

**Date:** May 7, 2015

**Case:** ASRAC Fans and Blowers Working Group Meeting



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U.S. DEPARTMENT OF ENERGY PUBLIC MEETING  
ASRAC FANS AND BLOWERS WORKING GROUP MEETING

U.S. Department of Energy  
Forrestal Building, Room 6E-066  
1000 Independence Avenue, SW  
Washington, DC 20585

9:00 a.m.

Thursday, May 7, 2015

1 Appearances for Department of Energy Meeting

2

3 Ashley Armstrong, DOE

4 Wade Boswell, DOE

5 Stephen Fine, DOE

6 Pam Pontillo, DOE

7 Pete Cochran, DOE

8 Janet Freimoth, DOE

9 Brooke DuBois, DOE

10 Rob Boteler, Nidec Motor Corporation

11 Paul Lindahl, SPX

12 Larry Burdick, SPX

13 Mark Bublitz, The New York Blower Company

14 Tom Catania, Erb Institute

15 E. Duane Daddis, United Technologies

16 Steve Dikeman, Acoustiflo

17 Daniel E. Delaney, Regal Beloit America, Inc.

18 Mark W. Fly, Aeon Heating & Cooling Products

19 Dan Hartlein, Twin City Fan Companies, Ltd.

20 David A. Johnson, Berner International Corporation

21 Joanna Mauer, Appliance Standards Awareness Project

22 (ASAP)

- 1 Frank T. Morrison, Baltimore Aircoil Company
- 2 Laura G. Petrillo-Groh, Air-Conditioning, Heating, &
- 3 Refrigeration Institute (AHRI)
- 4 Aniruddh Roy, Goodman Manufacturing
- 5 Geoff Sheard, AGS Consulting, LLC
- 6 William Smiley, Smiley Engineering LLC
- 7 Meg Waltner, Natural Resources Defense Council (NRDC)
- 8 Chris Wiseman, Nidec
- 9 Michael L. Wolf, Greenheck
- 10 Gary Fernstrom, CA IOU's
- 11 Sam Jasinski, Navigant
- 12 Donald A. McNeil, Buffalo Air Handling
- 13 Stephen R. Wiggins, Newcomb & Boyd
- 14 Sanaee Iyama, Lawrence Berkeley National Laboratory
- 15
- 16
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1 P R O C E E D I N G

2 MR. BOSWELL: I'm sure you are all aware  
3 that we are scheduled to start at 9. One group  
4 requested that they have a chance to caucus amongst  
5 themselves this morning. They are saying that  
6 will take them about maybe 20 minutes, so we probably  
7 won't get started formally for 15-20 minutes is my  
8 guess. If you want to use that time or if there are  
9 other people that want to spend that time kind of  
10 conversing, I just wanted to make sure that you knew  
11 that we would have a slightly delayed start. Thank  
12 you.

13 MR. BOSWELL: Okay do we have everyone  
14 here? It looks like we are assembled.

15 MS. ARMSTRONG: Did you put the new slides  
16 in?

17 MR. BOSWELL: Okay so we are about  
18 commence the second day of the working group for the  
19 record. If we could just very quickly go around and  
20 state your name and your company so we have that on  
21 the record and then we will move into where we left  
22 off yesterday.

1 MR. SHEARD: Geoff Sheard, AGS Consulting.

2 MS. PETRILLO-GROH: Laura Petrillo-Groh,  
3 Air-Conditioning, Heating and Refrigeration  
4 Institute.

5 MR. FERSTROM: Gary Ferstrom for the  
6 California Investor Owned Utilities Pacific Gas and  
7 Electric, Southern California Edison San Diego Gas  
8 and Electric and the Southern California Gas Company.

9 MR. SMILEY: Bill Smiley, Trane Company,  
10 part of Ingersoll Rand.

11 MR. SMITH: Wade Smith with Air Movement  
12 and Control Association.

13 MR. DIKEMAN: Steve Dikeman with  
14 AcoustiFLO.

15 MR. GOODMAN: Aniruddh Roy, Goodman.

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

18 MR. WIGGINS: Steve Wiggins, Newcomb &  
19 Boyd.

20 MR. WOLF: Mike Wolf, Greenheck.

21 MS. MAUER: Joanna Mauer, Appliance  
22 Standards Awareness Project.

1 MR. FLY: Mark Fly, AAON Incorporated.

2 MR. BUBLITZ: Mark Bublitz, the New York  
3 Blower Company.

4 MR. BURDICK: Larry Burdick, SPX.

5 MR. DADDIS, Duane Daddis, Carrier.

6 MR. HARTLEIN: Dan Hartlein, Twin City  
7 Fan.

8 MR. MCNEIL: Don McNeil, Buffalo Air  
9 Handling.

10 MR. JASINSKI: Sam Jasinski, Navigant  
11 Consulting.

12 MS. ARMSTRONG: Ashley Armstrong, DOE.

13 MS. LYAMA: Sanaae Iyama, Lawrence  
14 Berkeley National Lab.

15 MR. FINE: Steve Fine, Office of Hearings  
16 and Appeals.

17 MR. BOSWELL: Wade Boswell, Office of  
18 Hearings and Appeals and Facilitator.

19 MS. PONTILLO: Pam Pontillo, Department of  
20 Energy Facilitator.

21 MR. HAUER: Armin Hauer, ebm-papst,  
22 Incorporated.

1 MR. HOWE: Nick Howe, Carnes Company.

2 MR. JOHNSON: David Johnson, Berner  
3 International Corporation.

4 MR. WAGNER: Greg Wagner, Morrison  
5 Products.

6 MR. COCHRAN: Pete Cochran, DOE.

7 MR. BOTELER: Rob Boteler, NIDEC.

8 MR. WISEMAN: Chris Wiseman, NIDEC.

9 MR. DELANEY: Dan Delaney, Regal Beloit.

10 MR. CATANIA: Tom Catania, Consultant to  
11 AMCA and University of Michigan.

12 MS. FREIMUTH: Janet Freimuth, Department  
13 of Energy, Office of Hearings and Appeals.

14 MS. DEBOIS: Brooke Debois, Department of  
15 Energy, Office of Hearings and Appeals.

16 MR. LINDAHL: Paul Lindahl, SPX Marley  
17 Cooling Towers.

18 MR. MORRISON: Frank Morrison, Baltimore  
19 Aircoil Company and alternate for the Cooling Tower  
20 Institute.

21 MR. PERSFUL: Trinity Persful, Clarage Fan  
22 Company.



1 MR. BOSWELL: Okay and I understand that  
2 we have two working group members who are also ASRAC  
3 reps that are on the webinar with open mics so I  
4 would just ask first Diane to introduce herself and  
5 then Deborah.

6 MS. JAKOBS: This is Diane Jakobs from  
7 Rheem.

8 MR. BOSWELL: Is Deborah still on the web?

9 MS. MILLER: Yes I am, Deborah Miller  
10 representing NASEO can you hear me?

11 MR. BOSWELL: Yes okay.

12 MS. MILLER: Thank you very much.

13 MR. BOSWELL: Thank you. Okay, so I think  
14 where we are is picking up the discussion -- actually  
15 to Laura I see your card raised is there something?

16 MS. PETRILLO GROH: Yeah hi, thank you for  
17 your patience while we caucused this morning. We had  
18 some very serious discussions about fans and  
19 regulated products. There is concern in our industry  
20 that regulating fans in regulated products will  
21 impose an untenable burden on our manufacturers. And  
22 I know there are challenges to making sure that fans

1 are not entering the marketplace and there are  
2 loopholes to prevent where their fans -- would say  
3 are going into their products and that they are not  
4 and we are willing to work through all of those  
5 issues, however when you look at you know, furnace  
6 fans which are already regulated as a component going  
7 into products whose energy efficiency is regulated  
8 and now there is going to be stand by and off mode  
9 power.

10           There has been a lot of discussions on  
11 unitary equipment but you know from the discussions  
12 we have been having you know, fans and packaged  
13 terminal air conditioning units, single package  
14 vertical units to water source heat pumps and  
15 geothermal units, furnaces unitary equipment all  
16 across the board, even residential furnaces could be  
17 impacted by this.

18           I don't think that we would be even able  
19 to figure out a test method and a metric that would  
20 cover the situations where fans are being built and  
21 the housing of those fans are actually integral to  
22 the unit itself, but there are some of our

1 manufacturers here who can speak in more detail about  
2 those technical issues and if there is a few more  
3 minutes I would like to have them share more of what  
4 we discussed in the back room, would that be okay?

5 MR. BOSWELL: Thoughts on that?

6 MS. ARMSTRONG: Can we hold up for one  
7 second?

8 MS. PETRILLO GROH: Sure.

9 MS. ARMSTRONG: Just not to, let's just  
10 get this out of the way real quick because somebody  
11 did ask me to confirm the schedule just before we do  
12 a deep dive into scope because I imagine that is  
13 going to last or the better part of the morning if  
14 not the rest of the day. I think this is what we  
15 have as the finalized schedule so I just want to make  
16 sure that you all agree we will send out the formal.

17 Wade I did get approval to Chicago  
18 meetings, so which one did you want so I can put it  
19 on here?

20 MR. SMITH: Let me confirm that. We  
21 talked about that.

22 MS. ARMSTRONG: So the June 22nd meeting

1 in Chicago.

2 MR. SMITH: Yes.

3 MS. PETRILLO GROH: Ashley could you make  
4 it a little tighter?

5 MS. ARMSTRONG: Yeah absolutely. Okay  
6 does that work?

7 (off mic)

8 MS. ARMSTRONG: Oh you are right thank  
9 you. So this is what I have, all the rest of them  
10 would be in D.C. in June.

