What
6 percentage would you say of the under-five
7 horsepower -- your members that sell into the
8 under-five horsepower market also sell into
9 European market? What is the crossover like
10 there?

11 MR. SMITH: It's a very small
12 number. I should add that fan products tend
13 not to ship across continents. Designs are
14 exported, and product is manufactured. In
15 other words, the same product will be
16 manufactured on more than one continent, but
17 it is very, very seldom that a product might
18 be made in the United States and shipped to
19 Europe, or vice versa.

20 MS. WALTNER: But is it the same
21 manufacturers selling into that under-five
22 horsepower market in both places or --

1 MR. SMITH: Not of the small
2 businesses.

3 MS. WALTNER: Okay.

4 MR. SMITH: There are some large
5 member companies who work on more than one
6 continent, some of whom work worldwide, yes.

7 MS. WALTNER: Okay. Thank you.

8 MR. deLASKI: Wait. Don't go away.

9 (Laughter.)

10 Another followup question. You
11 know, this is -- the scope issue is one that,
12 you know, we want to be able to -- be able to
13 understand here. The thing I want to
14 understand is you said two points about the
15 smaller fans -- one, that investing in them
16 requires -- is a higher level of tooling than
17 what -- and so more of --

18 FACILITATOR BROOKMAN: Talk to the
19 mic, Andrew.

20 MR. deLASKI: I'm trying to talk to
21 Wade, too.

22 FACILITATOR BROOKMAN: Yes. I

1 know. I know.

2 MR. deLASKI: He's behind me, for
3 those who are --

4 FACILITATOR BROOKMAN: He'll accept
5 it. Go ahead.

6 MR. deLASKI: That more automation
7 is -- it's a more automated process than
8 manufacturing. Is that what I'm hearing?

9 MR. SMITH: Yes.

10 MR. deLASKI: But then also that
11 there is a small manufacturer. So those
12 things sort of seem to be in conflict, that
13 those -- so are small manufacturers highly
14 automated, or is it that the small guys are
15 also trying to play against folks who are
16 bigger but highly automated?

17 MR. SMITH: Yes.

18 (Laughter.)

19 MR. deLASKI: The big guys are
20 there, too, and that's --

21 MR. SMITH: Yes. I mean, you know,
22 in our internal discussions, you know, we have

1 small companies at the table, some of whom are
2 making product with tooling that was created
3 in the 1950s and 1960s, and this is a small
4 family-owned business that has developed these
5 tools out of oak, for example, that, you know,
6 they still use today and to take 50 years of
7 tool and die making for this small company and
8 say, "Now, in five years, you have to change
9 it all."

10 They will just button the -- they
11 will just close their doors. That's the only
12 thing they can do, really.

13 MR. deLASKI: Right. No, I get the
14 point. And do you have a feel for -- or does
15 AMCA have any feel for what portion of that
16 market is served by the small manufacturers
17 who are -- I wouldn't say making it out of oak
18 but using oak equipment, but those small
19 manufacturers who are in that category versus
20 the larger players who are --

21 MR. SMITH: Well, I would say this,
22 that since 97 percent of our members are much

1 smaller than the Federal Government definition
2 of a small business, it is hard to imagine
3 that we would -- I mean, first of all, I don't
4 know the answer to the question.

5 MR. deLASKI: Okay.

6 MR. SMITH: So it would require
7 some research. But take on faith that there
8 is an awful lot of market share and impact on
9 these small manufacturers in this size range.

10 MR. deLASKI: Great. Thanks for
11 that explanation.

12 FACILITATOR BROOKMAN: We have a
13 follow-on. Go ahead.

14 MR. WAGNER: Greg Wagner. As an
15 employee of a small manufacturer of fans, I
16 understand the issues that Wade talked about.
17 We do have highly automated processes, and it
18 is very expensive to change them. But we are
19 a small company. We don't have the resources
20 that I see employed around here today to put
21 this rulemaking in place.

22 We make fans that go into both

1 residential as well as commercial and
2 industrial applications. The question is
3 going to be, how do you differentiate between
4 them? How do you manage that process? We
5 need to get an understanding of what that is
6 in order to be able to understand what we are
7 going to have to do to be able to comply with
8 that.

9 One of the questions that wasn't
10 asked is, what percentage of those fans under
11 that five horsepower are already covered
12 product? Karim and the AHRI folks maintain
13 that a great deal -- a large number of those
14 are already covered products under other
15 regulation.

16 And this increasing burden of extra
17 regulation is a challenge for a small
18 manufacturer like us.

19 FACILITATOR BROOKMAN: Okay. Gary.

20 MR. FERNSTROM: Gary Fernstrom. In
21 this framework meeting, I think this issue has
22 been well framed. I would say rather than

1 speak anecdotally about it and dismiss this
2 opportunity arbitrarily we ought to include it
3 in the rulemaking and study it, so that we can
4 have an objective, factual, on-the-record
5 understanding of what the costs and
6 opportunities are, and then a good decision
7 can be made about what to do with it.

8 FACILITATOR BROOKMAN: Sounds good.
9 I'm glad we've raised it. You're next.

10 MR. GOTHAM: Aaron Gotham with
11 Greenheck Fan. And we are one of the larger
12 manufacturers in the industry. So a couple of
13 questions to follow up on the question about
14 Europe. I would say there is almost no
15 crossover between U.S. and European selling of
16 --

17 FACILITATOR BROOKMAN: We can't
18 hear you, so just get -- yes, thank you.

19 MR. GOTHAM: Okay.

20 FACILITATOR BROOKMAN: I think it's
21 on.

22 MR. GOTHAM: Okay. Within our

1 industry. So we do very little selling,
2 almost none in Europe, actually, and we are
3 one of the larger players. So there -- unlike
4 the pump manufacturers, it seems like there's
5 a lot of EU and U.S. kind of commonality, very
6 different in the fan industry. It really is
7 different continents, very different worlds,
8 for most of our products.

9 The second thing just talking about
10 the small businesses, I do think -- and,
11 again, we are one of the larger ones. I think
12 it would put the small businesses at a
13 competitive disadvantage. I think that we do
14 have the resources to react faster than the
15 small guys, and I do think that, speaking on
16 behalf of small guys, that would really be
17 problematic for them.

18 FACILITATOR BROOKMAN: Okay. Thank
19 you. I think it would be good for us to keep
20 going. We answered all the questions here in
21 this comment box. Any other contributions
22 before we move on?

1 (No response.)

2 Okay. Sanaee.

3 MS. IYAMA: Okay. So next I will
4 go over the test procedure and efficiency
5 metrics section.

6 So when DOE establishes a standard,
7 manufacturers must use a DOE test procedure to
8 ensure compliance with that standard, and to
9 make the representation of the energy use of
10 their product.

11 And as was mentioned earlier, DOE
12 is developing a test procedure for commercial
13 and industrial fans, and the first step in
14 that process is to review existing industry
15 test procedures.

16 Current industry test procedures
17 include the AMCA 210, AMCA 220, and the ISO
18 5801 test procedures. AMCA 210 is applicable
19 to all fan types and is widely recognized and
20 used in the U.S. AMCA 220 includes
21 specifications for air curtain testing, and
22 ISO 5801 is an international standard similar

1 to AMCA 210.

2 Both AMCA 210 and the ISO standard
3 allow testing fans under four test
4 configurations, also referred to as
5 installation categories. And each of them
6 impact the performance output of the test
7 procedure.

8 Therefore, in order to ensure that
9 products are tested in a consistent way and
10 provide comparable results, DOE is considering
11 specifying a single test configuration for
12 equipment class in its DOE test procedure.

13 And here we have comment boxes
14 related to test procedure and efficiency
15 metrics. But first on test procedure DOE
16 requests comment on the use of AMCA 210 as a
17 basis for the development of a DOE test
18 procedure.

19 DOE requests comment on AMCA
20 Standard 220 for measuring performance of
21 cross-flow fans, and DOE requests comment on
22 using a clean air only test procedure for

1 dust, air, or material handling fans.

2 FACILITATOR BROOKMAN: Mark.

3 MR. STEVENS: Mark Stevens from
4 AMCA. I'd like to comment, actually, on these
5 next three items.

6 FACILITATOR BROOKMAN: Please.

7 MR. STEVENS: We do agree with
8 using AMCA 210 for testing fans. We have some
9 comments later on regarding the scope and
10 classifications that will modify the comments
11 I am making right now. But for induced flow
12 fans, I'd like to comment now that AMCA 260
13 should be used for induced flow fans.

14 FACILITATOR BROOKMAN: Say it
15 again, for?

16 MR. STEVENS: Induced flow fans.

17 FACILITATOR BROOKMAN: Induced.
18 Okay.

19 MR. STEVENS: Regarding 3.3,
20 regarding using the AMCA 220 for cross-flow
21 fans, we would say no cross-flow fans. AMCA
22 Standard 220 is a test standard for air

1 curtains. It is not for individual fans.
2 Cross-flow fans would be tested under AMCA
3 210.

4 But, again, later we've got some
5 more comment on whether or not cross-flow fans
6 should be included in the scope of the
7 rulemaking.

8 Regarding 3.6, we propose that,
9 yes, material handling fans should be tested
10 using clean air. Efficiency of the slurry, I
11 suppose you could say, of the material going
12 through a material handling fan is increased
13 by the material in that slurry. But
14 efficiency of a fan is not dependent on
15 density.

16 FACILITATOR BROOKMAN: Okay. Thank
17 you. So that was a pretty comprehensive
18 review of those three additional comments on
19 those three.

20 Okay. We are moving on.

21 MS. IYAMA: Okay. Two more
22 comments. DOE requests comment on which test

1 configuration should be considered for each of
2 the considered equipment classes which are
3 listed here.

4 And then DOE requests comment on
5 requiring an air straightener to reduce air
6 swirl at the outlet for axial fans tested in
7 configuration B or D.

8 FACILITATOR BROOKMAN: Mark?

9 MR. STEVENS: Right. If could go
10 on, again, we have some comments later on
11 regarding the scope of the rulemaking. Again,
12 we'd like to say that AMCA 260 should be used
13 for induced flow fans, and AMCA 210 for the
14 remainder.

15 What we'd also like to suggest is
16 that the manufacturer be allowed to choose the
17 installation type in which their fans are
18 rated, because they are normally catalogued
19 and presented to the public in which -- these
20 ratings are presented to the public in the way
21 their customers use them.

22 And we would think that it would be

1 an undue burden on our manufacturers if they
2 were forced to rate installation types that
3 their customers couldn't use.

4 Regarding 3.8, air straighteners,
5 this is another European construct that, no,
6 we don't agree with using the air straightener
7 for axial fans. Actually, tube axial fans are
8 a subset of axial fans.

9 And we have done a tremendous
10 amount of research on this particular topic,
11 and what the straightener does is actually add
12 uncertainty to the test rather than increase
13 the certainty or the uncertainty of the test,
14 reduce the uncertainty of the test.

15 So, no, we don't agree with the
16 straightener. As a matter of fact, ISO 5801
17 has a new draft, and there is a new work item
18 proposal inside, TC117. AMCA is a technical
19 advisory group to that.

20 The chairman delegation, the
21 secretary, convener, and they have proposed a
22 draft that essentially eliminates the

1 straightener for tube axial fans. But we are
2 going to agree with that.

3 FACILITATOR BROOKMAN: Okay.
4 Interesting. Other comments on these two from
5 other parties? Yes, please.

6 MR. WAGNER: Greg Wagner. I echo
7 AMCA's request that we consider AMCA 210 as
8 the standard for testing most fans. I'll
9 leave aside the cross-flow for other folks.
10 But with regard to the test configuration,
11 absolutely they should be tested in the
12 configuration they are designed to be used to
13 make sure that the performance and outcome is
14 similar to what it is being tested and
15 evaluated under.

16 FACILITATOR BROOKMAN: Okay. Other
17 comments? We're moving on.

18 (No response.)

19 Okay.

20 MS. IYAMA: Okay. So the output
21 performance measurement of the DOE test
22 procedure will be used to develop a metric

1 that will allow comparing fan energy
2 performance across products. This metric
3 could be based on efficiency.

4 Current efficiency definitions for
5 fan include peak total efficiency, which is
6 the ratio of fan air power output to fan shaft
7 power input for the operating conditions for
8 which this value is at its highest.

9 Current fan efficiency definition
10 also include overall efficiency, which is the
11 fan peak total efficiency multiplied by drive
12 components efficiency. These components
13 include the motor, any components between the
14 motor and the power supply, and any mechanical
15 device between the motor and the fan.

16 A potential metric that could be
17 considered for bare shaft fans is the fan
18 efficiency grade, the FEG, as developed by
19 AMCA 205. As shown on this graph, the FEG is
20 efficiency as a function -- peak total
21 efficiency as a function of the fan's impeller
22 diameter. And it does not differentiate

1 across different fan types, and DOE is
2 interested in evaluating an FEG metric by
3 developing fan efficiency grades unique to
4 each equipment class.

5 DOE is also interested in
6 potentially expanding the FEG approach to not
7 only be looking at total peak efficiency as a
8 function of fan impeller diameter, but also as
9 a function of operational parameters, for
10 example, specific speed. So we would be
11 looking at total peak efficiency as a function
12 of impeller diameter and specific speed.

13 In order to provide an example of
14 what this expanded FEG metric could look like,
15 we collected performance data for about a
16 thousand fans, and we plotted peak total
17 efficiency on the vertical axis as a function
18 of impeller diameter and specific speed.

19 This is just an example for the
20 thousand fans that we collected information
21 for. The surface represents the average total
22 peak efficiency. What this means is that for

1 this sample we had 50 percent of our models
2 with a peak total efficiency above that
3 surface, and the other half had total peak
4 efficiencies falling below that surface.

5 So it is the average peak
6 efficiency as a function of impeller diameter
7 and specific speed. And that is a 3D view.
8 And on the next slide it's the same
9 information, but collapsed onto a 2D view.

10 We have the total peak efficiency
11 on the vertical axis, impeller diameter on the
12 horizontal axis, and here the specific speeds
13 are represented as different colors. And here
14 we see that we have something that looks
15 similar to the FEG as developed by AMCA.

16 So that's for the discussion of
17 potential metrics for bare shaft fans. And in
18 the next slides I will discuss potential
19 metrics for combined fan equipments.

20 If DOE is considering covering
21 combined fan equipment, which is what is
22 discussed under regulatory regimes two and

1 three, the metric may need to consider motor
2 efficiency and VSD efficiency. The metric may
3 also need to be able to capture the energy
4 impacts from using a fan with a VSD in
5 comparison to using a fan without a VSD.

6 One example of a metric which
7 incorporates motor and VSD efficiency is the
8 European fan motor efficiency grade, the FMEG,
9 which is expressed in terms of overall
10 efficiency calculated with a VSD compensation
11 factor.

12 So DOE is considering a different
13 metrics approach, and for regulatory regimes
14 two and three, as we saw earlier, we would
15 have two sets of equipment classes. This
16 could be rated -- these two equipment classes
17 could be rated using separate metrics or
18 similar metrics.

19 And here this table provides a
20 summary of the metrics approaches and provides
21 examples for each regulatory regime. So, for
22 example, if we are under a separate metrics

1 approach and under regulatory regime two, we
2 would have two sets of equipment classes, fans
3 sold without VSD and fans sold with a VSD.

4 And for fans sold without VSD one
5 possible option could be to use fan peak total
6 efficiency to compare fans -- fan energy
7 performance across fans sold without VSDs.

8 For fans sold with VSDs, one
9 potential metric option could be to use
10 overall efficiency as the metric to compare
11 fan energy performance across fans sold with
12 VSDs.

13 Another example of a separate
14 metric approach, this time for regulatory
15 regime number three -- so, again, we would
16 have two sets of equipment classes, fans sold
17 without motors, fans sold with motors.

18 For fans sold without motors, one
19 possible metric option could be to use fan
20 peak total efficiency to compare fan energy
21 performance across fans sold without motors.
22 And for fans sold with motors, one possible

1 option would be to use an electric input
2 power-based metric to compare fan energy
3 performance across fans sold with motors.

4 And here we would be evaluating
5 fans sold with motors and fans sold with
6 motors and VSDs under the same category. So
7 we need to be using a metric that allows
8 capturing the energy impacts of using a fan
9 with a VSD in comparison to using a fan
10 without a VSD.

11 So that's it for the test procedure
12 and efficiency metrics section, and we are
13 going to the comment requests. DOE requests
14 comment on the appropriateness of using
15 publicly available performance data in lieu of
16 original test data, so that's for developing
17 the 3D graph that was shown earlier.

18 DOE requests original fan
19 performance data generated from AMCA 210
20 tests. DOE requests comment on the considered
21 efficiency metric approaches for bare shaft
22 fans. DOE requests comments on the European

1 FMEG efficiency metric for fans sold with
2 motors.

3 FACILITATOR BROOKMAN: Yes, Mark.

4 MR. BUBLITZ: Mark Bublitz, New
5 York Blower Company on behalf of AMCA. With
6 respect to 3.9, we would encourage DOE to use
7 AMCA-certified data. That would be data that
8 carries the AMCA seal. Those products are
9 engaged in the CRP-certified ratings program
10 where the AMCA attempts to do its best to
11 validate the published data against certified
12 and tested product.

13 FACILITATOR BROOKMAN: Is that
14 certified against the catalogue or something?

15 MR. BUBLITZ: Yes. Well, really
16 any published data, electronic and
17 printed/published.

18 FACILITATOR BROOKMAN: Okay.

19 MR. BUBLITZ: Item 3.10,
20 technically, that test data is owned by the
21 manufacturer. So I'm sure if you'd contact
22 the manufacturer some, whatever you call it,

1 privacy release, NDA or something, could be
2 released from AMCA.

3 And then, just on Item 3.11, I was
4 wondering if it would be possible to obtain
5 the exact algorithm, the exact equations that
6 were used to produce the 3D -- the precise
7 definition of specific speed. So I'd like to
8 send my data through the same engine to see
9 what we get.

10 That's all my comments. Thank you.

11 FACILITATOR BROOKMAN: Thank you.

12 Anybody want to respond to what --
13 I'm sorry. Anybody that wishes to respond to
14 3.11(B), the EU's FMEG efficiency metric?

15 Yes, please, Tim.

16 MR. KUSKI: Tim Kuski representing
17 AMCA. I would like to reply to Items A, B, and
18 C, all together. But I have a few slides that
19 we are going to bring up --

20 FACILITATOR BROOKMAN: Yes.

21 MR. KUSKI: -- so I'm going to wait
22 until after questions 3.18 through 19 --

1 FACILITATOR BROOKMAN: Okay.

2 MR. KUSKI: -- are complete.

3 FACILITATOR BROOKMAN: Okay. Then,
4 let's go to three -- well, before we move on,
5 then, additional comments -- yes, Gary -- on
6 this first comment box on page 46?

7 MR. FERNSTROM: Gary Fernstrom. I
8 would like to note that we support DOE
9 covering fan motor combinations with the VSD
10 as the design option, in addition to the bare
11 shaft fans in the rulemaking. And we
12 recommend that DOE develop an input power-
13 based metric wire to air efficiency, for
14 example, to reflect the overall system
15 efficiency of fans sold with motors and
16 controls.

17 FACILITATOR BROOKMAN: Okay. Other
18 comments on these before we move on?

19 (No response.)

20 Then we are going on to the next
21 comment box.

22 MS. IYAMA: Okay. So Item 3.11(C),

1 DOE requests comments on the use of overall
2 efficiency for fans sold with both motors and
3 VSDs.

4 3.18, DOE requests comment on the
5 use of input power-based efficiency for fans
6 sold with motors.

7 3.19, DOE requests comment on
8 whether fans that perform under variable load
9 conditions should be required to meet multiple
10 standards.

11 3.20, DOE seeks comment on setting
12 standards based on different efficiency
13 metrics for fans sold alone and fans sold with
14 motors and VSDs.

15 FACILITATOR BROOKMAN: Mark?

16 MR. STEVENS: Yes. We do -- this
17 is Mark from AMCA. We do have some further
18 comments, but I think the slides from Tim will
19 put this in -- our further comments on these
20 questions into context. So maybe we can go
21 through the slides first and then make our
22 comments.

1 FACILITATOR BROOKMAN: Okay. That
2 sounds good.

3 Jack, can you queue or --

4 MS. IYAMA: I can do it.

5 FACILITATOR BROOKMAN: Sanaee has
6 got it. Okay.

7 (Pause.)

8 MR. KUSKI: Tim Kuski with AMCA.
9 These issues of the metric are very important,
10 so I want you to give me about five minutes to
11 walk through these few slides and talk about
12 the bare shaft metrics and the overall
13 metrics.

14 And I'm going to start with the FEG
15 and commenting on it. FEG is a very good
16 indicator of aerodynamic fan quality for fans
17 with ducted discharges. Specifying FEG-only
18 is not a guarantee of energy savings, however.

19 AMCA recognized this when we
20 created Standard 205, which defines a fan
21 efficiency grade. And in there we required
22 that the fan must be selected within 15 points

1 of peak total efficiency in an effort to save
2 energy.

3 So what you see on the screen up
4 here, in our industry fans are typically
5 selected with electronic selection software
6 where design engineer enters CFM and pressure.
7 Here there are seven different sizes,
8 different wheel diameters. And if you look at
9 the first column they are from 36 inches up to
10 66 inches, and it is only one model of fan.
11 It is a belt-driven, air-foil, double-width
12 fan.

13 But all of these will do 80,000 CFM
14 at three inches of pressure. And look at the
15 FEG column. Every one of them is an FEG 85,
16 which indicates, if selected properly, that
17 these are very efficient fans.

18 But look at the shaft brake
19 horsepower over in column four. For the 36-
20 inch fan, the smallest fan, it requires 114
21 horsepower to do that. And for the 66-inch
22 diameter, the biggest fan, it requires 50

1 brake horsepower. So there is a two-to-one
2 ratio there, more than two to one in power.