11 MR. WOLF: So this is Mike Wolf, I have  
12 got a few concerns here with this just based on some  
13 of the dialogue that I heard from some of the folks I  
14 hung out with last evening is that on these Monday  
15 meetings, I guess I would request that we start that  
16 at noon because my fear is some guys are planning on  
17 coming in and I know for myself I don't know that I  
18 can get here by 9 on Monday and I know I am going to  
19 have issues on some of the Sundays so some of the  
20 guys are saying well I'm just going to come in and  
21 I'll get to it at noon and if I miss a couple of  
22 hours, fine.

1           But I think missing a couple of hours of  
2 these things is pretty dang important and I think  
3 it's important that we have everybody here for the  
4 entire meeting and not coming in late and then we are  
5 going to have to rehash things and start over and it  
6 is just going to be counter-productive if we can't  
7 have everybody here for the start of the meeting so  
8 my proposal is starting at noon on Monday and if  
9 anybody has got issues with getting home because I  
10 know we are going to lose a couple of our guys today  
11 at noon or something like that and I have the same  
12 concern on the back end.

13           If you feel you are not going to be here  
14 for the entire meeting on the back end speak now  
15 because I just don't think it's fair to this  
16 Committee or fair to this process for people to be  
17 cutting out early and I am certainly respectful of  
18 everybody's personal time but you know we have to  
19 make sure we set a schedule here that people can get  
20 to.

21           Now let's move on and go back and revisit  
22 the proxy issue. That was a joke, for the record.

1 MS. ARMSTRONG: I have no problem with  
2 that other than you are cutting out half a day's  
3 worth of negotiations so maybe that's okay -- it's  
4 really up to the Committee if we think we can do it.  
5 Really you are just doing two half day meetings. I'm  
6 not sure that will give you enough time ultimately.

7 MS. PETRILLO GROH: It looks like there  
8 are three Mondays that we are talking about?

9 MS. ARMSTRONG: Yeah I put them on the  
10 noon thing.

11 MS. PETRILLO GROH: Okay can we maybe do  
12 like 10:30 or 11:00 to --

13 MS. ARMSTRONG: 6.

14 MS. PETRILLO GROH: To 6.

15 MR. WOLF: I don't think I can get here  
16 from central Wisconsin, I'm sorry we are near  
17 Siberia.

18 MS. ARMSTRONG: But at least 11 would be,  
19 you would miss maybe the beginning recap and if today  
20 proves anything 48 minutes -- 45 minutes of that was  
21 caucusing with different groups anyway so.

22 MR. WOLF: Well true but I want to be here

1 for that caucus. And I mean I have -- if we are here  
2 I have no problem going later I mean, I don't know if  
3 I -- but I think going to 6 or something maybe is  
4 reasonable. Honestly by that time I'm starting to  
5 wear thin, I don't know maybe the rest of you guys  
6 have more stamina than me but if you would go from  
7 say noon until 6 or 7 does that get us kind of back  
8 to something reasonable Ashley?

9 MS. ARMSTRONG: Yeah let's try 6 I'm not  
10 sure security wise I can get you guys out of here if  
11 we stay until 9. Maybe that's not necessarily a bad  
12 thing to get to consensus so.

13 MR. HARTLEIN: Ashley from what we are  
14 seeing that will save about \$400.00 per head per  
15 night if we can just bring a pillow.

16 MS. ARMSTRONG: You know it may get to  
17 that. We are going to become good friends. I can  
18 bring my kids in for entertainment. So how  
19 does this look? It's okay? It's okay.

20 MR. FLY: This is Mark Fly. Did we  
21 eliminate the 7th and 8th I guess I missed that  
22 yesterday?

1 MS. ARMSTRONG: I think we moved them up a  
2 week.

3 MR. FLY: Okay so there's a month there  
4 for our June and July.

5 MS. ARMSTRONG: Correct.

6 MR. BOSWELL: I am also assuming that if  
7 we are starting at noon that if people come prepared  
8 we won't be breaking for lunch and working straight  
9 through from noon until 6 for some normal breaks as  
10 we go through.

11 MS. ARMSTRONG: Yeah so just bring your  
12 lunch if you have just arrived at the airport.

13 MR. BOSWELL: And also --

14 MS. ARMSTRONG: Reagan has some pretty  
15 good eating options these days.

16 MR. BOSWELL: And if you have time to stop  
17 at the DOE cafeteria you can bring things from there  
18 as well.

19 MS. PETRILLO GROH: Do we need the same  
20 noon time for the meeting in Chicago?

21 MS. ARMSTRONG: Oh, it's nice for the west  
22 coasters who have to come out the day before for all



1 of the other meetings either way.

2 MS. WALTNER: That's nice.

3 MS. ARMSTRONG: Okay so I actually have to  
4 announce these in the register so we are going once,  
5 going twice it is not going to change.

6 MR. SMILEY: There is still a discussion  
7 on the Chicago meeting do we start first day at noon  
8 or earlier?

9 MS. ARMSTRONG: The west coast asked for  
10 noon.

11 MR. SMITH: In this case you have people  
12 traveling from the east coast.

13 MR. SMILEY: Yeah can they get there by  
14 noon on the same day?

15 MR. HAUER: Armin Hauer speaking. What is  
16 the purpose in Chicago, what do we do there, a lab  
17 tour and things, can this be?

18 MS. ARMSTRONG: I think we are doing the  
19 same thing that we are doing here. It's going to be  
20 actual negotiation sessions. To the extent you know  
21 people are interested in a lab tour and AMCA is nice  
22 enough to offer or host that I think we would do it

1 on a separate day before, day after kind of thing.  
2 People would stay if they were interested in that but  
3 these are going to be negotiated.

4 I mean we are going to have you know a  
5 court reporter, we are going to have legal, we are  
6 going to do our negotiation sessions just you know,  
7 in Chicago.

8 MR. HAUVER: Right if you need a tour we  
9 have to do it before or after.

10 MS. ARMSTRONG: Correct, that would be my  
11 suggestion.

12 MR. SMITH: So our meeting room is  
13 unfortunately going to be in construction during June  
14 so if it's okay if we could move that to the July, I  
15 think that would be better for AMCA.

16 MR. WOLF: Mike Wolf, Greenheck, I'm sorry  
17 is that AMCA room going to be big enough to  
18 accommodate this group? The training room?

19 MR. SMITH: Yeah the training room there  
20 will be no problem.

21 MS. ARMSTRONG: Okay.

22 MR. SMILEY: So what are the start times

1 then, did they change with Chicago or -- oh that was  
2 based on that's a Monday, okay.

3 MS. ARMSTRONG: That's a Monday.

4 MR. SMILEY: Nevermind.

5 MR. WIGGINS: Steve Wiggins, doing noon on  
6 Monday in D.C. does that help the west coast don't  
7 you still have to come in the day before?

8 MS. ARMSTRONG: Well it's not the west  
9 coast in D.C. it's the mid --

10 MR. WIGGINS: No, I already -- actually  
11 for the first meeting the 19th meeting, I'm leaving  
12 to come in on Sunday so -- you have to  
13 come in on Sunday. I can't get from Atlanta here by  
14 9 so --

15 MS. ARMSTRONG: I mean the 22nd is a  
16 Monday. So is this something we can all live with?  
17 Because I think we could tweak it forever and not  
18 everyone would be happy but can we all -- are we all  
19 happy enough to start off with scope?

20 MR. FERSTROM: Ashley this is Gary. I  
21 know I can't make it the 3rd and 4th of August and I  
22 was wondering if we might not move that to like

1 Wednesday/Thursday of that week but others may have  
2 had conflict so I'm just one person before we lock  
3 this in I would like to ask what the issues others  
4 might have with moving that back a little bit. I  
5 would hate to have to miss the last meeting but I  
6 know I have a conflict that I can't change.

7 MS. PETRILLO GROH: You are proposing the  
8 5th and 6th?

9 MR. FERSTROM: Pardon?

10 MS. PETRILLO GROH: You are proposing the  
11 5th and 6th?

12 MR. FERSTROM: Yeah I would request the  
13 5th and the 6th, okay -- can't make it. What about  
14 the 6th and 7th? No?

15 MS. ARMSTRONG: You are past your  
16 deadline.

17 MR. BOSWELL: I was going to say the  
18 deadline this is August 6th as I recall.

19 MS. ARMSTRONG: Correct.

20 MR. FERSTROM: Thank you.

21 MS. ARMSTRONG: How about the 4th and 5th,  
22 can we split the difference? One day for each of

1     you?

2                   MS. PETRILLO GROH: I would like to be  
3     here.

4                   MS. ARMSTRONG: So would he.

5                   MR. FERSTROM: I'll send a proxy, not a  
6     proxy. Sorry, sorry an alternate.

7                   MS. ARMSTRONG: I mean the only advantage  
8     of not doing it the 3rd and the 4th is the 3rd is a  
9     Monday so if we shifted it to a Tuesday/Wednesday  
10    meeting we maybe could have the 9 to 5 which is our  
11    last meeting before that term sheet and we may very  
12    well need that time.

13                   MS. PETRILLO GROH: But we can still use  
14    the 5th and 6th?

15                   MS. ARMSTRONG: We could or we could just  
16    do full days, 4th and 5th.  
17    Are people -- because I think I heard more people are  
18    not willing -- would prefer not to travel on Sundays  
19    and that is kind of family time I get it.