3 And, unfortunately, first cost is
4 typically the major driver for our customers
5 that select these fans. So most likely they
6 would pick a 40-inch fan here, lowest cost,
7 and it's only 62 percent total efficiency.

8 Next slide, please. Number seven.

9 So what I want to demonstrate here
10 is the wide range of efficiencies found in a
11 fan. And I'm not a motor expert, but I do
12 know motor efficiencies stay pretty constant
13 from full load to about half load. They drop
14 a little bit. In fans, however, they drop a
15 lot.

16 So what we have here is a fan
17 curve. The solid line is fan total pressure.
18 There is the CFM. And the dashed line is
19 total efficiency versus CFM. And this is a
20 constant RPM fan curve, so this fan would have
21 a stable operating range from about 60,000 CFM
22 to 120,000 CFM.

1 Now, the efficiency varies widely
2 over this range, this CFM range. It peaks out
3 at about 83 percent at 80,000 CFM, and it
4 drops to a low of less than 50 percent as you
5 move out to its maximum flow or 120,000 CFM.

6 Slide number eight, please.

7 Now, a more reasonable selection
8 range for this fan would be to limit the
9 selection from about 60,000 CFM to 100,000
10 CFM. Now, ASHRAE 90.1, in Addendum U,
11 employed this by specifying not only a minimum
12 fan efficiency grade but that the selection
13 must be within 15 percent of peak total
14 efficiency.

15 That was my answer to 3.11(A). I
16 want to move to 3.11(B) now, which -- go
17 ahead.

18 FACILITATOR BROOKMAN: Let's see if
19 we have questions here.

20 MR. CYMBALSKY: So on the first
21 slide -- John Cymbalsky, DOE. I assume there
22 was a reason why you put the weight column

1 here, but -- and I fully appreciate that your
2 customers may want to know that number. Is
3 that a big issue in how your customers
4 purchase this product? And maybe if you can
5 expand on that a little bit.

6 MR. KUSKI: Tim from AMCA again.
7 You know, they may consider other things other
8 than cost. I said that was the primary
9 driver. But they may consider efficiency
10 sometimes. But they are also concerned about
11 physical size. I think that is very big.

12 And each one of these fans
13 represents about a 10 percent increase in
14 wheel diameter from size to size, so you can
15 imagine the physical cube is getting 10
16 percent bigger length, width, and height.

17 And so, yes, weight does become a
18 feature, an issue. You know, rooftop-mounted
19 equipment or something that is, you know, not
20 sitting at grade level.

21 Another issue that I'm not bringing
22 up at all in any of these slides is sound

1 considerations. The smaller fans running at
2 higher speed will generate more sound energy
3 also.

4 MR. CYMBALSKY: So if you could,
5 all of those features that you mentioned,
6 would you -- are you saying that the
7 efficiency is probably the last thing they are
8 thinking of, or is it in the middle, or --

9 MR. KUSKI: You know, I can
10 speculate on that. However, we have kept
11 track of data within our company of all the
12 fan selections that people have made, and we
13 can demonstrate that they are selected far to
14 the right of peak efficiency. And they are
15 typically one to two sizes smaller fans than
16 they should be.

17 MR. CYMBALSKY: Okay.

18 FACILITATOR BROOKMAN: You said
19 first cost was the big driver.

20 MR. KUSKI: Yes, I did. First cost
21 is the big driver.

22 FACILITATOR BROOKMAN: Okay.

1 MR. CYMBALSKY: Thank you.

2 FACILITATOR BROOKMAN: So did you
3 finish with those slides?

4 MR. KUSKI: I am ready to move on
5 to the next subject. We can just hold that
6 slide for a second.

7 Now, I want to answer 3.11(B),
8 which talks -- which comments on the European
9 FMEG, which is an overall fan efficiency. The
10 main reason AMCA in the United States here
11 selected FEG based on shaft horsepower is
12 because most of the products that we sell at
13 this time are still belt-driven, and the
14 number of different permutations to test and
15 rate all of our motor, belt drive, and motor
16 drive/fan combinations is huge. And I'll get
17 to quantifying that.

18 The Europeans use mostly direct
19 driven equipment, and they have much fewer end
20 items or SKUs, and they selected the fan motor
21 extended product metric.

22 Slide number nine, please.

1 Or, excuse me. Each of the fan
2 manufacturers make many different styles or
3 types of products based on application. A lot
4 of these are belt drive; some of them are
5 direct drive. So I'm just going to let you
6 look at all of those different looking fans.

7 It's a lot broader than just
8 saying, "Hey, I've got a centrifugal, I've got
9 an axial, and I've got a mixed flow." There's
10 lots of different shapes and sizes.

11 Next slide, please.

12 Within each fan type, there are
13 many different sizes. So what I have here is
14 a backward-inclined single-width fan. And if
15 this had wheel diameters from 12 inch to 73
16 inch, you would have 19 different physical
17 sizes within one fan type.

18 Next slide, please.

19 Each fan's size has multiple
20 horsepower motors applied to it, with
21 different enclosures, different voltages,
22 different motor efficiencies. The customer

1 might specify a certain efficiency that might
2 not be NEMA premium, and there is numerous,
3 numerous belt and pulley combinations.

4 Next slide, please.

5 So here is just the typical
6 manufacturer that has, let's say, 40 direct
7 drive fan types and 60 belt drive fan types.
8 And what I am using here, I want you to know,
9 there are some very conservative estimates I
10 have used to drive these permutations, okay?
11 So the numbers I show on the bottom of the
12 page are low.

13 First of all, the direct drive fan,
14 if you assume you have 40 different fan types
15 with 10 sizes per fan type, and five motors
16 for each fan size, you get 2,000 end items or
17 SKUs for the direct drive fan.

18 On the belt drive, if the
19 manufacturer has 60 different fan types, 16
20 sizes per type, 30 motors per size, seven belt
21 drive combinations for each motor, you get
22 201,600 different end items or permutations.

1 So for us it is virtually impossible to test
2 and rate the efficiencies of this motor drive
3 and fan combination.

4 So this is the primary reason AMCA
5 fans produced in the United States we selected
6 the FEG bare shaft metric over the extended
7 product or FMEG metric. And I'll pause here
8 for questions.

9 FACILITATOR BROOKMAN: Bob.

10 MR. BOTELEER: Yes. We put this
11 together to kind of demonstrate, because we
12 were thinking in terms of what we did with
13 motors when we came up with our definition for
14 basic model. And the analogy that I gave them
15 is on motors we looked at just a horsepower
16 speed and enclosure.

17 And we have to submit data for the
18 motor population from one to 200 horsepower.
19 It's 113 ratings, and we are trying to come to
20 grips with what did this translate to when we
21 got to all of the variables that were involved
22 with fans. And it's a pretty significant

1 difference between fans and motors.

2 FACILITATOR BROOKMAN: Okay. Thank
3 you.

4 Yes, Louis.

5 MR. STARR: I had a question back
6 on the slide with the chart. I want to say
7 it's Slide 4 probably. It's the one with all
8 of the fan selections. There you go. That
9 one.

10 I'm wondering on this case here, if
11 they have -- is there is a brake horsepower
12 for CFM limitation on that, would that help in
13 the fan? In other words, it would keep people
14 from selecting too small a wheel for a given
15 flow?

16 I mean, I'm looking on there and
17 you've got efficiency of 56, 62, and 68. And
18 it looks like the horsepower, if you divide it
19 by the CFM you could come up with a number
20 kind of similar to what 90.1 has to have a
21 brake horsepower CFM limitation.

22 If you are selling both items -- a

1 fan and the motor -- could that not be applied
2 in that metric? Or would that not really be
3 practical?

4 MR. KUSKI: Tim from Greenheck.
5 The big problem with a simple CFM per
6 horsepower metric is that always -- that
7 varies with the pressure. It also varies with
8 the CFM. So, you know, I've seen that applied
9 to agricultural fans where the pressure is
10 always constant. It might be an eighth of an
11 inch.

12 And then they also normalize it per
13 fan speed and fan diameter. So they control a
14 lot of the variables, and then they are able
15 to establish a metric like CFM per watt or
16 something like this.

17 MR. STARR: Is that what they are
18 trying to get at with the specific speed, kind
19 of, they are talking about that three-
20 dimensional -- because that's what they are
21 essentially getting into, some of the pressure
22 effects, and what you are trying to achieve

1 with it.

2 MR. KUSKI: I think with -- Tim
3 again from AMCA. With specific speed, there
4 are different types of fan designs that fit
5 themselves well for low pressure/high flow and
6 high pressure/low flow.

7 MR. STARR: Right.

8 MR. KUSKI: And the theoretical
9 peak efficiencies vary across that whole
10 spectrum. Hence, you saw that shape to their
11 chart. So --

12 MR. STARR: If, though, inside of a
13 given classification of fan, like forward
14 curve, you had certain amounts of, you know,
15 requirements for efficiency in that area. And
16 then, when you switch it to another fan type,
17 there was another efficiency requirement. It
18 would kind of be the same graph they had,
19 except it would have different heights of
20 roofs in it.

21 MR. KUSKI: You are correct. Yes.

22 MR. STARR: So that would maybe

1 work. Okay.

2 MR. KUSKI: Yes.

3 FACILITATOR BROOKMAN: Dan, did you
4 want to comment here?

5 MR. HARTLEIN: I was just going to
6 reiterate that one of the things we are trying
7 to make sure that we clarify here is the
8 importance of the proper selection. And if we
9 regulate the fan manufacturer without somehow
10 addressing that issue, the unintended
11 consequences of this becoming worse could show
12 itself.

13 So somehow in this effort the
14 Department of Energy and all of us have to
15 figure out how to solve that problem. Okay?

16 FACILITATOR BROOKMAN: Steve
17 Rosenstock.

18 MR. ROSENSTOCK: Steve Rosenstock,
19 EEI. I understand your concern, but,
20 remember, this is a manufacturing standard,
21 not a design or a selection standard. That is
22 up to the end user. DOE has no control over

1 that.

2 MR. HARTLEIN: Dan Hartlein again
3 from AMCA. I hate to say this, Steve, but it
4 doesn't work then. It has to be addressed.

5 Thank you.

6 FACILITATOR BROOKMAN: Andrew, yes.

7 MR. deLASKI: Andrew deLaski. So
8 the costs go up from the smaller fan to the
9 larger fan with that one anomaly, though.
10 That first one is more expensive. What is
11 going on there?

12 MR. KUSKI: Tim from Greenheck. I
13 would guess that a 36-inch fan is a 125-horse
14 motor, which raises first cost. And it may be
15 a Class 3 construction, meaning it has got to
16 run at a much higher speed and pressure.

17 MR. deLASKI: So at some point --
18 so the costs go up, but if you get too small,
19 and then you've got to compensate in other
20 ways that drive your costs up and --

21 MR. KUSKI: That's right. Good
22 question. Good observation.

1 MR. deLASKI: But it strikes me,
2 just about Steve's question, is that, you
3 know, what I'm hearing you guys say is you
4 need to construct this in such a way that you
5 don't foster -- you want to foster better
6 selection. And you can -- so how do we think
7 about this in ways that foster better
8 selection and certainly don't go in the wrong
9 direction.

10 MR. KUSKI: Right.

11 MR. deLASKI: Because I think you
12 can design things that --

13 MR. KUSKI: Right. Because as we
14 design more and more efficient products, it
15 probably costs more to produce them.

16 MR. deLASKI: Right.

17 MR. KUSKI: And if the market
18 doesn't bear that extra cost, they are going
19 to drive down this size.

20 MR. deLASKI: Right. And, again,
21 in response to Steve's question, you can't
22 dictate what consumers choose, but you

1 certainly can affect relative prices and that
2 will affect consumer choices.

3 FACILITATOR BROOKMAN: Yes. Go
4 ahead, Dan.

5 MR. HARTLEIN: Yes. Again, Dan
6 from Twin City Fan and AMCA. I would just
7 pose the question -- and I agree with Steve
8 that, you know, you can't regulate the end
9 user's decision. But perhaps there is an
10 opportunity to regulate the data in what we
11 sell. Just another angle to think about it.

12 I'm not sure how that works, but
13 somehow if we can limit the selection output
14 from our software as part of this, or the
15 marketing materials and the data that is
16 published, I think you can start to have an
17 influence there.

18 Thank you.

19 FACILITATOR BROOKMAN: Karim.

20 MR. AMRANE: Karim Amrane.
21 Actually, one can go even further and say,
22 well, I'm not sure why you need to regulate,

1 because with an efficiency metric like this
2 you are not going to get -- it's not going to
3 tell you how the fans operate and how they are
4 -- their energy consumption.

5 So one could argue that metrics
6 alone will not do it.

7 FACILITATOR BROOKMAN: Michael, did
8 you want to follow on?

9 MR. IVANOVICH: This is Michael
10 Ivanovich, AMCA International. And to
11 reiterate, this is why the AMCA 205 standard
12 has not only the efficiency definition -- you
13 know, it defines how to calculate a fan
14 efficiency grade, but also includes that 15
15 percentage point selection window, which has
16 been adopted into all of the codes and
17 standards and have adopted AMCA 205.

18 FACILITATOR BROOKMAN: Steve
19 Rosenstock.

20 MR. ROSENSTOCK: Steve Rosenstock,
21 EEI. I appreciate all of the feedback. And,
22 again, as we go forward, we also have to

1 remember that the standard is for new and
2 replacement fans.

3 So in areas where the fans are
4 already on a space constrained roof, or
5 enclosure inside a building, depending on how
6 the standard eventually is structured, if it
7 somehow is structured that, you know, you can
8 only use a 54-inch fan, or something like
9 that, there might be some issues with the
10 replacement market. Again, hopefully that
11 won't happen. Hopefully, it will be designed
12 in a way -- but, again, just thinking about,
13 you know, the space constraint can be an issue
14 in retrofits.

15 FACILITATOR BROOKMAN: Do you have
16 more to --

17 MR. KUSKI: I am finished with the
18 slides.

19 FACILITATOR BROOKMAN: Yes. Okay.

20 MR. KUSKI: And then I've got one
21 more comment on 3-11(C).

22 FACILITATOR BROOKMAN: Please do.

1 Yes.

2 MR. KUSKI: And that's the overall
3 efficiency of fans sold with motors and VSDs.
4 First of all, like you heard a couple of times
5 this morning, fan manufacturers don't sell to
6 VFDs.

7 Second, and -- I'm saying VFDs,
8 variable frequency drives, the electronics.

9 FACILITATOR BROOKMAN: I thought
10 you said F, right, yes.

11 MR. KUSKI: Frank. Very --

12 FACILITATOR BROOKMAN: Yes.

13 MR. KUSKI: Second, these VFDs are
14 unregulated, and there is not a lot of
15 accurate efficiency information out there
16 right now. It is hard for us to be held
17 accountable for the efficiency of a product
18 that we don't manufacturer; we simply purchase
19 it.

20 And my whole permutation slide, if
21 you had VFDs on top of that and that gets, you
22 know, another order of magnitude added to

1 it --

2 FACILITATOR BROOKMAN: I think I
3 know the answer. You are careful to
4 differentiate between VFDs and VSDs. So what
5 about VSDs?

6 MR. KUSKI: Most of our belt driven
7 products you could say have a VSD, especially
8 15-horsepower and over. They are adjustable
9 in situ. And I guess over 15 horsepower, if
10 you had a belt drive, even though it is a
11 fixed pitch pulley, you can simply change a
12 pulley in the field to match to a certain load
13 point.

14 FACILITATOR BROOKMAN: Yes. See,
15 now that was -- to me that was the definition
16 of -- this other gentleman was referring to
17 where it was a part of the VSD, was a part of
18 a system where you've got controls and, you
19 know, it wasn't an adjustment in the field
20 that would customize, but -- right? It would
21 be -- you know, that's what I was thinking,
22 but that was just me.

1 Okay. Michael.

2 MR. IVANOVICH: Just on the 3-20 a
3 little bit, going back to the DOE proposed
4 definition of fan manufacturer, it is an
5 entity responsible for assembling a fan into a
6 testable configuration, such that the fan and
7 power is fit to a shaft, bearings, and in some
8 cases installed with a housing component.

9 That definition of a fan
10 manufacturer doesn't include the extended
11 product aspects, and we are curious how, you
12 know, basically with 3-20, you know, who would
13 be held accountable to an extended product
14 definition, you know, with the efficiency
15 metrics and things like that if the
16 manufacturer doesn't make those products or if
17 they are assembled down the line by a
18 distributor or a contractor.

19 FACILITATOR BROOKMAN: Yes. Yes.
20 That's a question that has been faced in other
21 rulemakings. Steve.

22 MR. ROSENSTOCK: Steve Rosenstock,

1 EEI. If you could go back -- again, these
2 slides are terrific. So comment on Slide 45,
3 and this has to do with I would say 3-20, in
4 terms of 3-20.

5 I will speak on it from a utility
6 and maybe possibly kind of thinking about the
7 customer perspective. If there was a way
8 eventually down the road to harmonize the
9 metrics so that -- to make sure that, you
10 know, it's an apples to apples comparison for
11 the customer, person actually buying the
12 product, I think that will help out immensely.

13 I hope we don't go into a situation
14 where, you know, one efficiency metric, if it
15 says 81 percent and the other one -- or other
16 test method says 85 percent, but the one that
17 says 81 percent will actually have lower
18 energy use and lower energy cost because of
19 the test method.

20 So if there is a way to harmonize,
21 I don't know if it's wire to air or just only
22 using overall efficiency. Among all of the

1 different products, I think that would be of
2 most benefit to the end use customer.

3 And then, if you go back to I'll
4 say -- let's just go to Slide 42. I think it
5 makes it easier, because you have a question
6 about 3-19. This is about the variable load
7 conditions.

8 Just as I have been involved with
9 appliance standards for longer than I would
10 probably care to admit, typical test procedure
11 or one testing point -- for example, for
12 transformers it is 50 percent load for a
13 liquid filled transformer. For dry type it's
14 35 percent load. EER is 95 degrees ambient,
15 outside air, period. That's it.

16 With this type of system,
17 especially with variable speeds, I mean, right
18 now you're showing like 18 or 19 specific
19 speeds on that chart that a fan could be
20 operating at. So I can see -- you know, if
21 you have a -- I'll just say you have the fans
22 without the variable speed controls -- I'll

1 just say controls -- versus the fan with
2 controls.

3 If there is a way, again, comparing
4 apples to apples, if you had more than one
5 test point condition, to have it the same for
6 both the constant and the variable type of fan
7 applications. Again, I think that would help
8 the market the best.

9 Again, it would be -- again, it
10 would be kind of precedent-setting, just
11 because other appliance standards had to be
12 one point. That's it for the --

13 FACILITATOR BROOKMAN: Okay.

14 MR. ROSENSTOCK: -- efficiency.

15 FACILITATOR BROOKMAN: Mark.

16 MR. STEVENS: This is Mark from
17 AMCA. I just want to clarify what that slide
18 is showing. It's showing peak efficiencies
19 for different types of fans that have
20 characteristic specific speeds. Right? So
21 the speed is a characteristic -- specific
22 speed at peak efficiency, right?

1 MR. ROSENSTOCK: Okay. My thought
2 was suppose you have a fan -- a variable speed
3 fan with different, you know -- okay.

4 FACILITATOR BROOKMAN: Tim. I'll
5 come back to you, Louis. Tim.

6 MR. KUSKI: Tim from AMCA. The
7 primary reason we are advocating the FEG or
8 the fan shaft brake horsepower is because we
9 can conduct a very simple test. That fan
10 curve I had up a few slides ago, we can put
11 that up to a chamber and within 20 minutes
12 approximately we know all of those performance
13 points.

14 And by using the fan affinity laws
15 or fan laws, we can generate that curve at all
16 different speeds, the whole matrix of
17 operating points.

18 FACILITATOR BROOKMAN: Louis.

19 MR. STARR: Yes. If you'd switch
20 back to slide 45. One of the things on this
21 one here, if you went with Item 3, since the
22 fan manufacturers don't actually, it sounds

1 like most of the time, sell it with the VFDs,
2 you would really only be subjected to the
3 first one, the bare shaft fans, where you are
4 putting the motor power and the fan and the
5 motor together.

6 And your presentation of where you
7 had the sheet that the -- they were selecting
8 a lot of bad motors, that would take care of
9 that issue by going with Item 3.

10 So, and it sounds like the VFDs,
11 since you don't sell them that way, you don't
12 really need to be concerned. But if you start
13 selling them that way, then it would address
14 some of the concerns you had. So just a
15 thought.

16 FACILITATOR BROOKMAN: Dan.

17 MR. HARTLEIN: If I can clarify, it
18 wasn't selection of bad motors. We were
19 demonstrating selection of bad fans. Maybe --

20 MR. STARR: The combination of bad
21 fans and motors.

22 MR. HARTLEIN: Yes.

1 MR. STARR: In other words,
2 selecting the wrong fan wheel and maybe a more
3 bigger fan wheel instead of using a smaller
4 fan wheel.

5 MR. HARTLEIN: Again, and I don't
6 want to sound like a broken record, but just
7 to reiterate, if we don't find a way to
8 control and encourage the fan to be selected
9 within a certain range of its peak efficiency,
10 everything we do here will be for naught. It
11 will not provide energy savings. We have to
12 figure out how to do that.

13 MR. STARR: Well, one thing is
14 Addendum U kind of hits that side of the fan
15 selection, because it -- and that will be
16 going into think -- but the other side of it
17 is the actual equipment side, which then could
18 also limit some of that problem as well. So
19 I'm thinking the combination of those two
20 would work well.

21 FACILITATOR BROOKMAN: So final
22 comment. Michael? No. Mark?

1 MR. STEVENS: There was a specific
2 -- I'm sorry.

3 FACILITATOR BROOKMAN: Name.

4 MR. STEVENS: Oh. Mark again from
5 AMCA. There was a specific question on EU's
6 FMEG program. And I should mention that AMCA
7 had looked at that, and there were a couple of
8 items inside that regulation that were just
9 unacceptable to the North American
10 manufacturers.

11 And they both had to do with
12 bonuses and penalties. One was a matching of
13 components penalty, a 10 percent penalty. And
14 then there was the part-load compensation
15 factor. It was basically a bonus for folks
16 that sold fans with VSDs.

17 And so those are two things that
18 the North American manufacturers couldn't
19 tolerate actually.

20 Regarding the permutations, you
21 know, Tim is right, you know, that's a very
22 difficult not -- to overcome. There is a task

1 -- but we also understand the desire for a
2 wire to gas type or wire to air efficiency
3 metric. And so at AMCA there is a task force
4 that is looking at this.

5 And so they envisioned three things
6 becoming available. One is the FEG metric,
7 which Tim has talked about quite a bit and
8 very eloquently. A second one is a tested
9 wire to gas. Now, as we mentioned before,
10 there is not many people in the States that
11 are doing that, but we want to make that
12 available in case there is manufacturers that
13 have a limited number of variations of their
14 fans.

15 And, finally, there is another
16 permutation to that and that would be a tested
17 fan efficiency as addressed in AMCA 210, with
18 some standardized losses for motors, belts,
19 VFDs, motors, and so on.

20 And this task force, I need to
21 mention, is not just a North American task
22 force. There is six North Americans on there,

1 and there is four folks from Asia. So it is
2 truly an international task force.

3 We are excited about this, I am
4 actually in particular, because two of the
5 Asian members are Chinese and they happen to
6 be on the Drafting Committee for GB19761,
7 which was mentioned in the rule -- in the
8 framework document as something that could
9 potentially be looked at.

10 But the reason we are excited about
11 that is that we -- we feel that there is an
12 opportunity for harmonization across the globe
13 around this document, and that we anticipate
14 that the Chinese will adopt this AMCA standard
15 because we have part of their folks on this
16 Drafting Committee.

17 FACILITATOR BROOKMAN: Okay. Thank
18 you.

19 MR. STEVENS: All right.

20 FACILITATOR BROOKMAN: Louis?

21 MR. STARR: So it sounds like that
22 document that you are working on -- or test

1 procedure, it seems like it is part -- it is
2 similar to the FMEG, just has improvements to
3 it.

4 MR. STEVENS: Well, right. You
5 know, the -- one of the first documents they
6 are looking at is ISO 12759, which is the
7 underlying ISO document for this EU 327,
8 right?

9 So, but as I mentioned, these
10 compensation factors are just warts that have
11 to be taken off, and I don't think that they
12 are going to -- those won't survive.

13 FACILITATOR BROOKMAN: Okay. So
14 we've covered a lot of ground. And we didn't
15 get quite as far before lunch as we thought we
16 would, but maybe we're not too far off.

17 Let's pause for lunch. It's now
18 12:20. It pretty much takes an hour to eat
19 lunch and get back here. Do not leave the
20 Forrestal Building. For those of you that are
21 not familiar with the Forrestal Building, you
22 go down to the ground floor, and you go about

1 100 yards in that direction and there is a big
2 cafeteria. Up two escalators.

3 You just wear this badge in the
4 room -- in the building. This room will be
5 locked. It will be -- so you can leave your
6 stuff here. You might need an ID to get back
7 in through the security apparatus. I needed
8 one this morning.

9 So good progress this morning, and
10 we'll see you back here to resume at 1:20.

11 (Whereupon, at 12:20 p.m., the proceedings in
12 the foregoing matter recessed for
13 lunch.)

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A F T E R N O O N S E S S I O N

1:22 p.m.

MR. BROOKMAN: Okay, let's resume.

We are going to commence with the Market and Technology Assessment section. We're on about Slide 50 and we're going to hear again from Sanaee.

MS. IYAMA: Okay, so I'll start presenting the rulemaking analysis starting with the content of the preliminary analysis. In the next couple of slides, we'll go through the content of each chapter and I'll start with the Market and Tech, Market and Technology Assessment.

For the Market and Technology Assessment, DOE identifies and characterizes manufacturers of commercial, industrial fans. It establishes equipment classes, estimates shipments and trends in the market; identifies technologies that could improve efficiency, as well as identifies regulatory and non-regulatory initiatives intended to improve the

1 efficiency of the equipment covered under the
2 rulemaking.

3 One main task of the Market and
4 Technology Assessment is to establish the
5 equipment classes. DOE generally sets
6 separate energy conservation standards for
7 each equipment class. Here, on this slide, we
8 have listed the equipment classes that are
9 proposed in the framework document. So first
10 we looked at the different aerodynamic
11 characteristics of the fan. So that's the fan
12 type categories for fans and blowers. We have
13 axial, centrifugal mixed flow and then the
14 blowers. We also divided the equipment
15 classes by whether the fan was housed or
16 unhoused, additional safety features and also
17 by equipment utility, product utility as
18 dictated by the impeller geometry.

19 So generally, the equipment classes
20 are divided by performance-related features
21 that may impact the utility of the product and
22 therefore would justify separate energy

1 conservation standards. And so this list is
2 for a Regulatory Regime 1. And if we were to
3 consider Regulatory Regimes 2 and 3, we would
4 have sort of another set of equipment classes
5 that would mirror this set of equipment
6 classes.

7 MR. BROOKMAN: So the equipment
8 class differentiation is important and it may
9 be that the manufacturing community doesn't
10 have a full range of comment at this time, but
11 if you do, that would be useful for the
12 Department.

13 MS. IYAMA: Right. Another part of
14 the Market and Technology Assessment is to
15 identify the technology options to improve
16 efficiency and here we have listed the
17 technology options as identified in the
18 framework document, first for bare shaft fans
19 and then for the fan combined equipment. So
20 you can see them on this slide.

21 Next, we get into the comment
22 boxes. First slide, comments on the market

1 assessment in general, then we have two slides
2 on the comments for equipment classes and then
3 technology options. So I'll start with the
4 first two comments.

5 MR. BROOKMAN: Yes, yes. Let me
6 just make sure I'm with you. Yes.

7 MS. IYAMA: DOE requests
8 information that would contribute to the
9 market assessment for fans. Examples of
10 information include current equipment
11 features, efficiencies and efficiency trends,
12 historical shipments and prices by equipment
13 class. DOE requests comment on the estimates
14 of the number of U.S. fan manufacturers that
15 could be considered small businesses.

16 MR. BROOKMAN: So let's go with
17 those two first.

18 Michael, are you ready?

19 MR. IVANOVICH: Yes, Michael
20 Ivanovich, AMCA International. AMCA advocates
21 that DOE accepts AMCA's proposal for classes
22 that we're going to be coming up within a

1 little bit. AMCA is going to be actively
2 researching its members for market
3 information, but we cannot provide or will not
4 provide pricing information because that
5 information is confidential with our members.
6 DOE would be pursuing that kind of information
7 with individual manufacturers under
8 nondisclosure agreements.

9 AMCA reminds DOE that some data
10 will be hard to find because of the nature of
11 small businesses, they don't all have
12 sophisticated information systems with
13 databases that track shipments and things of
14 that nature, so there's going to be a lot of
15 manual pulling through their data type of
16 thing.

17 MR. BROOKMAN: Is there a common
18 catalogue that's referenced? I'm wondering
19 about how this data from many different
20 companies, how it would be aggregated?

21 MR. IVANOVICH: You have
22 catalogues, but you're looking for some things

1 but like, for example, trend information,
2 historical shipments and prices. That's the
3 kind of thing that they're going to go back
4 into the records manually for many of them.

5 MR. BROOKMAN: Okay.

6 MR. IVANOVICH: We'd also like to
7 say that some information will be available by
8 the comment deadline, but we're going to
9 probably have to provide more information
10 after that deadline as well.

11 MR. BROOKMAN: And 5-2, estimates
12 of the number of U.S. fan manufacturers that
13 could be considered small businesses?

14 MR. IVANOVICH: AMCA affirms DOE's
15 estimate of small businesses is in the
16 ballpark. DOE estimated about 87 percent by
17 employment according to Small Business
18 Administration definitions. Based on our
19 estimates and based on revenue, less than \$10
20 million a year were on 80 percent, and we view
21 these high percentages suggest that a phased
22 approach to regulation is necessary.

1 MR. BROOKMAN: Okay. I welcome any
2 additional comments on these two before we
3 move on.

4 MS. IYAMA: Now comments related to
5 the equipment classes. DOE welcomes comment
6 on performance-related features that DOE
7 should consider when defining fan equipment
8 classes. DOE requests comment on whether
9 transmission type should be considered when
10 determining equipment classes. DOE requests
11 comment on whether the development of separate
12 equipment classes is necessary to accommodate
13 different performance characteristics of fans
14 sold bare shaft versus fans sold with the
15 motor transmission or controls.

16 MR. BROOKMAN: Maybe we could just
17 stop there and do the top three first.
18 Performance-related features of equipment
19 classes. Are we all in a position to -- could
20 you go back to the equipment class?

21 Yes, Tim?

22 MR. KUSKI: Tim Kuski representing

1 AMCA. At the appropriate time, I've got two
2 more slides I'd like to go over, but it would
3 address all of the issues in 5-3 through 5-17.
4 So whenever that's appropriate, I'll address
5 that.

6 MR. BROOKMAN: I'm wondering
7 whether you should do that early or do that
8 after we receive other comments.

9 MR. KUSKI: It may be good to start
10 it out, start the discussion.

11 MR. BROOKMAN: Okay.

12 MS. IYAMA: Since it covers 5-3
13 through 5-17, I didn't read through the
14 comments.

15 MR. BROOKMAN: That's okay. We'll
16 double back.

17 MS. IYAMA: All right.

18 MR. KUSKI: And start on -- I think
19 it's Slide 2. That's it. So these slides
20 aren't as exciting and colorful as the other
21 ones, but it's still going to help tell the
22 story.

1 MR. BROOKMAN: It's pretty
2 exciting.

3 MR. KUSKI: That's right. This is
4 after lunch. I should have had them now. So
5 I guess what we're going to do here is
6 ultimately make some proposed changes to the
7 DOE bare shaft equipment classifications that
8 were shown up on Slide 51. And what we're
9 going to do is we're going to propose 12
10 different classes. However, we're going to
11 suggest that the last two be exempt, so
12 essentially we're proposing ten different
13 equipment classifications for this regulation.

14 And the reason we're doing this is
15 we think the proposed classes are a little too
16 broad in scope and they inconsistently include
17 geometry which was referred to as aerodynamic
18 shape. And it also included application, like
19 one was for dust-laden air and one was for
20 clean air.

21 What we're worried is that the DOE
22 proposal could eliminate complete types of

1 fans that were created to meet a specific
2 application need, impacting their utility and
3 having the unintended consequence of using
4 more energy. So when we laid these new
5 categories out, it was based on application,
6 things like pressure, the way you install it,
7 whether that fan is typically ducted or
8 nonducted. And bear in mind and we know this,
9 the audience may not, but when we design fans
10 to do certain types of jobs, for example, to
11 sit on a rooftop and protect the discharge,
12 from weather from coming in, we impact the
13 efficiency of that fan. We lower it.

14 On this slide we're looking at
15 here, I want to give an example. Right now,
16 one of the first classifications is
17 centrifugal clean air housed equipment. Now
18 right now this would include an air foil
19 centrifugal, a backward curved centrifugal, a
20 backward inclined centrifugal, and a forward
21 curved centrifugal. And the efficiency of
22 those products varies widely. So if there was

1 a minimum setoff there, a minimum efficiency
2 standard established, a whole product line,
3 for example, the forward curved fan could be
4 eliminated.

5 And the forward curved fan is shown
6 in the top image. Excellent solution for
7 ducted fan applications at low pressures and
8 it results in very low first cost. It results
9 in a low energy cost. It has a very compact
10 size and it's used for low sound.

11 In a typical application of forward
12 curved fans in commercial ventilation,
13 bathroom exhaust, return and exhaust fans and
14 air handlers, and general exhaust fans.

15 Next slide, please?

16 Here's another category that could
17 cause some problems and it's low pressure
18 applications without an outlet duct. And a
19 typical application is a power roof
20 ventilator.

21 Even with the low FEG or
22 aerodynamic quality, a power roof ventilator

1 could consume less energy than a more
2 efficient centrifugal fan. The example shown
3 here is roof top application with an operating
4 point of 35,000 CFM at a quarter inch of
5 static pressure.

6 And on the left, the roof propeller
7 fan, which we refer to commonly as the power
8 roof ventilator has a 54-inch axial propeller,
9 consumes only 6.64 break horsepower, but it
10 has an FEG grade that's relatively low, 57.

11 And if that product was eliminated, for
12 example, and you had to put a utility set or a
13 centrifugal fan on the roof, one with an air
14 foil wheel, that would require that
15 centrifugal fan to be a size 49-inch wheel and
16 consume 10.35 horsepower. Again, it's got a
17 very high FEG value, but when those fans are
18 applied at very pressures, you know, near a
19 quarter of an inch, they consume more energy.

20 And then the other factors to look
21 at, we talked about this just a littler
22 earlier, look at the cost factor. The utility

1 fan, even though much more efficient, costs
2 2.4 times as much and consumes more energy.
3 And then there's the weight factor also.

4 Any questions on this slide?

5 MR. BROOKMAN: Question, yes, Alex
6 Lekov, please. Right here.

7 MR. LEKOV: Alex Lekov, Lawrence
8 Berkeley National Laboratory. So just wanted
9 to understand that propeller fans are probably
10 not comparable to the utility fans since those
11 are in the unhooded product class as listed in
12 this table compared to the hooded. Therefore,
13 they have different efficiency standards.

14 MR. KUSKI: Alex, there's also
15 power roof ventilators that have centrifugal
16 wheels in them and they perform a similar
17 function. So if they were to go into a hooded
18 centrifugal category, the centrifugal power
19 roof ventilators would probably be eliminated
20 if a reasonable efficiency was set for like an
21 air foil centrifugal.

22 We're saying the way the categories

1 are, whole product lines that do well at low
2 pressure, could be eliminated if we're not
3 careful.

4 MR. LEKOV: So my question is more
5 specific. Propeller fans are unhooded fans,
6 correct?

7 MR. KUSKI: Well, we have propeller
8 fans that are just in a panel and we'd call
9 that unhooded, but what would you call this
10 fan here with a covering over the top of that?
11 Is that hooded or unhooded?

12 MR. LEKOV: Thank you.

13 MR. BROOKMAN: You could imagine
14 the Department wants to establish not 100 of
15 them and they want to have some -- they want
16 to make sure that they are sort of indicative
17 and sufficient to -- right -- to a majority of
18 the uses out there can fit somehow, amicably,
19 in there, right? Go ahead.

20 MR. HARTLEIN: This is Dan
21 Hartlein, again, for AMCA. We're moving
22 through a process here and we're going to get

1 to a recommendation and category. We're just
2 trying to do a little background data, so bear
3 with us while we go through that.

4 MR. BROOKMAN: Betsy wants to
5 comment here.

6 MS. KOHL: I've been discussing a
7 little bit with Charlie here and we do look at
8 utility impacts when we set standards and also
9 equipment classes. So if there's some product
10 utility or some feature that would counsel
11 separating out that product class, like we
12 don't want to have an unwieldy amount of them,
13 but if there is some reason for a separate
14 product class that would be good to provide in
15 your comments.

16 MR. BROOKMAN: Okay, so we
17 interrupted. Let's keep --

18 MR. KUSKI: And we're getting
19 through that we will provide this in written
20 comment.

21 MR. BROOKMAN: So keep going.
22 You're doing well.

1 MR. KUSKI: I'm going to read
2 through some of the changes we made. What
3 you're looking at is a slide of our resulting
4 recommended product classes. First of all, we
5 start with the DOE recommendation and we
6 divided centrifugal clean air housed into two
7 categories. One was equipment class 3, housed
8 centrifugal backward inclined and the other
9 one was equipment class 4, housed centrifugal
10 forward curved. So in essence, splitting this
11 up would save that product called the forward
12 curved fan which has a lot of good utility,
13 low cost, low sound, low energy.

14 Second, we combined --

15 MR. BROOKMAN: Further
16 differentiated what is characterized as housed
17 or unhoused globally in there, right there.

18 MR. KUSKI: Yes, we do.

19 MR. BROOKMAN: Okay, keep going.

20 MR. KUSKI: We also combined
21 centrifugal dust air housed and centrifugal
22 material handling housed into one category.

1 That's equipment class 5. We called it housed
2 centrifugal radial bladed. That's another
3 class of fan with a different specific speed
4 ratio, different application, high pressure,
5 low flow.

6 The other thing, we eliminated the
7 categories of blowers, both blowers axial and
8 blowers centrifugal because we thought those
9 types of products could be combined into other
10 categories, namely the axial ones and the
11 centrifugal ones.

12 We chose to eliminate safety fans
13 and there was two of those, axial safety fans
14 and centrifugal safety fans and we also chose
15 to eliminate cross flow housed fans as a
16 regulated category. Those fans, their
17 usefulness and utility isn't well measured by
18 fan efficiency, so we chose to leave them out.

19 We did add two categories of power
20 roof ventilators, both the axial and the
21 centrifugal. The axial do very well with
22 nonducted inlets and outlets, of course. And

1 the centrifugals do well if you have a short
2 amount of inlet duct. For example, a grease
3 exhaust application for a restaurant or any
4 other -- a bathroom exhaust fan would be a
5 good example, where a centrifugal exhaust fan
6 is applied. And those would be classes 9 and
7 10.

8 And then we created separate
9 classes for circulating fans and air curtains,
10 classes 11 and 12, but we again, we feel those
11 two should be exempt from this because their
12 efficiency isn't a good measure of their value
13 or their utility.

14 And that's all I have.

15 MR. BROOKMAN: Okay.

16 MR. LLENZA: This is Charles
17 Llenza, the Department of Energy. Does this
18 map at all with the European Union type
19 applications or fan types?

20 MR. STEVENS: I don't know that
21 offhand, but it's pretty close. The EU has
22 much fewer categories than what we're

1 proposing here.

2 MR. KUSKI: This is Tim from AMCA.

3 The Europeans have only six categories, but
4 they separate ducted and nonducted, so they
5 essentially double, almost double those six
6 categories. I think they end up with ten.

7 MR. LLENZA: So another thing to
8 consider in your comments to the Department
9 would be in this mapping that you're providing
10 us, also to provide the test procedures that
11 we should be using for each one of these and
12 that helps us, you know, complete the cycle
13 here for putting things together.

14 MR. STEVENS: Just a comment.

15 MR. BROOKMAN: This is Mark
16 speaking.

17 MR. STEVENS: I'm sorry. This is
18 Mark from AMCA, Mark Stevens. AMCA 210 would
19 be used for all of those classes except for 7.

20 MR. BROOKMAN: So that's an
21 interesting -- okay.

22 (Laughter.)

1 Keep going.

2 MR. KUSKI: Tim from AMCA again.

3 And I forgot to mention we did add that
4 induced flow category because there's a type
5 of product out there used for laboratory fume
6 exhaust applications and these are big fans
7 and they use a lot of energy, but they develop
8 a very high velocity of air at the outlet of
9 these fans in an effort to induce more outside
10 air to create a big momentum of air to carry a
11 plume up high in the air and dilute it.

12 And you pay a penalty for
13 accelerating that air which shows up as a
14 reduced efficiency. So we thought it should
15 have its own category and as Mark mentioned,
16 the AMCA test standard developed for that is
17 AMCA 260.

18 MR. BROOKMAN: I just want to
19 finish this little comment, this segment with
20 Michael and then I'm going to go Louis and
21 Andrew. Louis, you're next.

22 MR. STARR: Would it be accurate to

1 say that you could associate a flow and static
2 pressure for each one of these? In other
3 words, a static pressure and a flow range that
4 are optimal to use these particular fans like
5 let's say you're doing a prop fan for a
6 warehouse and you're trying to get air in and
7 ventilating the house to have a very low
8 static pressure and probably a fairly medium
9 flow. And so it kind of based upon setting up
10 certain parameters it would then define the
11 class and then it would make certain -- in
12 other words, a centrifugal fan wouldn't make
13 sense in that application, right? It would
14 actually be inefficient. So by setting up
15 efficiency with given pressure and flow
16 ranges, would that make a lot of sense for
17 defining efficiency in those classes or not
18 really?

19 MR. BROOKMAN: Dan.

20 MR. HARTLEIN: This is Dan Hartlein
21 again. My answer to that would be yes and no.
22 There are places where that's absolutely an

1 accurate statement and would work. The range
2 of application of house centrifugal, for
3 example, is very, very broad. So the specific
4 speed range across which people manufacture a
5 centrifugal fan is tremendous. So there lies
6 the complexity of what you said in that
7 product, but in many of those products, I
8 think you might be able to do some things
9 there.

10 MR. STARR: And a follow-up
11 question to that, splitting that between
12 housed and unhoused centrifugal fans, what --
13 I missed -- what was -- why would you want an
14 unhoused centrifugal fan? It seems like
15 inherently that's going to help you direct
16 your flow. Some of those efficiencies in
17 terms of how flow comes in, is that more for
18 applications that go in OEM equipment?

19 MR. KUSKI: Tim from AMCA. There
20 has been a lot of change in the market to
21 unhoused fans in the air handling marketplace.
22 And they typically refer to them as plenum

1 fans. And when you take the scroll or the
2 housing off, you lose six or seven points of
3 efficiency. However, you can really minimize
4 the footprint of the air handler and they're
5 concerned about the velocity profile that
6 comes off of that fan and moves through a
7 downstream coil. And this unhooded plenum fan
8 has a very even velocity profile so then the
9 coil efficiency downstream is improved. They
10 can make a good argument for that type of
11 product.

12 MR. STARR: So the other part, too,
13 isn't the unhooded fan a little less
14 expensive? I mean in other words, just the
15 plenum fan. Also, the other part of that,
16 too, is they're not getting their inlet
17 conditions. In other words, their air handler
18 or whatever, they're not getting the proper
19 inlet conditions so the next best option to
20 that is to have an unhooded situation where
21 you just dump air into the side of your fan
22 because you can't get the ductwork coming into

1 the bottom. So it almost seems like it's one
2 of those work arounds and applications. It's
3 like it's a sub-optimal solution to a problem.
4 It's like you're in a fix and then you're
5 applying the solution to that application. Or
6 is it more have real utility that's like this
7 -- if I was designing it right I would do it
8 this way?