20                   MS. PETRILLO GROH: For the last meeting.

21                   MS. ARMSTRONG: 4th and 5th? Yes, 9 to 5  
22    okay, 9 to 6, 9 to 5, 9 to whatever. Do you want 8?

1 We will just do 9, 9 until whatever.

2 MR. BOSWELL: The 4th and the 5th?

3 MS. ARMSTRONG: Yeah I don't know what I  
4 just did but apparently --

5 MR. BOSWELL: Both are 9 to 5?

6 MS. ARMSTRONG: Correct. Okay so we moved  
7 one.

8 MR. BOSWELL: Still two meetings.

9 MS. ARMSTRONG: All right that's it. We  
10 will send out the schedule tomorrow so that everyone  
11 has it. So I think it's probably good to pick up  
12 where Laura kind of started us this morning and  
13 really try to talk a little bit about scope. One of  
14 the things that the team here was kind enough to do  
15 last night overnight was to try to put in some of the  
16 discussion into -- and I think this is what we are  
17 talking about, into some slides to help facilitate.

18 This isn't necessarily representative of  
19 DOE's opinion but this is representative of something  
20 -- some of the discussion that we had yesterday so I  
21 think we can talk about you know, what should the  
22 scope be, should it be the same thing that AMCA

1 suggested yesterday? Should there be any exceptions  
2 to that scope? Maybe exceptions isn't the right word  
3 because they are still covered by I guess that's  
4 where I think we would like to start the discussion.  
5 I'm not sure exactly who would like to start it off  
6 but --

7           So this is Ashley from DOE. I think they  
8 are intertwined right? I mean the ask is about  
9 embedded products and so I think the discussion with  
10 respect to where we are at, so is the ask from the  
11 AHRI embedded product manufacturers that are  
12 represented here for you to be completely not  
13 included in the standards for fans, is that your ask?  
14 Can you say for the record?

15           MS. PETRILLO GROH: Yes, that's what we  
16 are asking.

17           MS. ARMSTRONG: Okay so then I think I  
18 would like to hear at this point your proposal as to  
19 how you think that could actually be administered.

20           MR. BOSWELL: And I will just remind  
21 people when they speak, state your name and company  
22 for the record.

1           MR. ROY: My name is Ahiruddh Roy,  
2 Goodman. So Ashley I proposed an idea yesterday as  
3 far as regulated products are concerned, we are  
4 already submitting certification reports to DOE and  
5 perhaps the fan manufacturers you know for them you  
6 can add a column in the reports that states or  
7 specifies that manufacturers applying that particular  
8 basis model to an existing regulated product OEM,  
9 something along those lines. And that would possibly  
10 address this issue.

11           MR. FERSTROM: Ashley this is Gary. I  
12 don't know at this point whether I support AHRI's  
13 proposal or not but I think at a minimum there is an  
14 enormous amount of energy saving potential associated  
15 with this exemption and I think this group needs to  
16 evaluate it in order to come to a prudent consensus  
17 on how to treat this proposal.

18           So as we proceed I think it's important  
19 for DOE and its consultant and lab analyst to look at  
20 that market and evaluate how much energy is  
21 associated with it.

22           MR. BOSWELL: Okay so --



1           MR. SMILEY: Bill Smiley, Trane. I don't  
2 necessarily know if there is a large amount of energy  
3 associated that could be saved with covered products.  
4 I have not seen any data or analysis. I do know from  
5 my experience that I do not believe there is a  
6 significant amount of energy to be saved in regulated  
7 products because they are already regulated to  
8 product efficiency overall.

9           I believe that our design practices are  
10 always to try to use the most efficient combination of  
11 components. And the way they are applied I know from  
12 experience that you can take an extremely highly  
13 efficient fan and incorporate it into an OEM type  
14 product and have a lower overall unit performance  
15 because you are not utilizing the other components as  
16 effectively.

17           For example if you take a house  
18 centrifugal fan and you put it in a rooftop you know  
19 it may not provide air flow distribution across the  
20 coil. It may not end up utilizing the coil  
21 effectively if you have that type of fan where you  
22 could use a lower efficient fan that adapts and

1 interacts with those components much better. So I  
2 struggle with how do we determine what the fan  
3 efficiency is on an applied product or a covered  
4 regulated product or an embedded fan.

5 Do you define the fan requirement as a  
6 stand-alone where it doesn't operate that way and it  
7 can't operate as it does in a unit without components  
8 of the unit? Do you test the unit? If you test the  
9 unit there's a million combinations to that unit so  
10 you burden the manufacturer with testing and  
11 regulating every one of those units. I just -- I'm  
12 not ready to go to the point where let's say  
13 regulated products, embedded fans should be covered  
14 by this.

15 I think they should be exempted at this  
16 point in time. Thank you.

17 MR. BOSWELL: I think Mark you are next.

18 MR. FLY: Okay you said most of what I was  
19 going to say but you know a lot of times these fans  
20 inside of packaged regulated products are applied in  
21 such a way that you cannot pull that fan out and  
22 actually put it in a 210 and test that fan alone,

1 nothing holds the fan up. I mean it's an integral --  
2 the housing and everything is an integral part and an  
3 integral part of the next component become component  
4 upstream and downstream in the airflow -- the  
5 system effects that the cabinet impose on the fan  
6 itself makes it operate completely differently than it  
7 would with that stand alone fan test component.

8           So those are part of the complexities of  
9 doing this and like you said there are a lot of times  
10 when you are -- the applicability of the fan design  
11 is very much related to the upstream and downstream  
12 components and what you are trying to accomplish  
13 there and so you could greatly affect the thermal  
14 efficiency of the unit by changing the  
15 characteristics of the fan.

16           And most of us that build packaged  
17 equipment you know we don't care too much about  
18 velocity pressure because we kind of live in a 500  
19 foot a minute world, because that is what makes  
20 heaters and coils run properly and there is very  
21 little velocity pressure at that point.

22           Condenser fans are kind of the same way

1 for your blowing, discharging up into the air so you  
2 don't have the chance to static regain off that  
3 velocity pressure and make that fan efficient. You  
4 are basically doing an open free discharge so you are  
5 not maximizing that.

6 If I go messing around with what kind of  
7 condenser fan I have I will change the coil design or  
8 the coil performance significantly and so my SEER or  
9 EER or whatever metric we are using today on that  
10 particular product will change drastically.

11 So the net goal is to save energy at the  
12 point of use. It's better regulated with a bigger  
13 envelope around what we are trying to save energy on.

14 MR. BOSWELL: Mike did you have a comment?

15 I think Gary you are next.

16 MR. FERSTROM: So this is Gary for the  
17 California Investor Owned Utilities and I think the  
18 advocates in general. We are not here to talk about  
19 guessing, we want to find a way to measure these  
20 things and evaluate them and come to a good,  
21 objective, creditable consensus. My recollection  
22 goes back to the pumps working group where the

1     Hydraulics Institute noted that circulator pumps were  
2     small and insignificant and ought to be exempted from  
3     the rulemaking and not considered by the working  
4     group.

5                     It turned out that they were considered  
6     and they were found to have associated with twice the  
7     energy savings of all the rest of the pumps put  
8     together so I don't think we ought to summarily  
9     dismiss the opportunity to evaluate how regulations  
10    might work for fans in unitary equipment.

11                    I think it's important this group evaluate  
12    that. Then based on the evidence we can decide how we  
13    want to move forward.

14                    MR. BOSWELL:    Laura?

15                    MS. PETRILLO GROH:  I think some of what  
16    we are struggling with, it's Laura Petrillo Groh,  
17    AHRI -- I think some of what we are struggling with  
18    is even how to capture that energy savings or not the  
19    energy savings potential, but the fan energy in such  
20    a wide variety of unit types in a variety of  
21    applications so would there be suggestions on how  
22    that could even be evaluated?

1           MR. HAUER: I cannot understand why the  
2 assembly of components -- of efficient components  
3 results in a less efficient product. Of course you  
4 would also have to redesign the unit in order to take  
5 advantage of the efficiency gains for more efficient  
6 components. This is just an ecodesign approach so I  
7 think the industry should indeed not just replace the  
8 fans with a more efficient fan but also redesign the  
9 units clearly.

10           MS. PETRILLO GROH: That's a good point  
11 Armin. This is Laura Petrillo Groh, AHRI and then  
12 Greg has a question. Has any of this to any extent  
13 been captured in DOE's analysis to date and would it  
14 be possible to capture the redesign of the units to  
15 take advantage of the redesigned fans even in this  
16 unit and again we just need to figure out how we  
17 would be able to capture the energy savings for the  
18 fans to evaluate it.

19           MR. BOSWELL: Ashley do you want to  
20 respond to the question?

21           MS. ARMSTRONG: Sure. I think the  
22 NODA that you have seen today doesn't account for the

1 potential redesigns and the cost or the benefits that  
2 they would provide from better products. Certainly  
3 we are happy to work on that analysis. In order to  
4 do so, the embedded product manufacturers would need  
5 to come to the table with data and help us.

6           You know from what Gary is asking for, I  
7 think it would be very helpful if AHRI and its  
8 members and other embedded product manufacturers that  
9 may not be members of the AHRI, would provide  
10 connected load of OEM products as a percent of fans  
11 connected load. That really gets to what you are  
12 looking for, that helps inform the decision about  
13 whether this does matter or not.

14           And to the extent you want to make a case  
15 that they should or should not, that's really the  
16 data that helps inform that case. So I think  
17 realistically to back your proposal, for what you  
18 are asking of this group, you need to provide data  
19 that supports it.

20           MR. BOSWELL: Okay I think Greg was next  
21 in line.

22           MR. WAGNER: Greg Wagner, Morrison. I

1 think the discussion got lost on the fact that the  
2 power and energy consumption of those fans is already  
3 included in the overall regulation of those products  
4 so we are not talking about eliminating the measure  
5 of energy consumed by a fan. It is included in the  
6 measure of how that unit performs and what the folks  
7 here talked about is, it is an equation beyond just  
8 the fan itself.