9 MR. KUSKI: Tim from AMCA. You
10 never want to mess with the inlet conditions.
11 You don't want to bring in air at a right
12 angle. However, on the outlet, with these
13 plenum fans, they can choose to have air turn
14 90 degrees in that unit or if they build the
15 unit big enough that air can go through in an
16 axial direction. And that's the flexibility
17 that a housed centrifugal would not offer
18 them.

19 MR. BROOKMAN: Dan, go ahead.

20 MR. HARTLEIN: Dan Hartlein again.
21 One of the additional things, we're talking
22 about industrial fans as well. So there is a

1 product that's a plug fan. And the plug fan
2 is quite often designed into the furnace
3 manufacturer's furnace as part of the process
4 and in that scenario it's operating as an
5 unhooded centrifugal fan and frankly, I'm not
6 sure how you would house that centrifugal fan.
7 So just as an example, there's a whole other
8 range of products. And we have a comment.

9 MR. BROOKMAN: Please, find the
10 microphone and add on -- and Andrew, you're
11 next.

12 Your name, please?

13 MR. SREJOVIC: Zika Srejovic from
14 Twin City Fan. And I've been in the industry
15 for a long time and probably was one of the
16 first people to introduce the unhooded plenum
17 fans in air handling units back in the early
18 '70s, and maybe late '60s. And the reason for
19 that was really that it was a good compromise
20 between lower efficiency forward curved fans
21 and higher efficiency of the backward inclined
22 housed fans. And yes, it is true

1 that at a maximum efficiency the housed fan
2 for the same size backward inclined is by five
3 to six percent more efficient. However,
4 somewhere in the mid-range of the performance
5 curve they are about equal and as you get to
6 the lower end of the curve, the unhoused fans
7 can be even more efficient. So that was a
8 good compromise between the fans with forward
9 curved efficiency, perhaps in the high 50s and
10 maybe 60 percent, and the other ones at 80
11 percent, so you end up with a 70, 72 percent
12 unhoused fans as a good solution. And it was
13 space saving for the air handling people
14 particularly, and that became a very, very big
15 market in the last 20 years.

16 MR. BROOKMAN: Okay, thank you.
17 Andrew?

18 MR. deLASKI: I have a general
19 question for Tim. First of all, I think that
20 coming up with ten product classes is
21 admirable. That's a manageable number in
22 terms of that high-level comment.

1 The question I have for you is are
2 there any -- if you think about the market,
3 and I understand that your goal in developing
4 the fan classes was to protect products that
5 offer specific utility, offers specific
6 function to marketplace.

7 The flip side of that is having
8 classes where the classes serve the same
9 utility, so as you look at these ten classes,
10 where do you see that challenge arising the
11 most? Are there classes here where you see
12 the most overlap of application?

13 MR. KUSKI: Tim from AMCA. As you
14 set and continue to set the bar on efficiency
15 metrics in each of these categories, products
16 will fall out of that on the market.
17 Efficient products will fall out. And a good
18 example of that is number 8, centrifugal in-
19 line and mixed flow fans. And there's a very,
20 very broad range of products that fit in the
21 same space, a straight duct and they range
22 from very inexpensive and very inefficient to

1 very expensive and very efficient. Right away
2 with this regulation, there would be whole
3 product classes, for example, square in-line
4 fans with no straightening vanes. That would
5 be eliminated.

6 So I think there's -- am I
7 misunderstanding your question, Andrew, or
8 not?

9 MR. deLASKI: That's helpful. Of
10 course, that all depends on where the standard
11 shakes out and what makes sense for a
12 standard. My question was are there classes
13 in these ten classes that you're recommending
14 for coverage by standards, are there classes
15 where you see competition from one class to
16 the other to meet the same market need?

17 I know it's going to happen some,
18 but where is that happening the most?

19 MR. LLENZA: I think what he's
20 referring to is do any of these classes of
21 fans compete with each other in terms of being
22 used in a market?

1 MR. BROOKMAN: Or in the same kind
2 of application.

3 MR. LLENZA: Right.

4 MR. KUSKI: Yes, they do compete.
5 The fan market is a messy market. There's a
6 lot of products out there. You can put a vane
7 axial fan or a mixed flow fan or a tube axial
8 in the same piece of duct to do 5,000 CFM at
9 an inch and a half. And your tradeoffs are
10 price, efficiency, sound levels, physical
11 size, that type of thing.

12 MR. deLASKI: A standard raises the
13 bar for everything if you're not at the same
14 level, but as you do that, as you have
15 differential effects across these classes,
16 you're going to have effects in the
17 marketplace.

18 MR. KUSKI: Yes.

19 MR. BROOKMAN: Dan.

20 MR. HARTLEIN: I want to add a
21 comment. Dan Hartlein, Twin City Fan
22 representing AMCA here. You used the term

1 protect the classes. I think we actually took
2 this from a little different angle. And the
3 angle we took was where can we set efficiency
4 standards to avoid unintended consequences of
5 this legislation?

6 So we took an approach that was
7 different than trying to protect the class,
8 but really look at where the products within
9 these classes are performing a utility perhaps
10 at the most efficient that we could imagine.
11 Based on applying some of these other higher
12 efficient products, we actually take -- we may
13 have the unintended consequence of a higher
14 energy use. So we spent a lot of time on this
15 and it's, I think, quite well thought out and
16 it was done for that reason more than to
17 protect a particular class of fans, if you
18 will.

19 MR. BROOKMAN: Good. Sanaee,
20 looking at these classes and what they've
21 presented here, do you have any questions for
22 them?

1 MS. IYAMA: Not at this point.

2 MR. BROOKMAN: Not at this point.

3 Okay, so let's go to 52, slide 52.

4 MR. LLENZA: I have a question.

5 MR. BROOKMAN: Charles Llenza, yes.

6 MR. LLENZA: These classes that
7 they presented, does the technical team have
8 any particular questions that the industry
9 should be providing us in terms of data or
10 reasoning or anything else like that?

11 MS. IYAMA: Definitely the
12 reasoning behind why you think forward curved
13 should be separated from backward inclined,
14 etcetera. You explained that already, but
15 giving us the details, the entire reasoning
16 that led to those 10, 12 equipment classes
17 will definitely be helpful. And the
18 indication of overlapping utility, also.

19 MR. BROOKMAN: I guess each one of
20 these classes would require something of a
21 definition as well, right? Okay.

22 Detlef.

1 MR. WESTPHALEN: Detlef Westphalen,
2 Navigant Consulting. I just have a question.
3 A couple of the examples that you provided
4 were like the power roof ventilator versus the
5 centrifugal. If you provided the 15 percent
6 maximum differential, would you run into those
7 situations with that kind of a different, a
8 very different picture? Would the 15 percent
9 rule avoid those situations?

10 MR. KUSKI: Tim from AMCA. If you
11 applied the 15 percent rule, you'd see those
12 same type of variances that I showed you here.
13 So you'd be able to go back and catalog data
14 that you can get online. You'll be able to
15 make similar selections to this.

16 MR. WESTPHALEN: Okay, thanks.

17 MR. BROOKMAN: Louis.

18 MR. STARR: So like a typical HVAC,
19 I will say an air handler, but it could just
20 be something where you're ducting air, you
21 could in that case use a forward curved fan
22 which are basically -- or an air foil fan

1 which has blades that have less pressure drop
2 or you could use a forward curved. The
3 forward curved would be cheaper, but the air
4 foil would be more efficient in doing it. So
5 I think also in your selection curves you end
6 up, it gives you, using Addendum U you have a
7 wider range to select on a forward curved fan
8 that's more efficient and a narrower range on
9 the -- you have a wider range in air foil and
10 a slimmer range in the other one.

11 But in terms of the price, it's
12 still better if you're trying to do something
13 less expensive, you probably would go with
14 just the air foil in the same application. So
15 you're not really necessarily the efficiency,
16 if you split it up into a class, it's kind of
17 what the overlapping of the utility. It seems
18 like at least in that specific example there
19 really is overlapping utility.

20 So when you have two classes that
21 one is naturally a more efficient fan, it
22 seems like there might be a problem in that

1 area, but I mean I guess if there really is
2 specific -- I know there are specific utility
3 where you use a forward curved, but you would
4 not use an air foil.

5 MR. KUSKI: Tim from AMCA. Yes,
6 the main utility is compact size and low
7 sound. You would end up putting a much, much
8 bigger airfoil unit to deliver the same amount
9 of air.

10 MR. BROOKMAN: We have a question
11 from a person online. Danielle Fox writes,
12 "could AMCA explain why unhoused axial fans
13 are in the same class with tube axial fans?"

14 MR. KUSKI: Tim from AMCA. Good
15 question, Danielle.

16 (Laughter.)

17 She found our weak spot.

18 MR. BROOKMAN: Danielle, thank you.
19 Danielle Fox.

20 MR. LLENZA: Just to clarify, it's
21 one of our technical team's parties in
22 California.

1 MR. BROOKMAN: Okay.

2 MR. KUSKI: We argued long and hard
3 where to put tube axial fans whether they
4 should be up in the vane axial category or the
5 panel fan category. Most vane axials are
6 ducted and they're designed for high pressure.
7 Tube axial fans are often ducted, but they're
8 better at low pressures. So we could possibly
9 have them up there.

10 The other thing, panel fans, if you
11 had a nonducted sidewall application and you
12 wanted to raise the efficiency some amount,
13 you could drop a tube axial fan in there and
14 you'd be in some length in there, but you'd
15 get a few points of efficiency.

16 MR. HARTLEIN: I just want to add,
17 Dan Hartlein again, that that debate that we
18 had which was a long one on this, really kind
19 of landed at the fact that in a vane axial fan
20 vane, the turning vanes are there to
21 efficiently redirect a swirl into an axial
22 flow.

1 In the tube axial fan at such low
2 pressures, the vane can actually become a
3 pressure drop. And so the vane at those
4 pressures can actually not accentuate
5 efficiency, but it can actually cost you
6 efficiency.

7 So that's kind of the basis for the
8 ultimate decision to put it there because it's
9 operating without the straightening vane
10 section and at low pressures it will operate
11 better than the fan with the straightening
12 vane section.

13 MR. BROOKMAN: Okay.

14 MR. KUSKI: So Tim from AMCA, I
15 just -- she hit us in a weak spot and there
16 could conceivably, maybe someone could make
17 arguments it should be in its own category,
18 the tube axial fan.

19 MR. BROOKMAN: Okay. Louis, go
20 ahead. I'm eager to move on here. Go ahead.

21 MR. STARR: Just one last thing,
22 the circulation fans, where do exhaust fans

1 for building a bathroom exhaust that type of
2 thing, is that a circulation fan?

3 MR. STEVENS: This is Mark.
4 Actually, it's a circulating fan. It's the
5 fans that would be on your desktop or hanging
6 from the ceiling.

7 MR. STARR: Okay.

8 MR. BROOKMAN: Let's go to Slide
9 52. Another thing the Department is always
10 interested in is to ask industry and everyone
11 for that matter this question about the
12 technology options to improve efficiency.
13 They're wanting to get your thoughts on not
14 only what's here, what's possible and sort of
15 trendline information as well. So maybe you
16 could comment. I'm sure that's going to be in
17 a comment box at some point there.

18 Slide 52 is this listing of
19 technology options.

20 MS. IYAMA: Yes, there are some
21 comments that I could read.

22 MR. BROOKMAN: So what do you

1 think? Gary, you want to start off? Please.

2 MR. FERNSTROM: I wanted to go back
3 to air curtain fan.

4 (Laughter.)

5 And ask if the industry feels
6 there's not an opportunity to improve these or
7 why it thinks they should be exempted?
8 Because we think there are a prevalent number
9 of those and there is an efficiency
10 improvement opportunity associated with them.

11 MR. BROOKMAN: Would someone
12 define, so we're clear what they are? I think
13 we know what they are.

14 Mark?

15 MR. STEVENS: Well, an air curtain
16 is really a device that encloses a fan inside
17 of it. And these fans that are inside are
18 usually either forward curved or radial fans.
19 So an air curtain would be mounted above a
20 door to create somewhat of a partition when
21 the door is open to keep material from going
22 back and forth or across the door, to keep

1 some sort of air conditioning barrier when the
2 door is open.

3 Now why are we suggesting that they
4 be not included? I'm the secretary for ISO
5 Working Group 9 which is part of TC117. And
6 this group is -- Working Group 9 is concerned
7 with air curtains and what they're busy doing
8 is developing a test standard on air curtain
9 effectiveness. And it's not a measure of the
10 efficiency of the unit itself, but how
11 effective is that air curtain in its
12 operation?

13 What they want to measure is the
14 energy going into the air curtain, inclusive
15 of the air conditioning required when air
16 conditioning is operating versus the energy
17 going into the air conditioning when the air
18 curtain is not operating, and characterizing
19 that or defining that as the effectiveness of
20 the air curtain. So that, in their mind, is a
21 better method of determining how well that air
22 curtain is working.

1 MR. FERNSTROM: So if I could
2 restate that your hypothesizing that a less
3 efficient air curtain fan might actually
4 improve the insulating effect and give you
5 greater savings in building cooling or
6 heating.

7 MR. STEVENS: This is Mark. Yes,
8 that's very true. One of the characteristics
9 of an air curtain is a uniform velocity
10 profile at the exit plane of the air curtain.
11 However, those fans that are used to give you
12 that uniform plane are not very efficient of
13 themselves, but they make the air curtain work
14 better.

15 MR. FERNSTROM: Okay, I understand.
16 Thank you.

17 MR. BROOKMAN: Dan.

18 MR. HARTLEIN: Dan Hartlein, again
19 speaking for AMCA. I believe that the logic
20 there and also for circulating fans was
21 exactly the same. These are by fan standards
22 relatively low efficient fans, but they are

1 saving energy by their application. And a
2 circulating fan allows somebody to turn the
3 thermostat down in the winter or up in the
4 summer and allows us to consume less energy by
5 the fact that that product is used.

6 MR. LLENZA: This is Charles
7 Llenza, Department of Energy. Those
8 particular fans, for example, within that
9 category could we not achieve maybe some kind
10 of improvements in efficiency although
11 different than maybe other categories? Could
12 you still achieve efficiencies within that
13 category?

14 MR. HARTLEIN: This is Mark again,
15 it's possible, but again, if you -- what
16 you're really aiming for is a uniform, high
17 velocity profile out the exit plane of that
18 air curtain. And that might mean that that is
19 a terribly inefficient air curtain by itself,
20 but it works great at its duty. So the answer
21 is yes and no. The answer is maybe. There
22 was a similar argument earlier on regarding

1 the fans inside furnaces.

2 MR. BROOKMAN: Okay, thank you.

3 MR. FERNSTROM: So let me go to the
4 air circulation fan. I think I understand the
5 argument for the air curtain, but in my mind
6 an air circulation fan might be a table top
7 fan that you'd put in your house. Yes, or a
8 ceiling fan. For sure, having that air
9 movement maybe makes you feel cooler and might
10 result in a need for less air conditioning
11 energy use. However, that doesn't mean that
12 that terribly inefficient table fan couldn't
13 be made better and still serve the same
14 purpose. So I kind of buy into the argument
15 for the air curtain fan, but I'm having a
16 little more trouble with the circulation fan.

17 MR. BROOKMAN: Michael.

18 MR. IVANOVICH: Michael Ivanovich,
19 AMCA International. I think part of the issue
20 is in terms of the scoping, going after which
21 part of the market first or in phases. And I
22 think the better emphasis of DOE is on the ten

1 classes that AMCA is recommending.

2 MR. BROOKMAN: I want to shift,
3 once again, to Slide 52 and hear from anybody
4 about technology options that might be pursued
5 to advance efficiency and trendlines also.
6 That's also useful and important. Who wants
7 to start? It might be useful to confirm this
8 list.

9 Yes, please. It's Ethan?

10 MR. ROGERS: Yes, Ethan Rogers with
11 ACEEE. One of the thoughts we had about any
12 type of control technology is the inclusion of
13 some type of feedback loop. There has to be a
14 sensor, otherwise the variable speed drive is
15 just an expensive drive with a parasitic load.
16 So I think if you're going to include that in
17 there, there has to be discussion of the fact
18 that it's got some intelligence to it.

19 MR. BROOKMAN: Okay, thank you.
20 Michael?

21 (Pause.)

22 Okay, then we're going to move on.

1 We're now getting behind.

2 Alex, find a microphone.

3 MR. LEKOV: Alex Lekov. Lawrence
4 Berkeley National Laboratory. On second
5 thought, I would like to return to the product
6 classes to get the qualification on the
7 radials fan product class which was identified
8 in the original proposal of the, centrifugal
9 fans was supposed to separate the radial tip
10 bladed, radial and open panel versus the
11 radial with the back plate. And the reason is
12 the radial with the back plate are for -- our
13 understanding based on the literature is for
14 material handling. They have significantly
15 lower efficiency.

16 So just to make sure that at least,
17 maybe not now, but in your responses, to
18 address the issue of possibility of radial
19 with a back plate to be considered at the
20 different efficiency. Thank you.

21 MR. BROOKMAN: Dan?

22 MR. HARTLEIN: Thank you for that.

1 There are some products, actually, that are
2 made specifically for very heavy material
3 handling. You might even call them material
4 pumps. And in our industry those are often
5 cast products that serve a very, very useful
6 purpose. So your clarification is correct and
7 we'll take that up in the written comments.
8 Thank you.

9 MR. BROOKMAN: So the last I heard
10 was no additional comment on the technology
11 options at this point, so we're moving then to
12 -- Sanaee, did we finish most of these comment
13 boxes through this conversation? Effective
14 different blade materials on efficiency.
15 Compatibility issues, certain fans, VSDs,
16 considering VSDs as a means to improve fan
17 efficiency. We kind of touched on that.

18 Yes, Dan.

19 MR. HARTLEIN: This is Dan
20 Hartlein, Twin City Fan and AMCA. There are
21 some compatibility issues with -- or there are
22 some design considerations and perhaps

1 compatibility issues with variable frequency.

2 First, I'd like to clear up a
3 position that we kind of put forward earlier.

4 In the commercial industry, there are very
5 few, if perhaps none, no variable speed drives
6 sold, variable frequency drives sold with the
7 fan. In the industrial market, it happens a
8 little more often. So as we move into the
9 industrial business, maybe 20 percent of the
10 time that a VFD is applied it's purchased from
11 the fan manufacturer. Just for information.

12 The second thing is that in
13 designing for variable frequency operation,
14 variable speed operation, several things have
15 to be considered. One is that there is
16 dynamic considerations for the rotor. And if
17 we design the rotor to operate above what we
18 consider first critical, that's a natural
19 frequency where the fan gets excited and will
20 frankly shake itself to death. Those
21 offending frequencies in the operation range,
22 you can't simply run every fan from zero speed

1 to operating catalog speed. There are places
2 where you have to take and program that out.
3 So that's one clarification.

4 And another clarification we see
5 this probably more in industrial fans than we
6 do in commercial fans, but variable speed
7 operation of a product not designed for it can
8 lead to premature product failure. We have to
9 consider the changes in speed on larger fans
10 as start/stop cycles from a fatigue
11 perspective. So there's a need to consider
12 whether or not the application or the fan
13 itself can handle the variable speed
14 application from a structure and a strain in
15 dynamic resonance perspective.

16 MR. BROOKMAN: Thank you.

17 MR. LLENZA: Charles Llenza,
18 Department of Energy. Also, from a technical
19 point of view the installation of VFD
20 frequency drives, you know, my technical team
21 looked at the details of improper installation
22 of that particular issue. If that

1 installation is not properly done also it
2 could be counter productive to the equipment
3 in terms of its lifespan and also efficiency
4 levels.

5 If you could talk to a little bit
6 about that maybe in your written comments, it
7 would be appreciated.

8 MR. HARTLEIN: Sure, and I'm happy
9 to and prepared to make a brief comment now.
10 Bearing currents, you can actually lead to
11 stray bearings, stray currents grounding
12 through bearings which shortens life
13 drastically.

14 The other comment I would make in
15 variable frequency drives is that our motor
16 suppliers have been moving on what is required
17 in the motor to operate with the variable
18 frequency drives. So that's a moving and
19 evolving standard in and of itself and that's
20 what product that the motor manufacturers are
21 putting in the market that's capable of
22 running with a variable frequency drive.

1 What we would have done or what the
2 motor people would have sold us compatible for
3 a VFD six years ago is no longer offered
4 compatible with a VFD. So that's evolving as
5 well. So a side comment to that complexity.

6 MR. BROOKMAN: Rob?

7 MR. BOTELEER: Rob Boteler. Just to
8 pick up on that. The motors today all have
9 insulated bearings because of the shaft
10 currents in the fan. You end up with the same
11 issue with shaft currents. So I'm sure they'd
12 have to take a look at that and probably add
13 that to the fans.

14 MR. BROOKMAN: Steve?

15 MR. ROSENSTOCK: Steve Rosenstock.
16 On Item 5-18, different blade materials on
17 efficiency, you're asking for like
18 metallurgical or different chemical or plastic
19 kind of -- that type of information in terms
20 of its impact on the efficiency of the fan or
21 the motor or the VSD?

22 MS. IYAMA: I believe it's the

1 impact of using different blade material on
2 the efficiency of the fan.

3 MR. ROSENSTOCK: And again, Steve
4 Rosenstock, so yes, you're talking about the
5 actual metallic or plastic compounds or
6 mixtures that are being used for the blades
7 and what -- if they're having any impact?

8 MR. BROOKMAN: Charles Llenza.

9 MR. LLENZA: Yes, plastic,
10 aluminum, different kind of materials. It
11 also could be a coating. It doesn't
12 necessarily have to be the actual material of
13 the blade, but it could be a coating for a
14 particular use that these fans may have.