9           It's talking about how the heat transfer  
10 and the effectivity of the rest of the system is  
11 relative to that fan and those things go hand-in-hand  
12 in terms of how you get to the most effective  
13 product. And there aren't many cases where the  
14 overall system design uses a less efficient than the  
15 maximum efficient fan but achieves lower energy  
16 consumption as a unit as a whole and it is those  
17 kinds of products that the concern is from the  
18 manufacturers of those equipment.

19           MR. BOSWELL: So I'm seeing three tent  
20 cards on this side if we can start there and just  
21 work down.

22           MR. ROY: Aniruddh Roy, Goodman. I would



1 like to address two points. Gary made a point about  
2 -- Gary Ferstrom made a point about energy savings  
3 potential in unitary equipment. You know we should  
4 assess what the certification burden would be for  
5 let's say a manufacturer that just bought an impeller  
6 and then you know modified the design based on the  
7 cabinet needs and you know as far as the  
8 certification burden is concerned you know you have  
9 reporting requirements, additional reporting  
10 requirements than what you currently have in place  
11 for EER with the annual filing requirements and so  
12 that should account for -- I think DOE already  
13 addresses the energy savings in another rulemaking.

14 And so any discussion of energy savings  
15 potentially should be part of that working group or  
16 other rulemakings so that is one point and then as  
17 far as the equipment redesign is concerned, you know  
18 the point that Armin made. Again that's you know,  
19 not in the scope of this discussion, you know the  
20 equipment redesign is at a covered product level and  
21 those are already being addressed at various  
22 different rulemakings and DOE showing the quad

1 savings through those final rules so you know I don't  
2 see why you know we are not already capturing that  
3 energy savings potential through those regulated  
4 metrics.

5 MR. BOSWELL: Wade?

6 MR. SMITH: Okay so Laura asked --

7 MR. BOSWELL: Name and organization.

8 MR. SMITH: I'm sorry, Wade Smith. Laura  
9 asked how would you calculate this you know, it's not  
10 rocket science to determine the most typical fan  
11 power draw in any particular unit size and  
12 multiplying that number times the number of units  
13 that are shipped in a year it's not a difficult  
14 exercise to determine how large the connected load of  
15 fans is in these markets.

16 So what Gary is asking is he would like to  
17 see what that number is and I don't think that's an  
18 unreasonable request. It's pretty simple.

19 MR. FERSTROM: So --

20 MR. SMILEY: Were you called on?

21 MR. BOSWELL: Actually yeah you were up  
22 and down.

1           MR. FERSTROM: This is Gary. With respect  
2 to the dual regulation yes the unitary equipment is  
3 tested, reported and regulated with respect to its  
4 heating and cooling performance but correct me if I  
5 am wrong, I think this unitary equipment for the  
6 majority of hours in a year actually serves a  
7 ventilation purpose in commercial buildings and I  
8 don't think that ventilation function is really  
9 captured by the heating and cooling performance test  
10 so that's why I think it's important to evaluate this  
11 opportunity.

12           MR. BOSWELL: Okay, Geoff?

13           MR. SHEARD: Geoff Sheard, AGS Consulting.  
14 Approximately 4, maybe 4 years ago, I had exactly  
15 this same discussion with the European Commission  
16 Policy Officer responsible for regulation 327 where  
17 the point was being made regulating fans and  
18 regulated units was unreasonable.

19           And his pushback was you are not going to  
20 get away with it that easily, we are going to  
21 regulate them, but we are going to regulate you too.  
22 Get over it. And that was the end of the discussion.

1 So I am not advocating that was a reasonable position  
2 but I am advocating that I have got over it.

3 MR. BOSWELL: Laura I think you were next.

4 MS. PETRILLO GROH: To Wade's point I  
5 think that looking at the fan power as you have  
6 suggested looking at it is not -- it is more  
7 difficult than you have suggested. Looking at the  
8 fan draw for the unit I mean we have got so many  
9 different configurations of units with so many  
10 different pressure drops and other pertinences within  
11 these units that you would never even be looking at  
12 the same metric as you would for a free-standing fan,  
13 you are not looking at apples to apples in these  
14 comparisons.

15 And I don't know what venue it would  
16 evaluate. Mark knows a lot more about the testing of  
17 this.

18 MR. BOSWELL: Ashley?

19 MS. ARMSTRONG: So I think we are getting  
20 a little off track here. Your ask of this group and  
21 DOE to a certain extent is to make -- to potentially  
22 consider not setting standards for certain types of

1 fans, certain categories of fans that may be embedded  
2 in products. I don't think it is unreasonable to ask  
3 for data to support that. Why should we do that?  
4 Not just ascertains, but I also -- I think more  
5 fundamentally I don't think a self-declaration  
6 manufacturer's scheme is an enforceable way to do  
7 that either. So that's a non-starter for DOE.

8 So I want to hear what differentiates  
9 these products. How would you tell embedded from not  
10 and a manufacturer's self-declaration is just not  
11 going to work.

12 MS. PETRILLO GROH: Ashley this is Laura  
13 Petrillo Groh from AHRI. DOE's own analysis doesn't  
14 include any of these products right now so it is not  
15 just us who is not asking to be regulated, it wasn't  
16 even DOE's consideration -- it hasn't been until now.

17 MS. ARMSTRONG: I don't think that's  
18 accurate. We put out analysis for which data was  
19 provided to us to help inform interested parties you  
20 know, to work with them. We are happy to do that  
21 analysis and you haven't seen a proposal, you don't  
22 know what analysis will come out that will support a

1 DOE proposal. We could revise analysis, we haven't  
2 taken a policy position on what fans may or may not  
3 be in yet. The proposed rule has not come out yet.

4 MS. PETRILLO GROH: And that's what we are  
5 here to discuss but in the framework document it said  
6 regulated products were excluded, all of DOE's  
7 analysis, all of the fan data basis have excluded  
8 this until now so you know to discuss you know how we  
9 would collect that connected load is one aspect but  
10 you know no manufacturer impact analysis has been  
11 addressed on DOE's side and that would need to happen  
12 as well.

13 MS. ARMSTRONG: And I think this started  
14 with my opening by saying we would be happy to  
15 conduct additional analysis to the extent it was  
16 needed if manufacturers would be willing to also  
17 share some data about -- like the AMCA members have  
18 to help support that analysis, we are happy to go  
19 through that and help Gary with his decisions, but I  
20 think fundamentally what you are asking for needs to  
21 be supported by data.

22 And so that is what we are asking you to

1 do for this Committee. I mean this may be an issue  
2 where we are just never going to get past it, I don't  
3 know. I definitely hope that is not the case but I  
4 certainly think we should figure that out today. I  
5 mean if the answer is always going to be, you know  
6 you shouldn't do it for x, y and z reasons but we are  
7 not willing to go collect data or do additional  
8 analysis or help DOE to do an analysis to help inform  
9 the Committee's decision then I think that should be  
10 stated.

11 MS. PETRILLO GROH: And at no point did we  
12 say that we would not collect data. We are having  
13 trouble figuring out what data to collect and how to  
14 collect it.

15 MR. WOLF: This is Mike Wolf, Greenheck  
16 could I jump in? Let me maybe suggest we reframe the  
17 question in the perspective here to something a  
18 little more fundamental and that is kind of to Gary's  
19 point there's a perceived significant amount of time  
20 where this piece of equipment isn't a piece of  
21 equipment, it's just a fan.

22 So the question is where does a fan begin

1 and where does the fan end. Okay? Because one of  
2 the concerns here is an unintended consequence of  
3 taking a fan, putting it in a box and I don't  
4 remember if it was Bill or Mark that made the comment  
5 or maybe Greg, I can't remember you know, I don't  
6 know but you could take a fan that by itself can  
7 stand alone, test it in accordance with say AMCA 210  
8 the industry methods of test and it could perform  
9 very, very well. Now you take it and you put it in a  
10 box where you have dampers and coils and filters and  
11 so on and so forth and you take a fan that's less  
12 efficient as a stand-alone component and put it in  
13 there and the less efficient fan actually ends up  
14 working better because of all of the twists and turns  
15 and stuff that goes on in the box relative to system  
16 effect.

17 So there is also that concern that we have  
18 an unintended consequence of taking a stand-alone fan  
19 and actually end up using more energy when it is  
20 applied in whatever this equipment happens to be so  
21 that's one thought. The second thought I have is if  
22 there is a and I'm not familiar with the regulation



1 you are talking about with regard to unitary  
2 equipment so on and so forth, but I think there's a  
3 theory here okay if I regulate the components, I  
4 regulate the motor and I regulate the drives and the  
5 fan in this stuff, that some of these more efficient  
6 components makes the overall product more efficient  
7 and one of the discussions that took place in our  
8 breakout meeting was that you know what that might be  
9 the case for motors, it might be the case for some of  
10 the other components but that premise doesn't hold  
11 for fans.

12           Just because you have a more efficient  
13 stand-alone fan it is not more efficient when you put  
14 it in the box. And I'm not here to say whether it is  
15 or isn't, what I am here to say is if that product is  
16 being regulated already, why don't you tightened the  
17 screws on that regulation because it appears you have  
18 got some loopholes in that regulation that is not  
19 evaluating that product to the full extent of its use  
20 you know and Gary's term if it is not used for  
21 heating and cooling and that's all you are regulating  
22 it for well then you have a loophole in that

1 regulation.

2           Why you know, complicate this regulation  
3 with something that is not covered properly in a  
4 different regulation?

5           MR. BOSWELL: Okay and I think Mark you  
6 have been waiting.

7           MR. FLY: So Ashley you've asked for data  
8 and I'm sitting here trying to figure out what kind  
9 of data we could get you. I mean do you want data of  
10 volume unit shift and the fan energy rated at a test  
11 standard rating condition? Do you want it how it is  
12 actually applied which sometimes we don't even know?

13           You know part of the problem with  
14 equipment that we do you know we are not running at  
15 maximum fan speed typically -- hardly ever, and we  
16 are not -- and we apply you know that unit can be  
17 applied at half inch of static pressure or six inches  
18 of static pressure because it is going to a hospital  
19 surgery suite with HEPA filters and everything else  
20 status stream so you know I think that the industry  
21 would like to provide data but we are struggling with  
22 what kind of data you are really looking for. Are we

1 looking for reality or are we looking for some ideal  
2 test standard condition?

3 Because a lot of time in the regulatory  
4 and code world people want a pass/fail, one single  
5 number thing and this is not a one single number  
6 problem.

7 MR. BOSWELL: Duane?

8 MR. DADDIS: This is Duane Daddis from  
9 Carrier. The question came up before how can we  
10 differentiate these fans and one alternative I will  
11 throw out is labeling. The fan supplier could supply  
12 a label stating something like for use in only  
13 equipment only or regulated equipment only. And the  
14 second point that I wanted to make is I had the same  
15 question that Mark had, Wade you had mentioned that  
16 there was some way to calculate this but I am not  
17 sure if we have really defined what we are going to  
18 calculate -- is it a theoretical fan savings or is it  
19 -- in reality it would be very difficult to determine  
20 what the energy savings or the energy consumption of  
21 one fan in my equipment and then if I put in a  
22 different type of fan that would require a test or

1 some more sophisticated analysis that you know just a  
2 maximum efficiency type analysis.

3 MR. BOSWELL: And we actually have one  
4 member of the public on the web that has a comment  
5 that we are going to open the mic for and that person  
6 has been in queue for a while so if we could open the  
7 mic for that comment. Could you identify yourself.

8 MR. GABR: Yes this is Sham Morten Gabr  
9 from Multi-Wing in Denmark and we are also a  
10 representative in U.S. in Cleveland and I have a  
11 question whether it could be an option to consider for  
12 unregulated equipment manufacturers to use the data  
13 from repair manufacturers. The situation is that a  
14 lot of OEM manufacturers are building impellers  
15 and copying the motors and they are doing it by  
16 ordering multiple kit samples, by that they can see  
17 what is best for the final functionality so even  
18 though the system efficiency problem they know by  
19 trying different prototypes what would be the best.

20 So in short my question is: could it be an  
21 option for unregulated OEM equipment to consider  
22 using data from impeller suppliers?

1           MR. BOSWELL: Okay thank you. We are  
2 going to go back to comments in the room, if someone  
3 would actually like to address we can get to that  
4 comment or question kind of in queue as people are  
5 waiting so, yes?

6           MR. ROY: Aniruddh Roy, Goodman. I would  
7 like to just go back to the framework document and I  
8 know Laura has mentioned this a few times. The  
9 framework document from 2013 has a section 1.1 which  
10 says EPCA coverage of commercial and industrial fans  
11 and concluding or the concluding summary in that  
12 section says DOE is not considering standards for  
13 fans that are a component in regulated commercial  
14 products in this rulemaking.

15           I would like to know in these last few  
16 years what has changed that interpretation from an  
17 EPCA standpoint and whether DOE got some date in  
18 those two years to suggest that this stance should  
19 change currently.

20           MS. ARMSTRONG: So this is Ashley from DOE  
21 and I think we are mixing apples and oranges as we  
22 clearly stated at the outset of this. You know the

1 fan -- there's no fan definition right now in EPCA.  
2 DOE has the authority to cover fans. Now DOE is  
3 going to set up a definition so you are mixing EPCA  
4 with what DOE tentatively stated at the outset of the  
5 framework document and as we do in our rules we get  
6 comments and we have investigated further and we have  
7 learned stuff over the last couple of years because  
8 it is our due diligence to do the analysis, to look  
9 at the market, to better understand the products and  
10 how they might be regulated and I think what we have  
11 found over that time frame is that it is really hard  
12 to differentiate that from the point of the fan  
13 manufacturer -- it's really nearly impossible to  
14 differentiate with a fine line what would be a fan  
15 that's embedded and what would be a fan that's not.

16 That raises the issue of a potential major  
17 loophole. Now like I said it's not a foregone  
18 conclusion for the Department, we haven't made a  
19 policy decision as to what we want to do with fans,  
20 but what I am trying to tell you is we are here to  
21 discuss it. We are not here to relive the framework  
22 document. You can keep talking about it but -- we

1 have moved on.

2 MR. ROY: Yeah Ashley --

3 MS. ARMSTRONG: Hold on, but I think  
4 moreover to that we are here to come together on a  
5 consensus and you are asking for the Committee to  
6 consider something and what you are hearing from the  
7 concerns of the Department is differentiation,  
8 enforceability, loopholes. From the point of the fan  
9 manufacturer, how do we tell the difference and we  
10 are open to considering all aspects of the scope of  
11 this rule however self-declaration is not on the  
12 table.

13 MR. ROY: Anniruddh Roy, Goodman. I think  
14 Greg Wagner yesterday had made a point about the fact  
15 that there is a way for fan manufacturers to capture  
16 that information. I think correct me if I am wrong,  
17 but the Morrison Products has an idea of where their  
18 products are going, to which OEM's.

19 MR. BOSWELL: Okay I think Wade was next.

20 MR. SMITH: Yeah I think the question that  
21 you asked Mark is a good one. I guess when we went  
22 into the discussions we imagined in our own mind what

1 kind of data would be needed and appropriate you know  
2 so that people can make informed decisions and went  
3 about gathering that data. Of course DOE in their  
4 framework and subsequent documents they have asked a  
5 series of questions and some of what we -- the data  
6 that we gathered was in direct response to those  
7 questions but some of it was to inform our own  
8 deliberations about what we wanted as manufacturers  
9 of fans.

10           And so I'll take as an example a fan  
11 category from the data that we gathered has very,  
12 very low numbers of horsepower connected to the grid  
13 and we are interested in developing, advocating and  
14 supporting the regulation that maximizes the energy  
15 savings while minimizing the negative impacts on our  
16 manufacturer members.

17           And so putting a lot of investment into  
18 redesign of a product that has very little connected  
19 load is a lot of bang but very little buck so to  
20 speak. Whereas some products have a lot of connected  
21 load and very, very efficient alternatives are  
22 actually available on the market and in consequence



1 the investment required by our manufacturing members  
2 to offer more efficient products is very low, yet the  
3 benefit in terms of savings through regulation is  
4 very high.

5           So those kinds of trade-offs are the  
6 fodder of debate and consideration in the process.  
7 If the -- like you I think and like most of the AHRI  
8 members our efforts ignored fans embedded in  
9 regulated equipment because the framework indicated  
10 to us that that wouldn't be in play. The fact that  
11 it is now in play suggests that that kind of effort  
12 is needed and you know, I think your question is a  
13 good one and you know it would be nice I think if DOE  
14 and/or this group right would say well okay so these  
15 are the things that we need in order to give this  
16 full consideration.

17           And Laura's comment earlier is well taken  
18 and that is that -- and yours and that is the  
19 application conditions defined have a tremendous  
20 influence on the amount of energy that a fan  
21 consumes. That said if you are trying to estimate  
22 the connected load of the market you may have those

1 application conditions and in our case AMCA members  
2 provided that level of detail on an awful lot of the  
3 data that they supplied.

4           But there is also a lot of data that we  
5 gathered in which the application conditions were not  
6 known and so we didn't know however the horsepower of  
7 the fan motor and so one way or another if you are  
8 making the best efforts to calculate what the  
9 connected load is for a given unit size, you come up  
10 with an answer and that answer is not precise and it  
11 is not accurate but it is not significantly wrong  
12 either.

13           And so this is the process by which one  
14 informs the debate and I think what Ashley is saying  
15 is that the folks around the table would welcome that  
16 discussion but there hasn't been an effort in part  
17 because the framework led us down a different path  
18 but there hasn't been an effort to engage, to provide  
19 that kind of information and then to inform that kind  
20 of debate.

21           And I think that's where we ought to go  
22 with this personally.

1 MR. FLY: Can I respond?

2 MR. BOSWELL: Ashley? I would like to  
3 keep things in somewhat of a sequence, Steve has been  
4 waiting.

5 MR. DIKEMAN: Steve Dikeman with  
6 AccustiFLO. My products don't end up in regulated  
7 products and so that's a little bit of a foreign  
8 subject for me so I guess you know Gary started to  
9 mention something that if I understand it, the  
10 unitary gear that we are speaking of here has some  
11 regulation on its annual cooling efficiency, your  
12 heating efficiency, something like that, is that a  
13 good overview of that, but the fan only part of that  
14 is not currently regulated, is that correct in  
15 general?

16 MR. FLY: Well it's embedded in --

17 MR. DIKEMAN: When I do the heat rating I  
18 have the fan energy. When I do the cooling rating I  
19 have the fan energy but Gary's point was there's gobs  
20 of hours where it may be a fan totally, so it shifts  
21 fan consumption. Now do I also understand or can I  
22 make this analogy that if I -- residential furnaces

1 were regulated and they would probably have been  
2 regulated as a heating efficiency with fan on but now  
3 the Department is also regulating the fan within the  
4 furnace itself and how is -- or is there a similarity  
5 or differences in what was done there?

6 MS. ARMSTRONG: Can I respond to that?  
7 How is the furnace rated -- it is two completely different  
8 tests. The AFUE didn't account for the  
9 blower energy and so the statute was changed by  
10 Congress which directed DOE to specifically set  
11 standards and test procedures for just the blower of  
12 the furnace and that's what we did.