15 MR. BROOKMAN: Louis.

16 MR. STARR: Just to note, too, on
17 the utility of having a VFD with a fan is also
18 getting it right size for the application. As
19 things change in a factory and you need to
20 adjust things up and down, and that VFD is
21 beneficial even if you do maybe lose fan
22 efficiency off your best efficiency point.

1 And then in terms of technology,
2 another thing I think they're working on is
3 they're working on the ability to adjust the
4 VFD, the reactive power between the motor and
5 the VFD which can get out of whack. And there
6 is some technology in that area such that you
7 don't have as much losses in your VFDs and
8 between your motors and VFDs and some other
9 things in that which is something that is kind
10 of evolving now. It is kind of some new
11 technology that seems to be coming up.

12 MR. BROOKMAN: So I'm eager for us
13 to pick up the pace here a little bit. The
14 content has been excellent and we're kind of
15 commenting, I think, mostly at the appropriate
16 level, but we've got much more ground to cover
17 here. So we're going to press ahead here.

18 MS. IYAMA: So I'll move on to the
19 next chapter which is the screening analysis.
20 So for the screening analysis DOE will take
21 the technology options that we identified in
22 the Market and Technology Assessment and we'll

1 screen out several of them based on the four
2 following criteria: technological
3 feasibility; practicability to manufacture,
4 install, and service; impacts on product
5 utility or availability to consumers; and
6 impact on health and safety.

7 The remaining technology options
8 are referred to as design options are then fed
9 into the engineering analysis. And here we
10 have a comment box. On the screening
11 analysis, are there any technologies that DOE
12 should not consider because of any of the four
13 screening criteria? If so, which screening
14 criteria apply to the cited technology
15 options?

16 MR. BROOKMAN: No comment at this
17 time? No comment at this time.

18 Thoughts? Steve Rosenstock.

19 MR. ROSENSTOCK: Just one quick
20 thought. Steve Rosenstock. Yes, after seeing
21 the issue with fluorescent lamps and the rare
22 earth material issue and supplies, you were

1 talking about blade materials and I think if
2 there's -- and again, I don't know the
3 technology specifically, but if there's some
4 sort of technology that totally relies on rare
5 earth materials for improved efficiency, I
6 think at some point in the preliminary
7 analysis that you might -- you know, if
8 there's availability issues that should be
9 accounted for. And you maybe might want to
10 screen that out just because of possibility of
11 impact on the market.

12 MR. BROOKMAN: We're moving on.

13 MS. IYAMA: So next I'll let Sam
14 present the engineering analysis.

15 MR. JASINSKI: Thanks, Sanaee. My
16 name is Sam Jasinski from Navigant Consulting.
17 Today, I'll be discussing the methodologies
18 that the Department of Energy uses to conduct
19 the engineering analysis.

20 The purpose of the engineering
21 analysis is to characterize the relationship
22 between manufacturer's selling price and

1 improvements in energy efficiency. So the
2 outcome will be cost efficiency curves for
3 each equipment class similar to the one that
4 you see on the left. Just make a note that
5 this is a stylized version. It's not based on
6 any data. This is just to show what the
7 expected trend would look like. And these
8 cost efficiency curves are then used in
9 downstream analyses like the LCC and payback
10 period analysis, manufacturer impact analysis
11 and employment impact analysis.

12 As we've discussed earlier today,
13 DOE recognizes that the equipment classes
14 identified by DOE cover a large range of fan
15 designs and even within certain fan types, a
16 large range of fan sizes. So to address this,
17 DOE may consider focusing its analysis on a
18 subset of representative equipment classes, so
19 maybe a subset of the total equipment classes
20 and then even within it a representative
21 equipment class, representative units within
22 that class.

1 In the essence of time, I won't
2 read these directly and I think 7-1 there
3 provides some spoilers for some upcoming
4 material that I'll go through. It essentially
5 lays out the methodology that DOE uses for the
6 engineering analysis and there will be an
7 opportunity to comment on those specifics
8 probably a little bit later.

9 I think the important one here is
10 asking manufacturers to provide comment or
11 other interested parties on the methods that
12 are used to improve the efficiency of fans
13 currently. I think this is very much related
14 to the technology option discussion that we
15 had. So I don't know if anybody has anything
16 additional to add to that.

17 MR. BROOKMAN: Additional comments?
18 Yes, Mark.

19 MR. BUBLITZ: This is Mark Bublitz
20 from New York Blower Company representing
21 AMCA. It's a complicated issue and I think we
22 agree to submit written comments in that

1 regard. Your broad categories are sufficient
2 enough, but we prefer the written approach.

3 MR. BROOKMAN: Okay, yes, Dan.

4 MR. HARTLEIN: I know you talked
5 about 7-1 being clear as we go here, but I do
6 want to add a thought that within those
7 equipment classes, we see the fan industry as
8 a pretty mature industry. And the expectation
9 within those classes of finding huge leaps
10 forward in efficiency, I think they're not
11 there.

12 I want to reiterate again the
13 comment we made earlier that probably the
14 greatest gain is in proper selection and
15 application.

16 MR. JASINSKI: Thank you. Some of
17 the data sources --

18 MR. STEVENS: Excuse me. This is
19 Mark from AMCA. 7-3, we did have a comment

20 MR. BROOKMAN: Please, Mark.

21 MR. STEVENS: The question was on
22 scaling, of course. I'm sure you're familiar

1 by now with the fan laws and that's used
2 pretty widely throughout the industry. You're
3 also familiar with the AMCA Certified Ratings
4 Program, I'm sure. As I mentioned earlier the
5 fan laws are used, are allowed to be used
6 within the Certified Ratings Program, but
7 licensees or participants may only rate
8 upward, if the fans are geometrically
9 proportional. So we assume that's what you
10 meant by scaling.

11 The second thing was is that it's
12 very difficult, impossible, to scale wire to
13 gas, so we just wanted to have you keep that
14 in mind.

15 MR. JASINSKI: Yes, I was going to
16 touch on this later. There's a slide about
17 picking the units and scaling. I actually had
18 the chance to sit on the SPC 210 meeting where
19 they were discussing this issue about how the
20 fan efficiency laws don't necessarily apply
21 when you're considering a scope that includes
22 motor or VFD or VSD efficiency as well. So if

1 there's been any progress on characterizing
2 how those things impact the scaling methods
3 that are currently used, that would be very
4 helpful for DOE if you could provide that in
5 written comments.

6 MR. BROOKMAN: Okay. Thanks.

7 MR. JASINSKI: So some of the data
8 sources that DOE will use for the engineering
9 analysis, any publicly-available data from
10 manufacturer websites or equipment literature
11 such as catalogs will be included. Some
12 additional data sources we'll get into later
13 when we start to interview manufacturers under
14 nondisclosure agreements and things of that
15 nature. So at this time, if there is any data
16 that anyone would like to provide --

17 MR. BROOKMAN: AMCA said that they
18 would come forward with data and you have the
19 interviews following that.

20 MR. JASINSKI: Great. This graphic
21 gives a better idea of the process that DOE
22 goes through to develop the cost efficiency

1 curves that I mentioned earlier. To begin
2 with, DOE defines baseline models and the
3 baseline basically determines the
4 characteristics of common or typical models
5 that serve as reference points to assess the
6 changes due to energy conservation standards,
7 so implementation of technology options or any
8 technology or design change that might improve
9 efficiency.

10 Next DOE does reverse engineering
11 and there's sort of a two-pronged approach
12 here on the evaluation of performance or
13 efficiency side, DOE will gather test data
14 available or existing test data or conduct
15 tests to verify efficiency ratings. And then
16 on the cost side, DOE will perform tear-downs
17 and use the inputs from the teardowns into a
18 cost model to generate estimated manufacturer
19 production costs and then manufacturer selling
20 price at these efficiency levels.

21 In addition to the reverse
22 engineering, as I mentioned earlier, there is

1 extensive data collection and interview
2 process where DOE will interview manufacturers
3 and collect manufacturer data on costs and
4 efficiency and those interviews will also help
5 DOE understand those and later on I'll discuss
6 how those interviews are also used to evaluate
7 the impact on manufacturers of potential
8 standards.

9 And finally, developing the curves,
10 DOE uses those inputs to create those cost
11 curves that characterize manufacturer selling
12 price as a function of efficiency.

13 This graphic gets a little bit more
14 detailed about the reverse engineering
15 process. First DOE selects units and this
16 goes back to talking about selecting
17 representative units. Typically, the criteria
18 that DOE will use are to try to get a good
19 subset of the currently available market. It
20 will focus on equipment classes that have a
21 large number of shipments. Within each
22 equipment class, DOE will target

1 manufacturers, many manufacturers, often
2 focusing on those that have large market
3 shares and even within a certain fan type or
4 model, try to get a series, a full series of
5 models to assess the different design options
6 or technologies that might impact. And also
7 size in this particular case will come into
8 play.

9 So then once DOE selects the units,
10 then we'll conduct the physical teardowns in
11 which DOE actually takes apart each piece of
12 equipment and enters into a bill of materials,
13 information such as the material type, the
14 number, weight, size. And typically materials
15 can be categorized into two different
16 categories: fabricated parts, which are parts
17 that are made in-house by the fan
18 manufacturer, and then those that are
19 purchased parts that are supplied. And those
20 are treated somewhat differently. And then
21 each of those DOE inputs what the expected
22 assembly process for each of those is and then

1 ultimately that bill of materials is entered
2 into the manufacturer cost model and it uses
3 that input to estimate manufacturer production
4 costs.

5 MR. BROOKMAN: Rob.

6 MR. BOTELEER: When you look at --
7 Rob Boteler -- when you look at the selection
8 of units, are you thinking that you would do a
9 teardown for each one of the equipment
10 classes? I mean we suggested 10, possibly 12,
11 equipment classes. That's a huge number. I
12 mean with motors we did three units per
13 equipment class I guess we would say.

14 MR. JASINSKI: I think DOE would
15 attempt to include at least one unit from each
16 equipment class, especially if the different,
17 the reasons for differentiating those product
18 or equipment class, excuse me, are so heavily
19 related to performance.

20 Some of the discussions we had are
21 that they're very heavily application based
22 and those applications dictate performance.

1 So unless the piece of equipment is very
2 similar or there are cases where DOE will do
3 what's called a virtual teardown, if there are
4 enough similarities between two, and DOE can
5 gather enough information about what those
6 differences are and adequately estimate the
7 materials, assembly process cost, then it will
8 use maybe a full teardown from one equipment
9 class and then conduct a virtual teardown
10 based on public information for an additional
11 equipment class. But in general, yes, DOE
12 would attempt to tear down, at least one from
13 each equipment class.

14 MR. BROOKMAN: Michael.

15 MR. IVANOVICH: Quick question, if
16 DOE were to receive the extended product
17 approach, would you be tearing down the VFDs
18 in the motors as well?

19 MR. JASINSKI: The VFDs in the
20 motors would be included in the cost model,
21 but most likely as a purchased part because as
22 you're saying they're not manufactured or

1 fabricated by the fan manufacturer.

2 MR. BROOKMAN: Is it Greg?

3 MR. WAGNER: Yes, Greg Wagner.

4 Within each product category, there's a wide
5 range. We just earlier talked about input
6 power from I believe it was 125 to 500,000
7 watts. I saw a price on there of somewhere in
8 the neighborhood of \$50,000 or something for a
9 fan. We don't have anything that sells for
10 let's say one thousandth of that. How do you
11 do a teardown in one category, one product to
12 cover that span, if you will, and have
13 anything that's meaningful?

14 MR. JASINSKI: That's a good
15 question and it's one that I'm going to ask
16 you in about two slides.

17 (Laughter.)

18 But like I said, one approach when
19 dealing with a broad scope like this that
20 includes a lot of different fan types and
21 sizes is to select representative units and
22 then use scaling techniques to use the

1 information from directly analyzed
2 representative units to apply to larger sizes
3 and even in some cases other types of
4 equipment.

5 MR. BROOKMAN: Dan, you want to
6 comment here?

7 MR. HARTLEIN: Just a comment on
8 construction. You grab the smallest fan of
9 one of these classes and the demands, the
10 physical demands, the dynamic stresses are
11 infinitely different than when you get to the
12 larger size in the same class. So that
13 scaling becomes really, really difficult to
14 do.

15 MR. BROOKMAN: Rob.

16 MR. BOTELEER: Being experienced in
17 the scaling community, this is probably one of
18 the most scary things for manufacturers is the
19 scaling for all the reasons that we've just
20 heard. It's the area in my experience that is
21 the only thing that ever got us to a lawsuit
22 was the fact that we had issues with scaling

1 that weren't addressed by the Department.

2 MR. BROOKMAN: Thank you, that's
3 perspective. That's useful.

4 MR. JASINSKI: If you could
5 identify those pitfalls in the written
6 comments so that we can try to do our best to
7 avoid them, that would be very helpful.

8 MR. BROOKMAN: So do we have a
9 comment box?

10 MR. JASINSKI: Yes.

11 MR. BROOKMAN: Summarize this for
12 us.

13 MR. JASINSKI: Okay, so this is
14 essentially just asking for detailed data
15 about performance and incremental costs of
16 achieving higher efficiency. So you know,
17 total incremental cost, incremental cost
18 broken out into certain material costs, labor
19 costs and so forth, any data is welcome and
20 very much appreciated.

21 MR. BROOKMAN: Yes, welcome. Your
22 name for the record.

1 MR. DORIA: Yes, Jordan Doria with
2 Ingersoll Rand. I'm here on behalf of our
3 Trane business, heating and air conditioning.
4 I'm not sure the most appropriate place to ask
5 this question, but I think it's here as we're
6 starting to get into the question of who bears
7 the cost. It seems like there's three sort of
8 broad categories. There's costs to the
9 customer. There's costs to the manufacturer,
10 the fan manufacturer. And then there's impact
11 on energy costs.

12 I think that's an appropriate
13 methodology when we're talking about finished
14 products that are being delivered to the end
15 user, but here as we're often talking about
16 essentially a component in certain
17 applications, it seems like a missing element
18 of analysis is what the impact on costs could
19 be for those charged like in the heating and
20 air conditioning industry, putting it in a
21 certain application. And I can see getting
22 into a chicken or the egg thing here, but

1 depending on what the efficiency standards
2 could ultimately be, that could have a
3 dramatic impact in terms of costs for redesign
4 for manufacturers and others who are using
5 them in applications.

6 So my question really is at any
7 point in this process, are you seeking to try
8 and capture those -- call them downstream or
9 sort of ripple-effect costs that others would
10 bear?

11 MR. JASINSKI: Sure. A lot of the
12 issues that you talk about are picked up in
13 some of the downstream analyses. For
14 instance, we're going to get into making sure
15 we know the distribution channels, the markups
16 at each stage of that distribution channel and
17 then ultimately the life-cycle cost assessment
18 will account for those issues.

19 MR. DORIA: Okay, thank you. Gary.

20 MR. FERNSTROM: Gary Fernstrom.
21 When you do this analysis and assess the costs
22 associated with materials, labor and so on, do

1 you use the near-term cost or the mature
2 market cost, that is, how do you account for
3 the potential reduction in the these costs
4 over time as the production of products
5 increases?

6 MR. JASINSKI: Sure. DOE does not
7 project future costs for things like -- for
8 materials, for instance, DOE uses a five-year
9 average using -- a five-year average for
10 things like copper, steel, things like that
11 from the Bureau of Labor Statistics.

12 MR. BROOKMAN: Steve.

13 MR. ROSENSTOCK: Steve Rosenstock,
14 EEI. A follow up question. For commodity
15 products like that, I can understand that
16 costing methodology, but drives, for example,
17 the cost may decrease as the demand for those
18 products increases in the future. So
19 do you make any allowance for that?

20 MR. JASINSKI: No, in the
21 engineering analysis we try to use current
22 prices.

1 MR. LLENZA: This is Charles Llenza
2 for the Department. We like to use real
3 numbers, so if you had contracts that showed
4 that the cost was being driven down, contracts
5 -- two, three-year out contracts like in the
6 case of LED lighting for certain applications,
7 we had information to that nature that the
8 cost of that particular item was going down.
9 We could use that. But we cannot use pure
10 projections. In other words, we could not
11 take five-year information and project out say
12 if it was a curve that was slanting downward,
13 we couldn't take the endpoints of that curve
14 five years out. It's just not something we
15 can do.

16 MR. FERNSTROM: Thank you.

17 MR. BROOKMAN: Steve.

18 MR. ROSENSTOCK: Steve Rosenstock.
19 Yes, under the -- I'll say the extended
20 regulatory regime where you're looking at the
21 motors and the variable speed drives and any
22 other controls that might be used, it also

1 comes down to a -- there's a lot of
2 information you're trying to gather and I know
3 you do a very good job doing it, but in terms
4 of this effort, are you going to have the
5 resources, not only interview the fan
6 manufacturers to get some of that information,
7 but also the motor manufacturers because their
8 products' prices are also going to be
9 influenced and the drive manufacturers and all
10 the other controls that are out there that
11 haven't even been discussed that could be part
12 of these systems.

13 You could be talking to let's say
14 at least 20 fan manufacturers, 10 motor
15 manufacturers, I don't know how many drive
16 manufacturers and then all the other control
17 manufacturers. But they all could be part of
18 those system costs. Does -- are the resources
19 there to do it?

20 MR. JASINSKI: When scheduling
21 interviews, DOE will prioritize the
22 manufacturers that will be subject to the

1 burden of the standard. However, there have
2 been instances in past rulemakings where to a
3 certain degree some component suppliers were
4 also involved in the interview process.

5 MR. LLENZA: Charles Llenza from
6 the Department of Energy. We also have a
7 database or experience in like the motor
8 manufacturers and other components of this. I
9 mean this has come up in other rulemakings, so
10 we do have knowledge of the industry. And
11 where we don't have knowledge I think we make
12 the effort to go out there, make sure that
13 we're covering hopefully a good population
14 size of a particularly new technology if that
15 arises.

16 MR. BROOKMAN: Let's move on to
17 manufacturer's selling price.

18 MR. JASINSKI: So DOE will also
19 develop estimates for manufacturer's selling
20 price and this is essentially just applying a
21 markup to account for nonproduction costs such
22 as maintenance, depreciation, SG&A, R&D in

1 some cases and DOE intends to estimate the
2 manufacturer markups based on publicly-
3 available financial information such as SEC
4 10Ks and so forth. So I think at this point
5 DOE would like comments on that methodology or
6 any data information about what that potential
7 markup should be.

8 MR. BROOKMAN: Any comments at this
9 point on this method? No? No comments.
10 Okay. Michael?

11 MR. IVANOVICH: We're going to
12 respond to these things when we can, but we
13 just can't give out pricing information just
14 yet.

15 MR. JASINSKI: Sure, that's
16 something that is probably more appropriate
17 during the manufacturer interviews and when
18 NDA is in place. DOE recognizes that so we
19 appreciate that.

20 Next, DOE typically does not
21 include conversion costs in the engineering
22 analysis. Usually, this is something that's

1 evaluated for the manufacturer impact
2 analysis, but the conversion cost just quickly
3 includes investments that might be required to
4 build production facilities for higher
5 efficiency designs and so forth. This is
6 something that gets more into the manufacturer
7 impact analysis which we'll touch on later.

8 And just like anything else, this
9 is one of those cost categories where DOE
10 would typically request data which is usually
11 provided under NDA when we do manufacturer
12 interviews.

13 So I think we've already talked
14 about this a lot in terms of DOE's potential
15 approach to select representative units and
16 then scale results. As I mentioned earlier,
17 within each representative equipment class DOE
18 would select representative fan units in size
19 ranges and specific speed values that have a
20 large number of models. But DOE would plan to
21 evaluate fans across the range of sizes for at
22 least one fan series or more to determine a

1 size efficiency relationship and then use that
2 relationship to scale its results for
3 representative units to smaller or larger
4 units.

5 And we've already touched on these.
6 DOE is essentially asking for feedback and
7 guidance on how to do that appropriately.

8 MR. BROOKMAN: Yes, Mark.

9 MR. BUBLITZ: Mark Bublitz, New
10 York Blower Company representing AMCA. We
11 just encourage DOE, a significant portion of
12 the fan products are not manufactured to
13 inventory. So the term "readily available" is
14 repeated in the framework often. A good chunk
15 of the market, you just can't go find it in a
16 warehouse. It's manufactured to order. So
17 we've encouraged you to sample, get an
18 appropriate sampling technology.

19 MR. JASINSKI: Thank you. As I
20 mentioned earlier, the first step is to
21 identify baseline models. Typically, DOE
22 selects baseline models -- a baseline model

1 for DOE would be one that just meets the
2 previous standard. In this case, there aren't
3 any current standards so DOE would select
4 baseline models that are typical of the least
5 efficient models that have a large number of
6 shipments. DOE requests comment on that
7 approach.

8 MR. BROOKMAN: Yes, Michael.

9 MR. IVANOVICH: With respect to an
10 extended product approach on that, how would
11 you begin to develop a package? How would you
12 select a VFD or a motor to go with a fan?

13 MR. JASINSKI: Well, I think it
14 would be slightly different from the different
15 regimes that we identified. I think under
16 regime number 2, if I'm not mistaken, where
17 the classes are divided by whether or not
18 there is a VSD, essentially it would be
19 similar. I don't believe that there are
20 current efficiency standards for VFDs or VSDs,
21 so it would be a similar approach, select the
22 least efficient.

1 Under regime number 3 -- where VFDs
2 or VSDs are essentially treated as a design
3 option. In those cases the VSD, if they are
4 proved to be much more efficient, they
5 probably would not be included in the
6 baseline. So the baseline would be a piece of
7 equipment that does not use a VSD or a VFD.

8 MR. IVANOVICH: I think part of the
9 concern or the inquiry is that whether the
10 standards use a very wide variety in
11 performance, you know, of those types of
12 equipment and how do we match them up. We'd
13 be interested in hearing more about that.