13 So now there are two tests for the same  
14 product and they are regulated separately.

15 MR. DIKEMAN: And how were you able to  
16 capture the fan energy because it is working in that  
17 unique environment wouldn't that be analogous to what  
18 we are talking here?

19 MS. ARMSTRONG: Correct, we wrote a test  
20 procedure and it is working and it is being  
21 implemented now and yep we were able to do it.

22 MS. PETRILLO GROH: The key part being you

1 wrote the test procedure. Right now our products  
2 don't test for fan efficiency, we test for energy  
3 efficiency and there is no test procedure to collect  
4 this information for the wide swath of products that  
5 we have been talking about. Sorry this is Laura  
6 Petrillo, AHRI.

7 MR. BOSWELL: There has been somebody  
8 standing --

9 MR. DELANEY: Yeah, Dan Delaney, Regal  
10 Beloit. Speaking on behalf of NEMA and obviously we  
11 are talking about this wired air concept. It's  
12 important and we mentioned -- Mark mentioned here  
13 before looking at the efficiency of the components  
14 versus a system there is no perfect world when it  
15 comes to any point when you look at that total fan  
16 definition we had before the motor is tested at a  
17 perfect condition so our regulation is that perfect  
18 condition obviously doesn't consider all the  
19 additional ratings, it's at a 1-0 point. Obviously  
20 many of the applications don't run the hours that it  
21 was evaluated at, many of them don't run at the loads  
22 that it was run at.

1           So many of these things that you are  
2 talking about the motor perspective as well as let's  
3 say a motor control, they only consider what can be  
4 tested as part of the test definition and I would  
5 challenge the fan group to look at that same  
6 definition. While it may not be every single  
7 application, it does have to be defined within its'  
8 let's say "fan type" that you guys already have some  
9 definition on.

10           But one thing I did want to provide some  
11 clarity on that fan definition we had talked about  
12 this with some AMCA members earlier, the motor group  
13 has been working with the control group for many  
14 years on this system side and what we call the  
15 control and the motor together with upstream and  
16 downstream components is a power drive system and  
17 what we have come up with, unfortunately was really a  
18 little bit too late for the pump side but DOE is  
19 using basically the same method that both the  
20 Europeans and the U.S. -- it's really a global  
21 standard, it's an IEC standard and the 61800 series  
22 but the development of that standard really gives you

1 let's say an efficiency method to provide part load  
2 loss data for controls and motors, okay.

3           So whether a motor manufacturer, a drive  
4 manufacturer or a motor driven system and  
5 manufacturer could grab, define losses for those  
6 components already defined as well as an  
7 interpolation, extrapolation method you can get to  
8 any one of those points. To everyone's point here  
9 you have those let's say perfect conditions of losses  
10 defined for motors and controls, each person can  
11 still -- let's say get the test method, extrapolate  
12 to that loss so you can determine where that  
13 appropriate point is and utilize that.

14           So I would certainly like to volunteer  
15 NEMA to work with both of the groups here to let's  
16 say utilize that same method or that hard drive  
17 system which I think obviously is a system that is  
18 not just going to be here in the United States but  
19 also globally, thank you.

20           MR. BOSWELL: Greg?

21           MR. WAGNER: I'm not sure where we are in  
22 all of this but going back to a couple of comments

1 before we were talking about how do you  
2 differentiate products and how do you regulate them  
3 and enforce action. The DOE can only really enforce  
4 when a product is place in the marketplace and it is  
5 found to be not compliant with the standard and so as  
6 such it needs to find it from that distribution or  
7 other channel and that's the way it is done for all  
8 of those things.

9           There has been some concern about how do  
10 you keep imports from having faulty parts and all of  
11 that -- well there has been a number of circumstances  
12 over the years where there have been air conditioning  
13 systems and others that didn't have the appropriate  
14 regulatory components or refrigerant or what have  
15 you.

16           They get stopped because they don't comply  
17 and that's the way those things are enforced. As far  
18 as how do you tell on a production line where a  
19 product goes in our case it is very simple,  
20 every part has a part number and that's listed on the  
21 product and that goes to a customer and those  
22 customers have either approved regulated products or



1 they don't have approved regulated products but we  
2 know where those things go and it's not very  
3 difficult to track that.

4 We invoice customers and we have tracking  
5 through our system of every single detail, where  
6 every part goes -- in fact it is down to the second  
7 on that sort of thing so it is easy to track and  
8 record that stuff.

9 The other comments about the run hours and  
10 calculating the energy consumption -- DOE has great  
11 resources and put together the RECS data for  
12 residential. They have considered a model that  
13 represents the United States and it takes into  
14 account the energy consumption on a residential  
15 basis.

16 I don't know if there exists such a thing  
17 for the commercial side. If there does, that is  
18 probably the only way that you are going to be able  
19 to put together some kind of methodology to calculate  
20 what the energy consumption of any given group of  
21 fans or set of fans, you know. For example we are  
22 hearing in Washington area, depending on what time of

1 year it is, the demand load on any appliance for  
2 heating and air conditioning is going to depend upon  
3 the heat calculation and the cooling calculation so  
4 usually it is somewhere on the order of half or less  
5 what the total energy required during the peak season  
6 is, so this time of year you are going to have a light  
7 air conditioning load, in the summer you are going to  
8 have a peak air conditioning load and it is going to  
9 depend upon that load profile to be able to calculate  
10 what the total energy consumption is.

11 And outside of the DOE I don't know who  
12 would have that kind of a data base to represent the  
13 United States.

14 MR. BOSWELL: Okay Mark?

15 MR. FLY: I think another factor that goes  
16 in here because this is all going to be intertwined  
17 how are we going to regulate fans? Are we going to  
18 regulate fans as a peak efficiency so this fan is  
19 compliant and therefore it is a compliant fan and  
20 available to use or are we going to regulate fans  
21 over an operating envelope that this fan is may be  
22 compliant here but if I change to this point of

1 operation it is not compliant any more.

2           So that is going to factor in to any kind  
3 of analysis that we need to do so you know we may  
4 have -- it might be prudent to work through some of  
5 that to at least know a general direction of which  
6 way we are going before we try to put data together  
7 that's going to be meaningful.

8           Because I mean when you start looking at  
9 part load, sometimes if you selected a fan at peak  
10 efficiency many times you can't run that fan at part  
11 load without it tearing itself apart.

12           MR. BOSWELL: Okay.

13           MS. ARMSTRONG: Do you want to address  
14 that or do you want me?

15           MR. SMITH: Yeah so this is Wade Smith, so  
16 these are all really good questions and it is hard to  
17 answer the questions if you don't have a data base  
18 which represents the actual market to test those  
19 questions against so we -- as fan manufacturers we  
20 tested different regulatory schemes against the data  
21 base representing the actual market and discovered  
22 some things work, some things don't, some things are

1 practical and pragmatically can be done and there are  
2 other things that you would like to do that can't be done.

3           Some things are not deterministically  
4 linked to energy savings for example. You just  
5 brought one up. If you have -- if you are focused on  
6 peak efficiency of the fan it may not teach you very  
7 much about what the operating efficiency of the fan  
8 will be or said another way if you change the peak  
9 efficiency of the fan, it may or may not cause the  
10 efficiency at the operating point to change.

11           It might cause it to get worse and so if  
12 you create the data that's necessary to test some of  
13 these ideas then you learn a lot. You can't say what  
14 are we going to do and then I'll give you the data,  
15 no you have to have the data to decide what you want  
16 to do and you know without the data all opinions are  
17 just speculation.

18           If you don't have the data base against  
19 which to test ideas two people can have differing  
20 opinions in the room and they are both valid. But  
21 when you take those two opinions and you test them  
22 and you come up with a result now you are arguing

1 about facts, not opinions and so to bring facts to  
2 the table is necessary really, necessary.

3 MR. BOSWELL: Armin?

4 MR. HAUVER: Armin Hauer of emb-papst.

5 Some of us manufacturers here have not been regulated  
6 in the past and so there is some fear existing  
7 currently and maybe the Department of Energy could  
8 briefly indicate what they want to see in 2020 on a  
9 fan label. Do you expect to see only an indication  
10 from the manufacturer that the fan is compliant yes  
11 or no, or do you want to see an absolute percentage  
12 value, an FEI value, because if you look at the motor  
13 efficiency regulation I think this is really  
14 pragmatic and streamlined.

15 The motor manufacturers have an AEDM  
16 alternate efficiency determination method and they  
17 can basically from a few tests they can determine or  
18 verify this theoretical AEDM and then go to the  
19 Department and get the registration number so I think  
20 it is really pragmatic and if this would be possible  
21 in the fan end as well that would be really great, or  
22 is a lot of like absolute percentage values and then

1 tolerance needed on the fan label in the future.

2 MR. BOSWELL: Ashley did you want to  
3 respond to that?

4 MS. ARMSTRONG: Sure. So I think labeling  
5 is on the table for discussion and what the content  
6 of the label would look like in terms of whether we  
7 do something like motors or whether we do something  
8 for pumps, at least as proposed and ultimately as  
9 proposed -- as voted on by the working group, they  
10 actually wanted numbers.

11 But I think that's up to us. The  
12 Department doesn't have a strong opinion at this  
13 point about what the content of the label should look  
14 like. I think what the Department is still  
15 struggling with though is a more fundamental issue of  
16 scope and at the point of the fan manufacturer how do  
17 you differentiate.

18 So you know we -- I don't know what the  
19 best thing to do at this point is. I don't know if  
20 it's taking a temperature read, I don't know if it's  
21 caucusing -- it seems like we have some specific  
22 groups on different sides at this point and I'm not

1 sure we get further resolution without some  
2 additional information or without some additional  
3 ideas, or without -- I mean that's just my two cents.

4 I have yet to actually make a decision for  
5 the Department. I am not ready to fully vote yet,  
6 but I will entertain additional data and we have been  
7 working on a list of what I think that data might  
8 look like to help inform the decision, happy to  
9 provide that to you today. But like I said I think  
10 what we essentially -- AMCA essentially eluded to was  
11 when we tried to do some of this analysis when we  
12 tried to learn more about the market, the fan market  
13 when we got into a lot of the details we came up with  
14 a lot of questions, some of which are being discussed  
15 today.

16 If you look at the approach that's been  
17 published in the draft NODA it's an operating range  
18 approach, it's not a single point approach, it's not  
19 a foregone conclusion but that is what we have done  
20 to date. Obviously that would be part of the  
21 discussions here but it is a range so a lot of this  
22 stuff I think we have come to -- we have come to a

1 conclusion that it's really hard to definitively  
2 exclude something without some additional information  
3 or without some information to make a good decision  
4 or based upon that.

5 So Diane Jakobs wants to speak.

6 MR. BOSWELL: Okay Diane before I open  
7 this up to you, Bill your card has been up do you  
8 have a comment so let's let Bill give his comment and  
9 then we will have Diane's comment from the web.

10 MR. SMILEY: Bill Smiley, Trane. I've  
11 been trying to comment on all of this stuff for a  
12 while. One of the basic questions I have is how long  
13 did it take AMCA and its members to come up with all  
14 of the data and make all the decisions and judgments  
15 on assumptions, to come up with I think you said  
16 connected load which isn't really -- it's an  
17 indication of what the maximum energy consumption  
18 might be, not necessarily what it really is, but how  
19 long did it take you guys to come up with all of this  
20 stuff, that's a lot of work. Was it two weeks or two  
21 years?

22 MR. SMITH: Yes. We -- this is Wade



1 Smith. We started debating these questions 4 years  
2 ago but the decision to gather data and then analyze  
3 different regulatory schemes against that data base  
4 -- requests went out to the members in early December  
5 and we had answers to I would say I think it was 40  
6 queries against the data base done in the middle of  
7 February so I think specific to your question I had a  
8 data base that I was analyzing three weeks after I  
9 sent out the request.

10 MR. SMILEY: Yeah but from the time you  
11 started to figure out what you were requesting how  
12 long did it take for that? I guess the point I am  
13 trying to make is --

14 MR. SMITH: It didn't take long.

15 MR. SMILEY: A three month assignment here  
16 to define what we are going to do. It appears that  
17 we are going to be wanting to look at data that has  
18 not been generated yet and I wanted to get a feel for  
19 how long it took to generate the data? And it sounds  
20 like it could be anywhere from three years to three  
21 weeks. While I don't believe three weeks is really  
22 long enough for --

1           MR. SMITH: What do you think is  
2 reasonable Bill?

3           MR. SMILEY: Well I don't have any idea  
4 because we haven't really discussed -- it's a  
5 complicated situation. The goal is to reduce energy  
6 consumption but the goal is not to make  
7 super-efficient fans although the premise is that we  
8 are going to reduce energy consumption by making  
9 super-efficient fans right?

10           Well you know we keep telling you that in  
11 applied equipment where you put a fan the  
12 super-efficient fan doesn't always give you the least  
13 energy consumption in overall unit. So you say okay  
14 we need to evaluate that, analyze that, provide some  
15 data, provide some proof.

16           We haven't even started thinking about  
17 that as far as I know. You know it's -- and then the  
18 second part of that is what number do you say we  
19 could improve it to and how do you determine that?  
20 Do you just say well we can improve the efficiency of  
21 our embedded equipment by 3 percentage points and we  
22 are done? You know nobody is going to accept that

1 fan because we don't know.

2           You know it's a very complex situation  
3 it's not as easy as you guys think it is from my  
4 perspective. Now I haven't thought about it a whole  
5 lot, we haven't done any work yet, it may not be  
6 hard, I don't know.

7           MS. ARMSTRONG: We don't have a test  
8 method for it.

9           MR. SMILEY: Well whether we have a test  
10 method or not, we are trying to determine what the  
11 energy consumption of fans is for equipment that use fan  
12 as an integral component, an important component but  
13 not usually the major energy consumer of that product  
14 but it does you know, so I am saying we need time to  
15 figure out what we need to do here and then beyond  
16 that another question is do the fan manufacturers  
17 believe that there are no fans being made today that  
18 are as efficient as they could be and how much more  
19 do you think there would be and are you assuming you  
20 are going to have to redesign every fan you make  
21 based on what we come up with for a requirement.

22           MR. BOSWELL: Okay so can I put --

1 MS. ARMSTRONG: Can I just ask a question  
2 to that end.

3 MR. BOSWELL: Go ahead.

4 MS. ARMSTRONG: I mean to the HVAC  
5 manufacturers, whether it be Bill or Aniruddh, or  
6 Mark in the room, others -- what's the typical  
7 wattage of your fan that you use in furnaces? Or  
8 what's the typical wattage withdrawal of your fan  
9 that you use in your unitary equipment? You can't  
10 tell me that you don't know.

11 MR. SMILEY: 10 watts.

12 MS. ARMSTRONG: Just period. You know the  
13 range off the top of your head. I mean this isn't --  
14 if not can you go ask your engineer, I think that's  
15 something that they would know tomorrow. This isn't  
16 -- I mean we are not looking for -- we are trying to  
17 get order of magnitude here, we are trying to get an  
18 informed decision. That information is not hard to  
19 come by, you design your products around it and  
20 certainly you know what the wattage of your fans are.

21 MS. JAKOBS: This is Diane do I get a  
22 turn?

1           MR. BOSWELL: Yeah you are next in line.  
2 I keep trying to move there so Bill is first so Diane  
3 if you want to go ahead and make your comment and  
4 then people can either respond directly to Ashley. I  
5 I think what would make sense. We have one tent card  
6 up it might make sense to caucus so that people who  
7 have been you know, talking in the group might want  
8 to have a chance to consolidate their thinking and --

9           MS. JAKOBS: Okay but I don't get to  
10 caucus so could I just say one thing?

11          MR. BOSWELL: We are assuming that's going  
12 to be after your comment Diane, I'm just trying to  
13 get a gauge in terms of where we are going to move  
14 after your comment okay. So would doing a caucus  
15 make sense? Okay Diane?

16          MS. JAKOBS: I just wanted to respond.  
17 There was a person I think from the public who asked  
18 about can we use a fan manufacturer, and I work for  
19 Rheem, fan manufacturer data and the way we design  
20 equipment the -- I'm certainly aware of AMCA 210 and  
21 the data that comes from AMCA 210 is not helpful as  
22 we design our equipment.

1           I know when we go, I've looked at fan  
2 selection programs and those are not helpful. They  
3 are -- it's different when we put it in our  
4 equipment, the system effects, what everyone has been  
5 discussing, we  
6 don't look at data from AMCA 210 so that test  
7 procedure is not helpful as these  
8 designs -- as you are trying to get the whole system  
9 efficiency down to meet a certain target.

10           As a practical sense it is just not  
11 helpful. We don't use the selection programs, we  
12 don't use AMCA 210 but I do know that we have Rheem  
13 -- wow that wasn't a plug -- we have a lot of data on  
14 how our equipment runs with the air conditioning, you  
15 know, with a compressor running and the fan, and  
16 that is an indication of the fan efficiency. I don't  
17 know that the -- I don't know that it's not useful  
18 information, that efficient stand, when you are  
19 running the compressor, it's inefficient when you  
20 turn off the compressor and you are just for  
21 ventilation. So thank you for that opportunity to  
22 talk.

1 MR. BOSWELL: Thank you Diane, Wade?

2 MR. SMITH: Well the coverage determination was  
3 issued June 28th, 2011 so the questions that are being asked  
4 here have as much validity for fans embedded in  
5 unregulated equipment as they do in regulated  
6 equipment. There's been four years almost of time  
7 during which manufacturers of equipment that embed  
8 fans have had to engage on this subject.

9 You know and AMCA has given a lot of  
10 encouragement to AHRI and its fan working group to do  
11 just that. So with all due respect Bill you know  
12 it's -- it would be great if those manufacturers  
13 would engage in this process and imagine what they  
14 wanted in the regulation because they know -- the  
15 first reaction of AMCA members, of everybody when  
16 they learn that they are going to be regulated is to  
17 say no.

18 But you have to get past that and say if  
19 we are going to be regulated, then how do we want it  
20 to be structured to maximize the savings and minimize  
21 the impact on us and the answer to that question has  
22 not been forthcoming from the AHRI member companies

1 and that's what is needed. If it takes more time it  
2 would be far better to take the time and engage fully  
3 then it would be to simply say we don't want to be  
4 regulated.

5 MS. JAKOBS: Our fans have been regulated  
6 from the beginning.

7 MR. SMITH: I will repeat what I said.  
8 It's been four years. If the members of the AHRI do  
9 not want to be regulated they need to advance the  
10 arguments which would support that position. One of  
11 those arguments certainly --

12 MS. JAKOBS: I have --

13 MR. SMITH: Excuse me, one of those  
14 arguments certainly has to be what is the connected  
15 load of the fans that we are talking about and  
16 regulated equivalent and unregulated equivalent?  
17 What are the issues, how do we deal with those  
18 issues? How do we want DOE to deal with those  
19 issues? How do we want to be regulated, what would be a  
20 regulation that would make sense to us?

21 Those answers are not forthcoming and  
22 that's what this working group is all about to



1 develop those answers and if it takes more time I for  
2 one would want to ask for the additional time but I  
3 wouldn't come to the table and say we don't want to  
4 do it.