14 MR. JASINSKI: Sure.

15 MR. LLENZA: We're trying not to
16 necessarily narrow down the options of the
17 manufacturers and the customers. So in doing
18 these rulemakings, when we start defining
19 categories of equipment or groupings, classes,
20 what we call classes, we try not to make it
21 such that it's narrowed down to one specific
22 technology or one piece of equipment. We

1 rather broaden it where we can. In the case
2 of the VSD and the VFD, we would probably more
3 talk about controls and then within that box
4 of controls, we would give you options of
5 choices of things that the manufacturers or
6 the people that are ordering the equipment
7 could do to achieve the same level of
8 efficiency when you use those combinations.

9 So this is an abstract, what we're
10 trying to do. It may not show on the surface,
11 but what we try not to give you -- we don't
12 try to tell you what equipment to use and how
13 to match it up to achieve those efficiencies.
14 We try to provide you as much flexibility as
15 possible.

16 MR. BROOKMAN: Steve Rosenstock.

17 MR. ROSENSTOCK: Steve Rosenstock.

18 In terms of baselines, I think in terms of --
19 especially for your modeling, that if --
20 again, under the extended regime, if you're
21 talking about the motors that are already
22 covered DOE products that the efficiency

1 levels should be assumed to meet the 2010 or
2 upcoming 2015 minimum efficiency standards
3 that are separately regulated by DOE. I'll
4 say for the covered motors.

5 Also, I think in terms of your
6 baseline that you should look at Chapter 6.4
7 and 6.5 of ASHRAE 90.1, use the 2010 standard
8 now or the 2013 standard which will be
9 published by October of this year, I believe,
10 which has significant energy conservation
11 requirements for specific fans, i.e., VAV
12 fans, if they're 10 horsepower or larger. In
13 2010, they have to have some sort of control
14 device to limit their usage of energy at part
15 loads. 2013, we'll have more, I believe,
16 more, obviously more requirements including
17 fan efficiency grade. That should be
18 considered part of the baseline and I think
19 that's very important because especially after
20 DOE does its determination, the states update
21 their standards to 2013, those will be the new
22 minimums throughout the land. Thank you.

1 MR. BROOKMAN: Thank you. Rob.

2 MR. BOTELER: Just to comment, Rob
3 Boteler, just to comment on Steve's point on
4 motors. We have a rulemaking in process right
5 now. We're moving to include all the definite
6 and special purpose and other categories of
7 motors which essentially anything we see here
8 with fans would then have a covered product
9 and it would be at the higher NEMA premium
10 1212 level.

11 MR. BROOKMAN: Michael? Okay.

12 MR. JASINSKI: After establishing
13 the baseline, DOE will then establish
14 intermediate efficiency levels so within a
15 given size selected for analysis, the fan
16 models for which performance data is
17 available, that performance data will be
18 assessed to determine those intermediate
19 levels of efficiency. So DOE requests comment
20 on that approach.

21 MR. BROOKMAN: Any comments here?

22 Yes, Mark.

1 MR. BUBLITZ: Mark Bublitz, New
2 York Blower Company representing AMCA. Can
3 you clarify, it just sounds a little circular,
4 we're going to use --

5 MR. JASINSKI: Sure. Essentially,
6 that would be data availability is big here,
7 whether there's published data in product
8 literature, DOE can use that and identify
9 efficiency levels of -- levels of efficiency
10 at which there are models and compare that
11 grouping of efficiency. It's basically
12 assessing the span of efficiency available on
13 the market compared to back to that baseline.

14 So I'm hearing things like these
15 other standards that -- or building codes that
16 might drive efficiency. There might be an
17 efficiency level where a lot of fans are
18 meeting a certain level from maybe ASHRAE 90.1
19 that are above the baseline that we identify
20 and that would be an efficiency level. Or the
21 FEGs, for example. You see FEG 55, 65, 85.
22 It would be similar, do something similar

1 based on whatever efficiency metric that DOE
2 decides to use with its test procedure. It
3 would just essentially be identifying those
4 levels using that efficiency metric.

5 MR. BROOKMAN: Okay.

6 MR. BUBLITZ: How else would you do
7 it?

8 (Laughter.)

9 MR. BROOKMAN: Okay.

10 MR. JASINSKI: And I essentially
11 explained this in my answer. So DOE requests
12 comments on what the available range of
13 efficiency is. And if they don't, whether or
14 not manufacturers offer fans that have varying
15 efficiencies at different duty cycles or
16 utility.

17 MR. LLENZA: This is Charles
18 Llenza, Department of Energy also. And you
19 know, if we know of any ENERGY STAR
20 requirements for fans, this is a good time to
21 bring it in to make us aware of that, too.

22 MR. BROOKMAN: Do we have any

1 comments here?

2 MR. JASINSKI: I think we had one
3 here.

4 MR. BROOKMAN: Yes, I'm sorry.
5 Tim.

6 MR. KUSKI: Tim with AMCA. I'm
7 still struggling with what is meant by
8 Question 7-14.

9 MR. JASINSKI: An answer might be
10 that within one of the proposed equipment
11 classes that you identified, you can say that
12 there are fans that have range in FEG from 55
13 to 85 or what typical -- the typical span of
14 efficiency might be within a given equipment
15 class.

16 MR. KUSKI: Our fan performance is
17 already publicly available and has third party
18 endorsement by AMCA. I'm confused. I think
19 that information is already there that you can
20 get at. Am I missing something?

21 MR. LLENZA: This is Charles Llenza
22 from the Department. Just make sure you point

1 at it so that we don't miss it.

2 (Laughter.)

3 MR. BROOKMAN: Steve.

4 MR. ROSENSTOCK: Steve Rosenstock.

5 Again, under one of the potential regulatory
6 regimes where you're looking at other
7 controls, variable speed drives, step
8 controls, etcetera, I'm just thinking about
9 other controls for other technologies. I'm
10 not personally and if there is something out
11 there, forgive me, I'm not familiar with an
12 efficiency metric for variable speed drive,
13 the drive itself. So I don't know how you say
14 quote varying levels of efficiency for -- or
15 any other control when it's really the focus
16 is the energy saved by the product that it's
17 controlling. But they will use energy. I
18 mean there's energy used by the drives and
19 other controls and that will vary by the type
20 of control, but I don't know of specific
21 efficiency metrics that can be I'll say added
22 on to or included in with this.

1 MR. JASINSKI: Right. Under that
2 regime, the ultimate goal for DOE would be to
3 assess the range of efficiency of the fan
4 still, not necessarily to VFD. If that
5 information is available for the VFD and that
6 enables DOE to then estimate the efficiency
7 range of the fans, then it would be useful.

8 MR. BROOKMAN: Charles.

9 MR. LLENZA: Yes, I just want to
10 refocus as you stated. We're not really after
11 VSD or VFD efficiency. We're really after fan
12 efficiency. So the metric for efficiency
13 levels of the components is not really the
14 question. It's really as the system, right?
15 The system approach to those.

16 MR. BROOKMAN: Question or comment
17 here, please.

18 MR. SMITH: Yes, Wade Smith with
19 AMCA. So AMCA runs a 40,000 square foot
20 laboratory. It's accredited and we do third
21 party certification of ratings. And all of
22 our member companies who certify the ratings

1 of their products publish those ratings in
2 such a way that the fan efficiency grade, the
3 efficiency at all operating points is in the
4 public domain and it's correct.

5 One of the troubling aspects of the
6 idea of an extended product ruling is that the
7 performance of motors at part load and heavy
8 motor applied to a large fan operates at part
9 load when the fan is at full load, so we don't
10 know what the motor performance is at part
11 load. We don't know what the variable speed
12 drive performance is at full or part load.
13 And so you know, what happened in Europe with
14 12759 is that they fell back upon an
15 assumption about those losses associated with
16 those components.

17 And so it's quite possible to
18 calculate the efficiency of an assembly of
19 these three components based on an estimate of
20 the drive and motor losses, but then what you
21 have at the end of the day is an estimate of
22 the performance of the package. So in our

1 world, we don't deal with estimates. We deal
2 with precision. And in the regulatory world,
3 generally, a published performance level is
4 expected to be achieved. And the test on that
5 ultimately is to take the assembled, in this
6 case, extended product and test it to see if
7 the representation of performance is, in fact,
8 correct.

9 But we don't have a correct
10 representation of the performance at any
11 operating point and that's the discomfort
12 associated with all this. And then when we
13 talk about well, we want to break down the
14 product, but we don't need to break down the
15 drive. It feels foreign to our member
16 companies to be placed in a regulatory chain
17 of command, to ask us to embrace products
18 which we didn't design, we don't manufacture,
19 we don't understand, and for the most part
20 don't sell.

21 That said, they save a lot of
22 energy or have that potential. Let's say it

1 that way. They have that potential to save a
2 lot of energy, but the standards aren't
3 written. We heard a moment ago about changes
4 that are happening in variable speed drives to
5 deal with some of the issues that have
6 happened in the early ones of motors which
7 were authorized for use with variable speed
8 drive six years ago, but today are not
9 authorized for use because problems have
10 arisen that we didn't know about previously.
11 This is a very, very young emerging and very
12 exciting aspect of our industry, but it's a
13 little young -- it's so different than a
14 mature fan industry where you can tear apart
15 and you can deal with and you can find that
16 last two or three percent and we're ready for
17 that.

18 MR. BROOKMAN: Gary.

19 MR. FERNSTROM: Gary Fernstrom. I
20 totally understand that point of view, but
21 being new to this discussion, I'd like to ask
22 doesn't anybody make an integrated air

1 handling device that consists of a fan, a
2 motor, and a drive that might be used in a
3 commercial HVAC system?

4 MR. JASINSKI: Yes.

5 MR. FERNSTROM: Somebody does make
6 that product. Okay, so let me follow on and
7 say why should it not be possible to measure
8 the air out and the electricity in in which
9 case you would capture the whole efficiency of
10 this product at whatever operating points you
11 wanted to measure it at. That doesn't seem
12 like such an impossible task to me.

13 MR. BROOKMAN: Your name, please?

14 MR. HAUER: My name is Armin Hauer
15 of ebm-papst. Yes, this type of air mover
16 exists. It's available like an ECM type of
17 series of products. It's available as
18 complete air mover. It's available in
19 American market today up to 6kW electrical
20 input. And developments are going to 12kW
21 electrical input. These products indeed can
22 only be measured wire to air because they're

1 completely inseparable. So you cannot
2 separate the variable speed drive from the
3 motor and not from the fan.

4 So these products they have truly
5 wire to air ratio and there is no ambiguity
6 about influences that can happen in the field
7 if maybe an electrical filter is applied or
8 not applied or if the variable speed drive
9 settings are changed. If you change the PWM
10 frequency or something like you can do with a
11 standard drive, then you can change the
12 efficiency of the system, but these completely
13 integrated air movers would not have that
14 ambiguity. Thank you.

15 MR. FERNSTROM: So Gary Fernstrom
16 again. I totally understand the issues you
17 guys are raising with respect to large
18 equipment, where you couple a fan of some kind
19 and a motor and maybe a belt drive and
20 somebody puts a VSD on it and you don't make
21 it and it's not integrated. But when we talk
22 about this extended product category thing,

1 I'm talking about the smaller product that is
2 sold as a package and can be measured and
3 there ought not to be a big concern about
4 this.

5 MR. BROOKMAN: Yes, Dan.

6 MR. HARTLEIN: Dan Hartlein,
7 speaking on behalf of AMCA. Let's not forget
8 that we started the discussion with a product
9 range to begin at five horsepower. And as our
10 colleague from ebm-papst just represented,
11 he's at five kilowatts for his product range
12 at this point in time or maybe you said six,
13 I'm sorry.

14 MR. FERNSTROM: But that's an upper
15 limit though, but go ahead.

16 MR. HARTLEIN: No, that's the lower
17 limit and he's at six kilowatts with his
18 product range at the top. So there's a very,
19 very small amount of his product that would
20 even fall into the definition of this
21 discussion as to where we are today.

22 MR. FERNSTROM: Okay, so we opened

1 by saying we want a broader range than you do.
2 We want to go with what DOE's original
3 proposal was which includes a lot of this
4 smaller equipment that you all said was made
5 by small manufacturers and would represent a
6 significant burden on them to include this
7 product. And Andrew said we ought to take a
8 look at that. We ought to see how much of the
9 market energy use that comprises and whether
10 or not it makes sense to regulate that.

11 MR. BROOKMAN: Okay, final comments
12 on these comment boxes on 76. I'm not sure
13 we've touched on these, really. Maybe we
14 have.

15 MR. ROY: Doug, I have a comment.

16 MR. BROOKMAN: Yes, please.

17 MR. ROY: My name is Aniruddh Roy.
18 I just wanted to comment on Steve Rosenstock's
19 and Wade Smith's comments. There is an
20 existing standard, AHRI 1210. It's a
21 performance standard for variable frequency
22 drives. And there's a rating metric in that

1 standard drive system efficiency which is out
2 there.

3 We don't have a position on the
4 regulatory regime yet, but if DOE were to go
5 in the direction of fans inclusive of the
6 motor and VSDs, I guess AMCA 210 and the
7 standard come to mind in terms of the
8 consideration.

9 MR. BROOKMAN: Thank you. Louis.

10 MR. STARR: So I may have a
11 solution for some of the problems that we're
12 talking about. One thing, since the motors
13 are not clearly understood of how they perform
14 other than just full load performance in VFDs
15 as well, perhaps a factor could be entered for
16 those items that are applied equivalently
17 across the fans. And so really all then you
18 would be tested on is your fan application.
19 The rest could be calculated. If that could
20 be put in the context of the regimen of the
21 federal standards, then there wouldn't be a
22 problem. But I'm not sure that that can

1 happen. If it can happen, then that would be
2 a solution.

3 MR. BROOKMAN: Okay. Let's finish
4 with the engineering analysis.

5 MR. JASINSKI: Sure.

6 MR. BROOKMAN: And then we're going
7 to head to break here shortly.

8 MR. JASINSKI: So ultimately the
9 intermediate efficiency levels end at what DOE
10 calls the maximum technology and DOE is
11 required to analyze the maximum
12 technologically feasible efficiency levels.
13 So DOE will seek interested party input on the
14 appropriate max. tech. levels. This is
15 essentially asking what is the highest
16 achievable efficiency for fans in each of
17 these equipment classes.

18 MR. STEVENS: Doug, I just have got
19 to return to the last comment. I apologize.

20 MR. BROOKMAN: Sure.

21 MR. STEVENS: I wanted to reiterate
22 that AMCA has a task force, an international

1 task force that's working on the very things
2 we were talking about last and that they're
3 looking at an FEG metric, a measure wire to
4 gas metric for the type of fans that Armin was
5 discussing. And then for other products where
6 the permutations are very complex and there's
7 too many, that it's going to be an FEG metric
8 with estimates for losses to motors, drives,
9 et cetera added on top of that. I just wanted
10 to reiterate that. We understand that
11 complexity and we're working on it.

12 MR. BROOKMAN: Where are you in the
13 progression of that work?

14 MR. STEVENS: That's a good
15 question. The FEGs are complete. The wire to
16 gas testing is for the most part done.
17 There's some tweaks to AMCA 210 that have to
18 be made to close a gap, but that's not very
19 difficult to do so that's an ASHRAE process.
20 So we're a bit of a slave to that timing.

21 The third one, the measured part,
22 we've had two meetings already. The way

1 forward, the proposed way forward has been
2 agreed upon by the task force. They've been
3 tasked by the AMCA Board of Directors to
4 finish by May of this year. I think that's
5 pretty aggressive, but we think it ought to be
6 done this calendar year.

7 MR. BROOKMAN: Okay, good.

8 MR. JASINSKI: Any comments on the
9 maximum technology level?

10 MR. BROOKMAN: Yes, Dan.

11 MR. HARTLEIN: Just to reiterate a
12 comment, Dan Hartlein, Twin City Fan and AMCA.
13 To reiterate a comment I made earlier that the
14 industry is pretty mature and we've been
15 working towards efficient designs for years.
16 My colleague, Mr. Srejovic, talked about the
17 evolution of the plenum fan earlier and how
18 that actually led to a more efficient solution
19 for the user of the product, so I think we're
20 close there. And again, the concept of
21 getting the right fan size selected for the
22 right application is where we believe the

1 largest pickups are.

2 MR. BROOKMAN: Okay. Then let's
3 move on to outside regulatory changes.

4 MR. JASINSKI: So DOE will also
5 consider outside regulatory changes in its
6 analysis. This is essentially saying that DOE
7 will consider the effects of other DOE energy
8 conservation standards and any regulatory
9 changes outside of DOE's rulemaking process
10 that might impact manufacturers of this
11 equipment.

12 We also -- DOE also understands
13 that some regulatory changes can affect the
14 efficiency or energy consumption of fans
15 covered under this rulemaking so it will
16 account for that. And DOE will attempt to
17 identify any outside engineering issues that
18 might impact its analysis for the engineering
19 analysis.

20 MR. LLENZA: This is Charles
21 Llenza. That includes ASHRAE.

22 MR. BROOKMAN: So outside

1 regulatory changes that you anticipate? Dan.

2 MR. HARTLEIN: Dan Hartlein. Twin
3 City Fan and AMCA. I have a short story to
4 tell and I think it kind of demonstrates where
5 there might be some issues here. This is a
6 very recent story. It happened in the last
7 two weeks. We have a customer who is
8 operating a paper mill. He has a fan which is
9 operating within the range that we're
10 considering here, under the 500 kilowatt
11 range. We have a proposed solution to this
12 customer to cut the consumed power in half,
13 literally a little more than that in doing a
14 retrofit. That retrofit has been stopped
15 because of the potential or the interpretation
16 by the customer in their environmental side
17 that this could trigger new source standards
18 for the boiler that this fan is operating on.

19 I have now seen this twice.
20 Another one is a quarter of a million dollar
21 retrofit that's sitting in a South Carolina
22 power plant basement, has never been installed

1 for the exact same reason.

2 So I think there may be some
3 crossover between the Department of Energy
4 initiatives here and the EPA as it relates to
5 unleashing the potential for energy savings in
6 this area.

7 MR. BROOKMAN: Thank you. Rob.

8 MR. BOTELEER: I was just going to
9 make the comment one more time that we have a
10 motor rule that's in process that will expand
11 the scope of the product to cover pretty much
12 everything that we're talking about with fans.

13 MR. BROOKMAN: Okay, yes, Mike.

14 MR. IVANOVICH: Mike Inanovich,
15 AMCA. I didn't know exactly when to pop this
16 slide up, but is it possible I can bring up
17 this slide? Would you mind?

18 MR. JASINSKI: No.

19 MR. BROOKMAN: Why don't we do it
20 after the break.

21 MR. IVANOVICH: Okay.

22 MR. BROOKMAN: You haven't loaded

1 the slide yet, have you? Have you loaded it?
2 Okay, do it now. Pop it up. I thought you
3 had to load it.

4 (Pause.)

5 MR. IVANOVICH: There it is. So
6 this is a slide that we keep up to date. This
7 is a timeline of efficiency metrics moving
8 forward through codes and standards from 2012
9 to 2018, roughly. Right now, we're in that
10 2013 time frame where the 90.1 2013 version
11 has already been approved. It's going to be
12 published this year.

13 We've submitted in January 2013 a
14 code change proposal to the -- which would be
15 for the 2015 International Energy Conservation
16 Code. We're preparing a continuous
17 maintenance proposal for 189.1 which would be
18 submitted in 2013 towards the 2014 publication
19 of 189.1. We're working with IAPMO on their
20 green supplement which will have a language in
21 it that mirrors the 90.1 2013. It goes on and
22 on.

1 We're going to be working on
2 language changes for the 2016 International
3 Green Construction Code. And then the cycle
4 starts all over again with the 90.1 2016,
5 90.1, 2017, NIECC 2018, all of these things
6 will be happening during the DOE rulemaking
7 process. So we wanted to make DOE aware. And
8 AMCA is a leader in the development of these
9 change proposals. So I just wanted to make
10 DOE aware of all of these things that are
11 going on.

12 MR. BROOKMAN: Thank you. It's a
13 useful slide.

14 MR. LLENZA: This is Charles
15 Llenza. Thank you. This is the kind of
16 information that could be of great use to us.

17 MR. BROOKMAN: Steve, final comment
18 and then we're going to go to break.

19 MR. ROSENSTOCK: Steve Rosenstock.
20 Yes, I just add on, typically in between since
21 ASHRAE, I know, puts ones on continuous
22 maintenance, typically, they publish a

1 supplement in the midpoint between the three-
2 year cycle that updates the addendum as well.
3 So there's also the ASHRAE 2015 and a half
4 midterm supplement that also again -- it's a
5 supplement to the 2013 standard, but again for
6 those states that are interested, they can
7 always add that in there into their codes as
8 well.

9 MR. BROOKMAN: Michael.

10 MR. IVANOVICH: So I get to make
11 that slide more complex?

12 MR. ROSENSTOCK: Absolutely.

13 MR. BROOKMAN: Thank you. Let's
14 take a break.

15 MR. JASINSKI: Doug, I have one
16 more thing that's really important.

17 MR. BROOKMAN: Okay.

18 MR. JASINSKI: Just before we go,
19 when considering the technology options in the
20 efficiency levels, if there is an efficiency
21 level -- am I not on? Hello? If there's an
22 efficiency level that's only achievable using

1 a proprietary technology, DOE will exclude
2 that from its analysis. So if you're aware of
3 proprietary technologies and efficiency levels
4 that can only be achieved via that proprietary
5 technology, that's something that DOE -- if
6 you can make DOE aware of those proprietary
7 technologies, we would be appreciative.

8 MR. BROOKMAN: According to the
9 clock in this room, it's about eight minutes
10 after 3. Let's try ten minutes. That means
11 at 2:20, 3:20, we're going to resume. Go
12 quickly. We still have a lot of ground to
13 cover here. So we'll see you back here at
14 3:20.

15 (Whereupon, the above-entitled
16 matter went off the record at 3:08 p.m. and
17 resumed at 3:20 p.m.)

18 MR. BROOKMAN: Okay, we're now
19 going to proceed with markups analysis and
20 hear from Dave Winiarski.

21 MR. WINIARSKI: Hi, Dave Winiarski.
22 I'm from Pacific Northwest National Laboratory

1 and I've been asked to speak a little bit
2 about two portions of DOE's preliminary
3 analysis. These include the markups analysis
4 which is used to help develop end user prices
5 as well as DOE's energy use analysis.

6 I'll start with markups. So the
7 purpose of DOE's markup analysis is to
8 estimate actual final user prices based on the
9 manufacturers' selling prices as developed in
10 the engineering analysis for both equipment at
11 the baseline efficiency levels established, as
12 well as high efficiency equipment designs. It
13 basically involves two steps. The first step
14 is to identify the distribution channels for
15 equipment as it moves from the manufacturer to
16 the end user. And in that process, estimate
17 the share of products of each channel that
18 move or that pass through each separate
19 channel.

20 And then the next step is really to
21 estimate how within each channel the equipment
22 is marked up as it passes from say the

1 manufacturer to a distributor to some other
2 entity and finally to an end user.

3 This next slide, I want to discuss
4 some proposed distribution channels that DOE
5 has in the framework analysis and these are
6 really broken into maybe two major categories.
7 The categorization is not shown here, but the
8 first one is what I refer to is the original
9 equipment manufacturer channel, channel A,
10 where the manufacturer is building a fan and
11 he's selling that fan to another manufacturer
12 who is going to incorporate it in a final
13 product. And that final product is what's
14 actually sold.

15 When that second manufacturer, the
16 OEM, sells the product, he commonly will run
17 through his own product distribution chain
18 until it gets to the end user. In this first
19 OEM channel A, it's simplified. We just show
20 it as OEM product distributor, but there may
21 be actually some variations on that, depending
22 on what types of products are being sold.

1 Within the next large category is
2 what I call essentially the non-OEM
3 distribution of products where you're
4 essentially selling a fan that gets directly
5 to an end user and is not incorporated in
6 another product. So the different channels
7 that we identified here, channel B which may
8 be a very appropriate channel for many
9 commercial fans sold into the building
10 industry, the manufacturer would sell the fan
11 to a distributor. The distributor would take
12 possession of the fan physically. He would
13 then sell that to a contractor. The
14 contractor, like a mechanical contractor who
15 would then install the fan in a building,
16 potentially marking up the fan in that
17 process, as well as selling his labor for
18 installation.

19 The next, the third channel
20 identified there, distributor channel C, the
21 manufacturer does sell to a distributor, but
22 the user, the end user actually purchases

1 directly from a distributor. An example of
2 that might be a case where you have industrial
3 product where the industry may choose to
4 purchase directly from the distributor and
5 they're going to use their in-house labor to
6 incorporate it in their particular product or
7 particular industry.

8 Finally, we have direct-to-market
9 end user channel D here where the manufacturer
10 is essentially selling the fan directly to the
11 end user. That could be done, for instance,
12 in a case where you have a very large national
13 account where the end user is the national
14 account and they are purchasing the fans
15 directly from the manufacturer. Or perhaps in
16 a different scenario, the end user is
17 contacting a manufacturer's rep directly. The
18 manufacturer's rep then is helping out in
19 terms of specifying the fans. But the
20 physical fan actually is being sold directly
21 from the manufacturer and there is no entity
22 between the manufacturer and the end user that

1 takes possession and resells the fan or marks
2 the fan up.

3 Finally, we identified sort of what
4 I would consider maybe a catch-all channel
5 here which isn't accurately defined, but just
6 channel E, other distribution paths for the
7 products in this industry.

8 MR. BROOKMAN: So while this is
9 fresh, let's just jump straight to it. Are
10 these distribution channels, do they look
11 right to you?

12 Dan?

13 MR. HARTLEIN: Yes, I'll take it.
14 This is Dan Hartlein, Twin City Fan on behalf
15 of AMCA. In general, we accept those
16 distribution channels as representative. We
17 also -- differently. Every manufacturer has a
18 different approach to the market, so we would
19 suggest that you get that from your
20 manufacturing interviews.

21 MR. BROOKMAN: These are basic
22 channels, but there are variants.

1 MR. HARTLEIN: All of the above
2 exist.

3 MR. BROOKMAN: Yes, okay.

4 MR. HARTLEIN: All of the above
5 exist.

6 MR. BROOKMAN: Other comments?
7 Okay, thank you. Now let's move on.

8 MR. WINIARSKI: So within the
9 distribution chain, there's going to be
10 markups in the price of the product. The
11 markups analysis helps to develop sort of the
12 relationship between the manufacturer's
13 selling price and the final end user's
14 purchasing price. We actually do two types of
15 markups traditionally in the equipment and
16 appliance standards program. Those we refer
17 to as baseline markups. Baseline markups
18 reflect the relative overall incremental cost
19 or a factor, an incremental cost factor to go
20 from the selling price to the consumer price
21 for products at the current baseline
22 efficiency level.

1 And then incremental markups
2 actually look at the ratio of the price or the
3 price factor for going from an incremental
4 price increase at the manufacturer, the
5 manufacturer's selling price increase to a
6 final incremental price increase to the end
7 user. Those numbers are commonly thought of
8 as different. They are different because we
9 try to capture all of the expenses in that
10 distribution chain. Some of those expenses
11 will not scale with efficiency. For instance,
12 salaries in the distribution chain may not
13 necessarily scale with the cost of the product
14 that's sold. Commonly, things like rental and
15 occupancy don't necessarily scale, although
16 that might not be the case if we're looking at
17 larger fans. The total expenses for
18 warehousing might increase.

19 MR. BROOKMAN: To the comment box.
20 So we've already talked about 8-1. DOE
21 requests information about the functioning of
22 the manufacturer representatives and

1 distributors for the different classes and
2 different market segments that are covered in
3 this rule. Specifically also, DOE requests
4 information on the different OEM market
5 segments that manufacturers will sell into and
6 any information on the downstream distributor
7 channels.

8 MR. BROOKMAN: Dan?

9 MR. HARTLEIN: I'll take that one.

10 MR. BROOKMAN: 8-2, right?

11 MR. HARTLEIN: 8-2, Dan Hartlein,
12 Twin City Fan on behalf of AMCA. All markets
13 have quite considerable OEM channels. I'm
14 going to read you a quick list, just to kind
15 of give you a representation. It's not meant
16 to be exhaustive. We have manufacturers of
17 heat recovery units, desiccant
18 dehumidification and humidifiers, commercial
19 HVAC manufacturers, car wash manufacturers,
20 dust collector manufacturers, packaging
21 systems, vacuum systems, food processors,
22 dairy and cheese, restaurant hoods, fume

1 extraction, odor control laboratories,
2 petrochemical fire heaters, dryers for grain,
3 peanuts and other food products, paint spray
4 booths, oven manufacturers such as strip
5 annealers, cure ovens for paint, baking ovens,
6 et cetera, et cetera, et cetera. So it's
7 quite an exhaustive part of what we do.

8 MR. BROOKMAN: And just to be clear
9 because this is just so fundamental, you're
10 making the fan and the fan housing for those?

11 MR. HARTLEIN: We are making the
12 fan and often the fan housing, but again,
13 there's many unhoused fans in some of those
14 OEMs as well.

15 MR. BROOKMAN: Thank you. Go
16 ahead, Michael.

17 MR. IVANOVICH: I think part of the
18 point as well, a lot of those manufacturers
19 are making their own fans.

20 MR. BROOKMAN: Yes.

21 MR. HARTLEIN: That's true, very
22 good point.

1 MR. BROOKMAN: Good, good point.

2 8-3 has not yet been addressed.

3 MR. WINIARSKI: So DOE requests
4 comments on the application and market
5 segments identified by interested parties and
6 information on the market segments including
7 corresponding distributor channels and in
8 particular, if it's useful to us, trade
9 associations that might represent those
10 distributors.

11 MR. HARTLEIN: I'll take that one
12 again, Dan Hartlein, Twin City Fan, AMCA.
13 Yes, AMCA obviously is one of those and we're
14 proud to be part of that. I think we would
15 like to, in the interest of time, suggest that
16 we answer that in the written section.

17 MR. BROOKMAN: And help us with
18 these -- 8-4 through 8-6, Dave.

19 MR. WINIARSKI: So in 8-4, DOE
20 requests information on the proposed
21 distribution channels and the share of total
22 industry shipments that might be expected to

1 go through each distribution channel.

2 MR. BROOKMAN: Sounds like maybe
3 written comment on that?

4 MR. HARTLEIN: Yes, written comment
5 and also maybe question the legality of the
6 request. We're a little bit concerned that
7 we're getting into things that we can't share,
8 anti-trust issues here.

9 MR. LLENZA: The Department has --
10 Charles Llenza. The Department has a process
11 where you can provide us information that may
12 be confidential in nature from the industry's
13 point of view. And we will use the
14 information without disclosing it to the
15 public.

16 MR. HARTLEIN: Okay.

17 MR. WINIARSKI: In 8-5, this is
18 more of a catch-all, DOE seeks comment on
19 other sources of relevant data that the
20 industry or others feel is appropriate to
21 characterize the markups for commercial
22 industrial fans. In addition, 8-6, we'd like

1 folks to analyze its proposal to use the
2 incremental markup process for its life-cycle
3 cost analysis efforts.

4 MR. BROOKMAN: Okay, more written
5 comments there. Let's move on to energy use
6 analysis.

7 MR. WINIARSKI: So as part of the
8 analyses that feed into the DOE's life-cycle
9 cost and payback analysis, DOE must analyze
10 the energy use of the different classes of
11 commercial industrial fans, as well as how
12 that energy will change as we modify the
13 efficiency descriptor that's being selected.

14 DOE's process here, we typically
15 make estimates of the annual energy
16 consumption for baseline as well as higher
17 efficiency design. There's a lot of issues
18 involved in trying to make those estimates,
19 obviously. Some of these are that the end use
20 load profiles are expected to be extremely
21 variable across the different end uses and
22 applications.

1 Another one is that not all fans
2 will operate at their points of peak
3 efficiency in practice. We've got some
4 guidance here. We've heard earlier about
5 trying to get products working in that --
6 where there's 15 percent around there, best
7 efficiency point, but that may not be correct
8 for all applications and it may not be correct
9 for new versus maybe existing buildings, that
10 type of issue. So whatever information that
11 can be provided that's useful.

12 DOE's general approach in terms of
13 estimating annual energy consumption is to
14 develop some characterization of different
15 operating points for a given class of fan in a
16 given application; develop an estimate for the
17 energy consumption for that fan at that point,
18 actually the power consumption and multiply it
19 by the number of hours that are at that point
20 during the year, and then sum that all up. So
21 it's a pretty standard process.

22 Go ahead.

1 MR. IVANOVICH: Is it possible to
2 do plots on that? Graphs? Or is that just a
3 single number response equation?

4 MR. WINIARSKI: Which?

5 MR. IVANOVICH: The AEC. Do you
6 actually develop plot lines on that, graphs,
7 charts?

8 MR. WINIARSKI: Well, for the
9 annual energy consumption, we can. We can
10 develop numbers for each efficiency level or
11 some sort of plot that represents annual
12 energy consumption levels.

13 MR. BROOKMAN: Gary. Prior to
14 Gary, it was Michael. Now to Gary.

15 MR. FERNSTROM: Gary Fernstrom.
16 Yesterday in the pumps meeting, we talked
17 briefly about whether reactive power, the
18 related distribution losses and costs should
19 or should not be considered in the analysis.
20 I'd like to recommend for fans and blowers,
21 DOE similarly consider reactive power in
22 whatever manner is decided for the pumps rule-

1 making.

2 MR. BROOKMAN: Steve.

3 MR. ROSENSTOCK: Steve Rosenstock.

4 Yes, again, per yesterday, there is very

5 little missing is any sort of energy

6 consumption by the control system itself.

7 It's not in this equation. That needs to be

8 added under the extended appliance regime.

9 MR. WINIARSKI: If I can interrupt

10 --

11 MR. ROSENSTOCK: Sure.

12 MR. WINIARSKI: Actually, the

13 overall efficiency that's shown up there in

14 the equation is actually the product of

15 several different efficiencies including the

16 efficiency of the fan itself, the

17 transmission, the motor efficiency and any

18 control system such as a VSD that might be on

19 there.

20 MR. ROSENSTOCK: I see the control

21 system efficiency, but again, is that the

22 efficiency, but that efficiency -- again, I'm

1 trying to -- the equation is the efficiency in
2 terms of how that control systems affects the
3 fan energy usage.

4 MR. BROOKMAN: We're diving rather
5 deep late in the day.

6 MR. ROSENSTOCK: I'm sorry.

7 MR. BROOKMAN: I like this depth,
8 but we're not going to go there now. Thank
9 you.

10 Can you just consult with him and
11 find out?

12 MR. ROSENSTOCK: Yes, and the other
13 thing and getting back to the reactive power
14 issue is I think that in terms of that again,
15 I think there's -- if there's an issue where
16 the systems, again, extended power, it would
17 only be an issue is if the power factor of the
18 systems is less than typically I'll say 85
19 percent and for the most part it's higher. If
20 it's consistently less than 85 percent, then
21 it's an issue. If it's typically higher, than
22 it's not an issue. Thank you.

1 MR. FERNSTROM: So this is Gary. I
2 disagree. I think it's an issue regardless of
3 where you are in power factor because it does
4 affect losses and cost.

5 MR. BROOKMAN: And now going to the
6 comment box.

7 MR. WINIARSKI: There's a large
8 number of comments that are in the energy use
9 analysis. I'll go through relatively quickly
10 here.

11 One of them, the first one here, we
12 would like comment and input on
13 recommendations for identifying high sales
14 volume and large installed base market
15 segments. We've got some of that already for
16 specific industries that might have similar
17 load profiles because developing load profiles
18 may be difficult.

19 MR. BROOKMAN: So that's something
20 I presume you don't have much comment on
21 today.

22 MR. IVANOVICH: No, but we do have

1 a question.

2 MR. BROOKMAN: Yes.

3 MR. IVANOVICH: If you could clarify
4 what they mean by load profiles because it
5 might mean something different in the fan
6 industry.

7 MR. BROOKMAN: Dave.

8 MR. WINIARSKI: When I think of a
9 load profile, I think of how much. So it's
10 really maybe two different things. You have
11 sort of an operating load profile that you
12 might have in a building, how often a fan is
13 operated during the day. But you also include
14 at what points of operation you might have,
15 sort of pressure and volume for a given fan.
16 So both of those impact the load profiles that
17 we have to use in this type of analysis.

18 MR. BROOKMAN: Okay.

19 MR. WINIARSKI: And getting to that
20 point, we welcome any recommendations on
21 sources of data or analysis methods that would
22 help generate those different end user load

1 profiles for the different market segments.

2 DOE requests, 9-3, DOE requests
3 input on ways to characterize fan sizing and
4 selection practices. We've actually heard a
5 fair amount of that earlier today. But
6 anything that could be put in writing would be
7 useful. And in general, because we're looking
8 at range of sizes, we may be needing to
9 develop sort of normalized load profiles and
10 how those get normalized to a given fan size.

11 Finally, we recognize that there
12 are a large number, probably of uses, for
13 which data for developing load profiles may be
14 difficult and we certainly welcome any
15 information on what might be appropriate
16 generic-looking load profiles for given
17 industrial applications, for instance.

18 MR. BROOKMAN: Dan, do you have
19 something on this right now?

20 MR. HARTLEIN: Dan Hartlein, AMCA.
21 I am sitting here with quite a bit of
22 bewilderment to be honest. We have no idea

1 how to do that. So just to be clear. So we
2 would like to know how to do that as well. I
3 don't think we're a source of ideas or data
4 there.

5 MR. BROOKMAN: We appreciate you
6 saying that because it points to a gap
7 potentially, so that's good.

8 MR. HARTLEIN: We have no idea how
9 to do that.

10 MR. BROOKMAN: Okay, excellent.
11 We're moving on.

12 MR. WINIARSKI: So one of the
13 issues that's very important, I guess, in this
14 rule-making, is looking at the current
15 penetration level of variable frequency drives
16 in the different installed base of products.
17 That's going to become important regardless of
18 what metric DOE decides to go down with in
19 terms of establishing standards.

20 DOE requests comment and
21 recommendation on the range and number of
22 rotation speeds over which any analysis should

1 be carried out.

2 DOE requests information on current
3 industry practices and for the selection of
4 typical or representative operating points in
5 the field. We've heard a little bit about
6 that with regard to the range around the best
7 efficiency point, but there may be other
8 options that DOE needs to consider. And as
9 part of that how far in our analysis should we
10 be looking at around -- should we be extending
11 to a range of operating points around that
12 peak efficiency realm for the different
13 applications.

14 Going back to the equation that was
15 shown earlier, we talked about the values for
16 motor transmission and motor control or VFD
17 efficiencies. We certainly would like any
18 comments that could point to what might be
19 good mean values or representative values, for
20 instance, for different transmission
21 efficiencies that could be used in the energy
22 analysis.

1 MR. BROOKMAN: No response at this
2 time.

3 MR. WINIARSKI: And I think we move
4 on.

5 MR. BROOKMAN: Okay.

6 MS. IYAMA: Okay, so next, we'll
7 talk about the life-cycle cost and payback
8 period analysis. And I'll try to move quickly
9 on the next sections.

10 So the purpose of the life-cycle
11 cost and payback period analysis is to
12 determine the life-cycle cost and payback
13 period for the users of commercial industrial
14 fans. And the life-cycle cost is actually
15 composed of two components, the total
16 installed price and the lifetime operating
17 costs discounted to a particular base year.
18 The economic evaluation is done from the
19 consumer's perspective and results are
20 expressed in terms of LCC difference. That's
21 the difference between a baseline LCC and the
22 LCC at a particular standards case.

1 And we're also looking at payback
2 period which is total installed cost divided
3 by the change in the first year of operating
4 costs.

5 The approach for the LCC will be:
6 developing a fan selection model to reflect
7 product choices by customers. We'll develop a
8 baseline market efficiency distribution to
9 reflect the fact that some users are currently
10 already buying more efficient fans, even in
11 the absence of a standard. We'll be
12 developing efficiency distribution in the
13 standards case to reflect the expected
14 efficiency distribution for the compliance
15 year, the year where the standard will come
16 into force.

17 We'll be looking at annual energy
18 consumption, not just for one year, but over
19 the fan's lifetime and we'll be modeling
20 uncertainty and variability of the inputs
21 using a Monte Carlo simulation approach which
22 characterizes the inputs in terms of

1 probability distributions. And again, we'll
2 be looking at payback period.

3 Next, the few slides that I have go
4 through the inputs to the LCC that haven't
5 been discussed already in the engineering,
6 markups, and energy use analysis. So part of
7 the total installed cost, in addition to the
8 fan product price which is derived from the
9 outputs of the engineering and the markups,
10 we'll be looking at installation costs. For
11 the calculation of the operating costs, we'll
12 be looking at energy prices. For price
13 trends, for energy price trends, we'll be
14 looking at the EIA's annual energy outlook.
15 For the operating costs, we'll be also looking
16 at maintenance and repair costs and not only
17 costs, but also any impacts on the efficiency
18 of the product for the fan along its lifetime.

19 Another important input to the LCC
20 is, of course, the equipment lifetime and in
21 the framework we provide some preliminary
22 information that we've collected. Fan

1 lifetime between 10 and 25 years with an
2 average estimate of 15 years.

3 Discount rates will be applied to
4 convert the values of money into present value
5 and again, we'll be looking at efficiency
6 distributions to characterize the current
7 efficiency range of products in the base case
8 and in the standards case.

9 And if no market efficiency data is
10 available, DOE may look at available models in
11 catalog data.

12 We've reached the comment boxes.
13 DOE welcomes comment on the factors that
14 impact the installation costs for fans and on
15 whether installation cost increases with
16 higher-efficiency equipment.

17 DOE welcomes input on the proposed
18 methodology for estimating current and future
19 electricity prices.

20 DOE invites comment on how repair
21 costs may change for more efficient fans. DOE
22 also invites comment on repair practices and

1 how usage patterns may impact equipment repair
2 and maintenance.

3 DOE welcomes information that will
4 assist in determining an appropriate
5 distribution of fan lifetimes for the
6 equipment classes covered in this rule-making.

7 DOE welcomes input on the proposed
8 approaches for estimating discount rates for
9 fan users.

10 And DOE requests data on the
11 efficiency distributions and welcomes comments
12 on the likelihood and degree of improvement in
13 efficiency of commercial industrial fans in
14 the next five to ten years as a result of
15 market forces or industry trends.

16 MR. BROOKMAN: Let's start with 10-
17 1. What do you anticipate will happen, what
18 will happen with the installation costs on
19 fans? Will, for example, there be
20 installation cost increases with higher
21 efficiency equipment?

22 Yes, Mark?

1 MR. BUBLITZ: Mark Bublitz, New
2 York Blower Company representing AMCA.

3 If the end user gets a more
4 efficient product that would usually result in
5 a larger fan running at slower speed. So you
6 would consume more space. It would be heavier
7 if it was up off the ground.

8 MR. BROOKMAN: I see. It's not the
9 fan itself.

10 MR. BUBLITZ: If you could make a
11 fan a couple points more efficient, aside from
12 the expense that went into product
13 development.

14 MR. BROOKMAN: Okay, the
15 installation costs, okay, got you. We got it.
16 Other comments on this one? I'm about to move
17 on to electricity prices.

18 Steve, you always comment on
19 electricity prices, understandably.

20 MR. ROSENSTOCK: No comment at this
21 point.

22 (Laughter.)

1 MR. BROOKMAN: For the record, the
2 facilitator is picking himself up off the
3 floor.

4 (Laughter.)

5 MR. ROSENSTOCK: This is Steve. I
6 hope the facilitator didn't hurt himself.

7 (Laughter.)

8 MR. BROOKMAN: Okay. Please,
9 Michael.

10 MR. IVANOVICH: Regarding the model
11 itself, again, AMCA really wants to emphasize
12 the importance of product selection, sizing.
13 Would the model be sophisticated enough to
14 respond to the fact that a higher efficiency
15 could increase costs and lead to a smaller
16 size selection which would increase energy
17 consumption?

18 MS. IYAMA: We'll try to take that
19 suggestion into account.

20 MR. IVANOVICH: Thank you.

21 MR. BROOKMAN: Okay, now I'm
22 looking at 10-3. How repair costs may change

1 for more efficient fans and also the issue of
2 repair and maintenance for more efficient
3 fans. Can you forecast how that might go?
4 Mark?

5 MR. BUBLITZ: Mark Bublitz, New
6 York Blower Company on behalf of AMCA. We
7 don't anticipate the repair costs would be
8 impacted.

9 MR. BROOKMAN: And maintenance?

10 MR. BUBLITZ: No.

11 MR. BROOKMAN: No? Okay. 10-4,
12 appropriate distribution of fan lifetimes for
13 the equipment classes covered in the rule-
14 making. Do you have -- nothing on that at
15 this time.

16 Discount rates for fan users. Do
17 you anticipate that would be changing? Yes,
18 okay.

19 MR. BUBLITZ: That's an economic
20 analysis. I don't think a fan user would
21 exist in that world.

22 (Laughter.)

1 The question is one company has a
2 different discount rate than another. I think
3 that's kind of a financial marketing analysis
4 and it would just be a function of the market,
5 financial market.

6 MR. BROOKMAN: I'm going to 10-6
7 just to be complete here. On the likelihood
8 and degree of improvement, in efficiency of
9 commercial and industrial fans in the next
10 five to ten years as a result of market forces
11 or industry trends.

12 Yes, Michael.

13 MR. IVANOVICH: Yes, as I showed on
14 that slide earlier, the trendline is that fan
15 efficiency requirements in minimum codes and
16 standards for energy efficiency and green
17 construction are certainly evolving quickly
18 during this time period. And this is a
19 catalyzing effort to engage the market and a
20 lot of marketing communications about fan
21 efficiency and the importance of it. So I
22 really think that the efforts that AMCA and

1 the industry are pursuing right now on codes
2 and standards is going to affect this
3 trendline very much.

4 MR. BROOKMAN: Steve Rosenstock.

5 MR. ROSENSTOCK: Steve Rosenstock.

6 Yes, to follow on that as well, I have noticed
7 that in certain jurisdictions that minimum
8 codes are being replaced by green building
9 codes. For example, in D.C., if you're over
10 50,000 square feet, you have meet LEED, you
11 have to be certified LEED to get a certificate
12 of occupancy. And LEED requires higher energy
13 efficiency significantly above ASHRAE 90.1 and
14 does give credit for other high efficiency
15 technologies. So that is also -- and there
16 are other areas of the country where we're
17 noticing that trend as well, so that's also
18 going to have a push on all technologies.

19 MR. BROOKMAN: Thank you.

20 MR. HARTLEIN: Just a side comment,
21 Dan Hartlein, Twin City Fan and AMCA, as well.
22 The FEG program does address the need to

1 select a fan closer to peak efficiency. So
2 that in itself as it's adopted should drive
3 solution or a major solution to what is the
4 biggest problem we have in energy consumption
5 in this industry.

6 MR. BROOKMAN: Tim? Pardon me,
7 Michael.

8 MR. IVANOVICH: Mike Ivanovich.
9 One of the indicators now is that AMCA started
10 its certification program for fan efficiency
11 grades around 2010. The uptake on that was
12 kind of slow primarily because the original
13 requirement in codes and standards involving
14 fan efficiency grades, but now that those are
15 on the horizon, the rate at which that's been
16 increasing has been significant. There are
17 now, I believe, 35 manufacturers that have fan
18 efficiency grades certified by AMCA and over
19 264 fan models, certified fans.

20 MR. BROOKMAN: So there are some
21 significant trends in the market and industry.
22 Okay, good.

1 So in addition to amplifying those
2 in your written comments, and you've already
3 started that with all -- okay. We're moving
4 on.

5 MS. IYAMA: Thank you. So next
6 I'll talk about the shipments analysis which
7 is an input to the national impact analysis.

8 The purpose of the shipments
9 analysis is to project future shipments by
10 equipment class over a period of 30 years
11 beginning at the expected compliance year of
12 the standard. DOE may characterize the
13 projected production of fans using economic
14 indicators such as private fixed investment
15 data for equipment incorporating fans. And
16 DOE may use different shipment projections in
17 the standards case as compared to the base
18 case. And that would be to reflect the impact
19 of increased equipment costs and reduced
20 operating costs on shipments.

21 And the comment box on the
22 shipments analysis. DOE welcomes comment on

1 the shipments projection methodology. DOE
2 invites comments regarding the selection of
3 appropriate economic drivers and sources of
4 data for historical shipments and shipments
5 breakdowns by equipment class.

6 DOE requests historical shipments
7 data for each of the considered equipment
8 classes.

9 And DOE welcomes comment on how an
10 energy conservation standard for fans might
11 impact shipments of the equipment covered in
12 this rule-making.

13 MR. BROOKMAN: Michael?

14 MR. IVANOVICH: Yes, basically we'd
15 just like to refer DOE for our answers for 5-1
16 and 5-2.

17 MR. BROOKMAN: Okay. And national
18 impact analysis.

19 MS. IYAMA: The purpose of the
20 national impact analysis is to determine the
21 national energy savings and the national
22 consumer economic impacts under different

1 standard levels. And in order to do so we'll
2 be developing annual values of, annual time
3 series of values over 30 years of shipments
4 starting at the compliance year and we'll do
5 this for the national energy savings and the
6 national consumer economic impacts.

7 We'll be using the shipments model
8 to estimate the stock of affected products by
9 the standard each year. We'll be using the
10 LCC outputs to develop total installed cost
11 and energy use data each year. And we'll be
12 aggregating costs and energy use over that 30-
13 year shipments and 30-year analysis period.

14 For the calculation of the national
15 energy savings, we'll be looking at, each
16 year, the difference in energy use between the
17 base case and the standards case. And we'll
18 be taking the cumulative savings over the
19 period. That provides the national energy
20 savings expressed in primary and full fuel
21 cycle savings.

22 For the NPV, we'll be calculating

1 the difference, each year, in operating costs
2 and the difference, each year, in total
3 installed costs between a base case situation
4 and a standards case situation. We'll convert
5 that into present value using discount rates
6 over 30 years and take the difference to get
7 to the national consumer NPV, net present
8 value.

9 And there's no comment boxes for
10 this section. So let's continue with the
11 preliminary manufacturer impact analysis.

12 MR. JASINSKI: Thanks, Sam Jasinski
13 from Navigant Consulting again. As I
14 mentioned earlier, DOE also conducts a
15 manufacturer impact analysis. The activities
16 for the manufacturer impact analysis are
17 greatly expanded in the NOPR phase, but DOE
18 does take advantage of the preliminary
19 analysis by conducting a preliminary
20 manufacturer impact analysis. The primary
21 purpose of this analysis is to assess the
22 potential impacts of energy conservation

1 standards on the manufacturers of fans.

2 The method that DOE uses is to
3 conduct interviews with manufacturers. During
4 these interviews, for the preliminary
5 manufacturer impact analysis a lot of the
6 discussion is focused on the engineering side
7 of things, but it is also used to identify
8 major issues and the potential outcomes. At
9 the end, DOE will collate the interview
10 responses and prepare a summary of these major
11 issues and outcomes and start to conduct a
12 strawman industry cash-flow analysis based
13 somewhat on interview responses, but also on
14 publicly available financial information,
15 primarily from SEC 10Ks and things of that
16 nature.

17 Some of the major goals of the
18 preliminary manufacturer impact analysis are
19 identify manufacturer subgroups. These are
20 any subgroups that might be disproportionately
21 affected by the efficiency standards and one
22 default subgroup that is always -- the DOE is

1 always concerned with is identifying small
2 businesses and conducting a Regulatory
3 Flexibility Act analysis to determine the
4 impacts of the standards on the small
5 manufacturers.

6 Secondly, the cumulative regulatory
7 burden which we touched on earlier also about
8 identifying and considering the impact of
9 multiple product specific regulations on the
10 manufacturers, whether they be part of the DOE
11 Defined Standard Program or outside
12 regulations as well.

13 So at this time DOE requests
14 comments on identifying subgroups for fan
15 equipment manufacturers that we should
16 consider in the analysis.

17 MR. BROOKMAN: Yes, Aniruddh.

18 MR. ROY: My name is Aniruddh Roy,
19 AHRI. I just have a few comments on the
20 cumulative regulatory burden just as examples.
21 For example, let's say there's a furnace
22 manufacturer that manufactures its own fan.

1 The fan is installed and obviously the furnace
2 which is a regulated product as well as maybe
3 other unregulated products, that manufacturer
4 would be subject to rule-makings that include
5 the FER metric which is coming up on
6 residential furnaces, the existing AFUE and
7 the standby and off-mode requirements that
8 will be in place shortly, as well as potential
9 regulation on the fan from this rule-making.

10 Another example is package systems
11 where you have the 63-ton units that are above
12 that limit. They're unregulated. And so they
13 would need to meet the fan efficiency
14 requirements per this rule-making, but would
15 be subject to the DOE energy conservation
16 standards below 63 tons. Although the product
17 itself, the package system itself is
18 essentially the same, it's just a higher
19 tonnage.

20 Another example is residential A/Cs
21 and commercial package A/Cs. Again, the
22 principle, the design and spirit might be the

1 same, but you have to meet the SR and the EER
2 requirements on the energy conservation
3 standards depending on the product size. And
4 then on top of that, if this fan which is used
5 in this package product goes into another
6 unregulated product, then you have to be
7 subject to another fan efficiency requirement
8 per this rule-making. So we would encourage
9 DOE to keep that in consideration.

10 Coming back to our opening remarks
11 on the ASHRAE 90.1 standard and keep this in
12 mind during this aspect of the rule-making.

13 MR. BROOKMAN: Okay, thank you.
14 Yes, Michael.

15 MR. IVANOVICH: This kind of
16 combines 14-1 and -2. And then Dan may want
17 to weigh in after me.

18 But basically, we'd just like to
19 emphasize again that 87 percent of AMCA
20 members are small businesses or 80 percent.
21 And in our perspective, we're going to be
22 going underneath the regulatory change already

1 with codes and standards, as I showed on that
2 timeline. That not only represents changes,
3 potential changes in tooling and things of
4 that nature, but also the investments that
5 they're having to make in sizing, selection,
6 software changes, literature changes that are
7 printed in electronic catalogs, websites,
8 training their reps, training their customers,
9 we're undergoing a sea change in the fan
10 efficiency industry right now. That is going
11 to be cumulative over time and potential
12 changes that DOE would implement on that could
13 be especially burdensome in that regard.

14 So to invest all of these things
15 over that long of a timeline and then have to
16 reinvest again could be considerable.

17 MR. BROOKMAN: Okay, thank you.
18 Dan.

19 MR. HARTLEIN: Dan Hartlein, Twin
20 City Fan and AMCA. Just a small comment, back
21 to reiterate the small business participation
22 in our industry, you mentioned SEC 10K

1 filings. I'm not sure there are any. I'm
2 trying to think of a publicly-held company
3 that's in our space and I'm not coming up with
4 a single one. So I don't think you'll find
5 that data. So you're going to have to get
6 that in the manufacturers' interviews.

7 MR. BROOKMAN: Okay, thank you.
8 Helpful. I'm scanning through 14-1, 14-2, and
9 14-A and I think we've kind of addressed all
10 of them, but I'll give you another chance to
11 look and make sure we have. Any question or
12 comment?

13 Your name, please?

14 MR. LAU: This is Chris Lau from
15 Navigant. This question is directed to AMCA.
16 Several times now you've referred to your
17 membership as 80 percent small businesses.
18 And sometimes you referred to them, you've
19 been citing revenue numbers. The definition
20 we'll be using in our analysis is based off
21 the SBA definition of small business and so
22 it's got an employee threshold. I think your

1 members fall under that. I just wanted to
2 confirm though. Thank you.

3 MR. BROOKMAN: Okay, thank you.

4 MR. JASINSKI: I'll hand it back to
5 Sanaee. Thank you.

6 MR. BROOKMAN: So these are the
7 beginning of NOPR analyses and these are
8 downstream a fair bit. So we're going to go
9 through these rather rapidly.

10 MS. IYAMA: So the NOPR starts with
11 a revision of the preliminary analysis
12 chapters that we've discussed and then there
13 are the new chapters, downstream analysis,
14 starting with the customer subgroup analysis.

15 The customer subgroup is basically
16 an LCC, but targeted towards a specific subset
17 of user population which could be
18 disproportionately impacted by standard. And
19 so the method used is to expand the LCC
20 analysis to examine the impacts for that
21 specific subgroup. And in order to do this,
22 we use inputs specific to each of the

1 considered consumer subgroups in the LCC.

2 Comment box, DOE welcomes comment
3 on what, if any --

4 MR. BROOKMAN: You can skip the
5 comments.

6 MR. STEVENS: Well, I'm sorry, we
7 talked about cross flow fans and air curtains
8 earlier today and they are a particular
9 consumer group that can be adversely affected.

10 MR. BROOKMAN: Thank you. Thanks
11 for getting that in there. Okay. Other
12 comments? I don't want to foreclose anything.

13 MS. IYAMA: Next we'll talk about
14 the utility impact analysis. The purpose is
15 to assess the overall impacts on domestic
16 energy suppliers that would result from the
17 imposition of standards.

18 The typical method that DOE uses is
19 to use NEMS-BT, a modified version of the NEMS
20 model which is the model used to develop the
21 Annual Energy Outlook projections that you see
22 in DOE/EIA reports.

1 Outputs are expressed in terms of
2 electricity sales, price, and avoided capacity
3 resulting from potential standards.

4 MR. BROOKMAN: Steve Rosenstock.

5 MR. ROSENSTOCK: Steve Rosenstock,
6 EEI. In terms of this, especially in terms of
7 -- it says avoided capacity and that's really
8 the peak power usage of the equipment and also
9 yesterday with the pumps, not necessarily
10 annual energy consumption. The peak demand is
11 really the driver for new capacity typically.

12 And the issue here is again not to
13 -- is under the extended regime, we're talking
14 about variable speed drives and all the other
15 controls is they're variable and in terms of
16 the application, in terms of -- they'll save
17 energy, but under peak load condition they
18 don't save energy. In fact, depending on the
19 energy usage of that control or the drive at a
20 peak loading condition it can actually equal
21 or actually slightly increase peak demand by
22 the fan system, I'll say for lack of better

1 words. I just don't want to just isolate
2 things.

3 So I hope the analysis can take
4 that into account because you're talking about
5 equipment with variable savings and variable
6 impacts on the actual usage of the system, the
7 actual impact on any sort of avoided capacity
8 will be highly variable. Thank you.

9 MR. BROOKMAN: Thank you. No
10 additional comments.

11 MS. IYAMA: Next I'll go over the
12 employment impact analysis. So in the MIA we
13 discussed direct employment impacts and in
14 this section the purpose is to assess the
15 indirect employment impacts which could result
16 from shifting consumer expenditures. In order
17 to evaluate those impacts, DOE intends to use
18 the ImSET model.

19 MR. BROOKMAN: Comments on
20 employment impact analysis? Okay.

21 MS. IYAMA: Next, emissions
22 analysis. The purpose is to estimate

1 environmental impacts from potential energy
2 conservation standards for fans including
3 changes in Full Fuel Cycle emissions. So
4 basically here, we'll take the outputs of the
5 national energy savings and convert those into
6 emissions savings.

7 DOE is also going to monetize those
8 emissions savings using social cost of carbon
9 values developed outside of DOE which are
10 represented here and DOE will also estimate
11 the potential monetary benefits of reduced NOx
12 emissions.

13 MR. LLENZA: Just a comment from
14 Charles Llenza, Department of Energy here.
15 Those numbers usually come from the group of
16 government entities that regulate emissions,
17 EPA is one of them. And it's a number that
18 we're handed to for our analysis.

19 MR. BROOKMAN: Steve Rosenstock.

20 MR. ROSENSTOCK: Steve Rosenstock,
21 EEI. Sorry, for those of you who were in the
22 room yesterday, I'm going to repeat myself.

1 Since we're talking about over the next seven
2 years, many of the emissions shown here will
3 have caps and for many of these emissions,
4 emissions have been going on significantly
5 over the last 10, 20, or 30 years from the
6 electric power sector.

7 And right now, there's regional
8 caps on certain emissions, especially CO2 and
9 I hope that DOE does take and I'll write this
10 in the comments, but you know, I hope that
11 wherever there's a cap or future cap that DOE
12 takes it into their -- accounts for it in
13 their analysis like they've done correctly
14 with SO2 and nitrogen oxides. Thank you.

15 MR. BROOKMAN: Okay, thank you.
16 Additional -- yes.

17 MR. IVANOVICH: Just one quick
18 comment. I know that EPA has just published
19 new rules, rule-makings on emissions for
20 commercial and industrial boilers and power
21 plants. What is the time frame for their
22 emissions reductions associated with that that

1 might factor into the 30-year DOE analysis?

2 MR. ROSENSTOCK: Steve Rosenstock,
3 EEI. For the commercial/industrial boilers,
4 the large ones, there's two types, major
5 source and area source, I believe that both of
6 those regulations, I believe that for those
7 final rules they go in effect within two
8 years, so I would say -- I'll say 2015 at the
9 latest. And for the largest ones, it might be
10 even sooner. I think it's -- I would say
11 within two years, effective date.

12 MR. IVANOVICH: I think that's
13 pretty significant. Thank you.

14 MR. BROOKMAN: Other comments on
15 emissions analysis? Okay.

16 MS. IYAMA: So the last section of
17 the NOPR is the regulatory impact analysis.
18 In this section DOE will explore the potential
19 for non-regulatory alternatives to new
20 efficiency standards. And this assessment
21 will be based on actual impacts of any such
22 initiatives to date and also will consider

1 information presented regarding the impacts
2 that any existing initiative might have in the
3 future.

4 And with this --

5 MR. BROOKMAN: Comments on the
6 regulatory impact analysis?

7 So as we had promised this morning
8 now is another opportunity for anybody who
9 wishes to make final remarks, raise additional
10 issues that were not covered sufficiently
11 during the day today for anybody that wishes
12 to.

13 Michael?

14 MR. IVANOVICH: On behalf of AMCA
15 International and its members, I would just
16 like to say thank you very much Department of
17 Energy for this opportunity to share our
18 analysis and framework document and to make
19 our first experience working with DOE in this
20 collaborative fashion, what we perceive to be
21 very, very positive. So thank you very much.

22 MR. BROOKMAN: Thank you. Other

1 comments here as we move towards closure?

2 One housekeeping item.

3 MR. LLENZA: There's two.

4 MR. BROOKMAN: Do you want to do
5 this?

6 MR. LLENZA: I'll do this.

7 MR. BROOKMAN: And from my
8 perspective, I'll turn it back to Charles
9 Llenza. Thanks to all of you. This was a
10 very, very effective meeting today. We
11 covered a lot of ground and very effective
12 input by all of you. So many thanks and safe
13 travels.

14 MR. LLENZA: Okay, I have a little
15 housekeeping item on the questions that we had
16 submitted. I just wanted to make a general
17 comment. I think we have to apologize. We
18 didn't do such a great job of matching up the
19 questions from the framework to the actual
20 presentation. So as baseline, let's use the
21 questions in the framework document because
22 that's what we published. That's online.

1 Those are the correct questions.

2 We're going to update the
3 presentation with the correct questions just
4 to keep our paperwork in order and for future
5 people that might refer to the presentation.
6 They all match up.

7 So let's use the framework, it's
8 page 66 through 71 of the framework, I'm
9 sorry, 72 of the framework document. Those
10 are the correct questions to use and when you
11 see a C on the number of the question, that
12 just means that's a subset of that question,
13 so you could just refer to that subset C dash
14 a number dash a number subset A, B, C or D,
15 whatever it is. Usually, we give it a number.
16 If we have a subset, we add another -- we add
17 the alphabet number to the side just to
18 identify the question.

19 Again, how to submit comments here.
20 Please make sure you have the docket number or
21 the RIN number on the submittal and you can
22 see from the slide where to submit and how to

1 submit. The comment period ends May 2, 2013.

2 On the ASRAC meeting this next
3 week, there was a little bit of confusion
4 about a webinar, not a webinar. I have from
5 my boss, it's being set up. We have your
6 business cards. I've given the staff your
7 business cards, emails, and we should send out
8 an email invite to all parties that attended
9 today's meeting and yesterday's pumps
10 framework meeting as to if they wanted to
11 attend via webinar the ASRAC meeting.
12 You're also welcome to attend in person.

13 Sure, go ahead.

14 PARTICIPANT: Is attendance on the
15 webinar limited?

16 MR. LLENZA: As far as I know there
17 is no limit.

18 PARTICIPANT: So we can pass the
19 information along to other people?

20 MR. LLENZA: Oh, yes. More than
21 welcome to -- part of our reason of providing
22 webinars is not everybody can travel, but the

1 other thing is we do have limitations if
2 everybody showed up in some of these rooms.
3 So hopefully that won't be the case on the
4 actual webinar website. But we've never hit a
5 ceiling. Let's put it that way.

6 And then my closing remark is thank
7 you for attending and bearing with this
8 process. I know it's tedious because I'm
9 tired and I'm sure that many here are tired.
10 But we are looking forward to working with
11 everybody that's attended today, people at the
12 webinar and other parties that couldn't
13 attend, to have a good rule-making in terms of
14 fans and blowers here at the Department of
15 Energy. Thanks again for attending. That's
16 it.

17 (Whereupon, at 4:13 p.m., the
18 public meeting was concluded.)
19
20
21
22

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This is to certify that the foregoing transcript

In the matter of: Energy Conservation Standards for
Commercial/Industrial Fans & Blowers

Before: US DOE

Date: 02-21-13

Place: Washington, DC

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