5 MR. BOSWELL: Okay so again I see a couple  
6 of people wanting to speak. I'm also just wanting to  
7 get a sense of where we are. I'm hearing a lot of  
8 responses to one another, I'm not necessarily hearing  
9 that much that is necessarily new to what others have  
10 said so what I am wondering is if we want to take a  
11 temperature check on where people are, I'm not sure  
12 exactly how people want to frame that issue. I defer  
13 to somebody to decide how they want that question  
14 asked, or if it would make sense to break into  
15 sub-groups to have people have a chance to compare  
16 their thoughts and evaluate what they have heard from  
17 others?

18 MS. PETRILLO GROH: I would like to make a  
19 comment on the timeline that was discussed. The  
20 framework document was released in February of 2013  
21 which specifically stated that DOE did not think it  
22 had authority to regulate fans in a regulated

1 product.

2 MS. ARMSTRONG: It did not say that.

3 MS. PETRILLO GROH: That was part of it  
4 actually. In January -- the very beginning of  
5 January of this year during an ex parte meeting is  
6 where DOE backtracked on that previously published  
7 position. So the four years that you are talking  
8 about has been consideration for fans in general  
9 where it looked like fans and stand-alone products  
10 but what we have been talking about here are fans and  
11 regulated products where the product efficiency is  
12 tested and reported and regulated.

13 We are grappling with and are willing to  
14 look at the points that you have raised for data  
15 points of how to measure the fan efficiency of that  
16 product during times that are not -- during equipment  
17 operating hours that are not captured in heating or  
18 cooling mode for five or six different types of  
19 equipment. Thank you.

20 MS. ARMSTRONG: So Wade I think just a  
21 clarification. The framework did not say we did not  
22 have the authority but besides that I think the real

1 question is -- is exactly what we have just said, can  
2 we get away from no and or if we are going to get to  
3 no, we need to do so in a data driven kind of  
4 reasonable basis. So you know, I think that's where  
5 we are so the reality is are the OEM manufacturers  
6 that are around the table willing to come to the  
7 table to come up and work -- come to a workable  
8 solution outside of the answer of no.

9 MR. BOSWELL: Greg Wagner?

10 MR. WAGNER: To get to your question  
11 there's a lot that goes there. Back to my question  
12 about does DOE have data on commercial industrial  
13 fans running time, running hours the statement of  
14 opinion that there is a lot of ventilating hours that  
15 are caught in the heating and cooling mode where the  
16 energy is considered.

17 As Diane just walked through, all the test  
18 methodology, all of the discussion around how to  
19 measure performance of fans was only on stand-alone  
20 fans, not in a manner that anybody at AHRI measures  
21 the equipment that they produced so it was a totally  
22 different method.

1           Their energy that they consume with that  
2 fan is part of the entire systems connected load so  
3 it is accounted for in the entire system's measured  
4 energy use. And depending upon what mode that thing  
5 is operating in it will have different fan energy  
6 versus the rest of the energy. So there isn't a  
7 simple method of saying oh I can go right back to the  
8 database and figure out what kind of fan energy is  
9 being used.

10           And you can't just go by nameplate  
11 rating or other kinds of methods like that to come up  
12 with an answer because those are representative of a  
13 point of operation that may or may not be where that  
14 thing is operated in that unit. So the question of  
15 how to get that data is a rather complex one and it  
16 would involve a great deal of time to measure all of  
17 those things because it is not in the format that  
18 this rulemaking was originally structured and has  
19 been talked about from the day one.

20           Being a fan manufacturer I am used to  
21 looking at AMCA 210 data and looking at AMCA 210 type  
22 of testing and putting together programs working with

1 customers to help them reduce energy consumption, but  
2 that doesn't mean that it looks at how you would  
3 measure for this particular operation, this  
4 particular outcome and that's why covered products  
5 are different than just stand-alone fans. They have  
6 a different kind of method of valuing that energy  
7 consumption.

8 MR. BOSWELL: Okay Meg?

9 MS. WALTNER: Meg Waltner from NRDC.

10 Ashley I thought I heard you say earlier that you had  
11 been working on a list of the type of data that you  
12 might need and I'm wondering if whether going over  
13 that list before caucus might be a productive thing  
14 to do at this point.

15 It seems to me that there are maybe  
16 different levels of data that you would need over the  
17 course of the analysis from sort of the most basic --  
18 just getting an estimate of connected load so we  
19 understand how big of an issue we are talking about  
20 here and then you know more granular data of  
21 efficiency levels and market share of those  
22 efficiency levels, et cetera that might take longer

1 to collect but it seems like that just connected  
2 load question is a big one from our perspective.

3 MR. SMILEY: Why do we keep saying  
4 connected load, because that is not real world what's  
5 considered, that's maximum that might -- I'm sorry  
6 this is Bill Smiley, Trane. We always keep talking  
7 about connected load which is the maximum energy or  
8 power that piece of equipment might consume but that  
9 is never where the operator or very rarely do they  
10 operate at that point.

11 So if you just evaluate connected load  
12 you are way over estimating the energy consumption.

13 MR. SMITH: So do something else.

14 MR. SMILEY: Yes do something else. You  
15 know we have to do something else. Say consumed load  
16 not connected load.

17 MR. FERSTROM: Folks this is Gary. I  
18 would like to follow on to Meg's point. Ideally we  
19 would like to know the energy use and there's a lot  
20 of debate going on around how we measure that given  
21 the different operating conditions of this equipment.  
22 At a minimum if we knew the connected load at least

1 we would have an idea what the maximum size of the  
2 market was.

3 I don't disagree, I do agree that this  
4 equipment doesn't operate all the time at nameplate  
5 conditions so connected load is an over statement in a lot of  
6 ways but we don't know anything now and if we at  
7 least knew the connected load we might have a  
8 marginal handle on what the size of the market and  
9 opportunity is.

10 MR. BOSWELL: Laura? Joanna?

11 MS. MAUER: It seems like one of the  
12 questions here is related to the definition of what a  
13 fan is. It sounds like one of the concerns that has  
14 been raised is the OEM is buying just an impeller and  
15 the fan actually can't be tested because it is not a  
16 fan until the product is assembled.

17 In those situations I guess depending on  
18 whether the OEM is considered to be a manufacturer of  
19 that fan would seem to have an impact on this  
20 discussion and I don't know if that's a question that  
21 we can answer or have some discussion about now. So  
22 for that particular case of where it's not a fan

1 until it is part of a piece of equipment and  
2 therefore never being sold as a stand-alone fan.

3 MS. ARMSTRONG: So I don't know that I can  
4 specifically answer that question directly at least  
5 yet. I think what DOE is grappling with is the idea  
6 that manufacturers are situated differently. Some  
7 may produce impellers themselves, some may import  
8 impellers, some may import what I am calling the fan  
9 which is the impeller and the housing and the  
10 associated components there and some may -- I think  
11 what DOE struggles with is it is going to have to  
12 provide an equitable regulation irrespective of how  
13 that manufacturer is situated.

14 So what you are hearing from the  
15 Department is while Greg I think that's absolutely  
16 fantastic that on a second-by-second basis you can  
17 track everything in your company, that's really helpful  
18 and that would be helpful to the Department. I don't  
19 think everyone is situated the same as you.

20 I think what we are asking you for is  
21 something other than a self-declared method. To get  
22 to Meg's point about what data you know DOE said you



1 were working on a list and we have kind of been  
2 trying to work on a list over here but at a high  
3 level this doesn't just inform the decisions -- I  
4 think we are talking about you know a list of OEM  
5 equipment incorporating fans.

6           What's regulated, what's not -- not all of  
7 it is regulated. And the same type of fans go into  
8 regulated and unregulated equipment. How do you tell  
9 the difference? How do you know if a box of  
10 impellers is coming in -- if it's ultimately going to  
11 be regulated or unregulated?

12           Typical fan shaft input power at a typical  
13 operating point range, or an operating point of the  
14 equipment. It's close enough. It doesn't have to be  
15 a test procedure. The test procedure we will get to,  
16 right? We are just trying to understand impact  
17 right? Are we talking 10, are we talking 1  
18 horsepower, where are we? Give us a range and units  
19 sold per year. It's really that simple and I think  
20 that as an OEM you can go with that. You know your  
21 business and you would know that tomorrow.

22           Now I get that at an aggregation level you

1 may not want to share that information tomorrow but  
2 this isn't an unreasonable ask to help provide the  
3 Committee with some data to help inform the decision  
4 and I think that's you know, as a Committee it's our  
5 due diligence to make informed decisions.

6 MR. BOSWELL: Greg?

7 MR. WAGNER: One this is getting energy  
8 consumption is totally different. As you well know  
9 run time affects dramatically what that energy  
10 consumption is. As I have said earlier, DOE has done  
11 excellent work, has great data from their REC's  
12 analysis of the energy consumption of residences and  
13 that's very detailed and you can break it down into  
14 region and whatever and you can figure out by product  
15 pretty much how much energy is being consumed.

16 Is there any such thing for commercial?  
17 Because that's where it would have to start to figure  
18 out what is the energy consumption of anything. Now  
19 what the manufacturers don't have is the exact energy  
20 consumption of the fan because they look at what the  
21 energy consumption of the unit is as a whole and  
22 that's how they put together their plans.

1           I don't know how you know you get to that  
2 measurement point but that is certainly something  
3 that would need to be worked through to come up with  
4 what some energy savings would be, but just looking  
5 at nameplate ratings isn't going to get you.

6           MS. ARMSTRONG: I think that's fair but we  
7 are trying to get a picture of the market so perhaps  
8 maybe if you didn't like my three bullets of data,  
9 what do you have that could help inform this decision  
10 easily? Instead of no, what gets us to yes?  
11 What is your alternative solution? Because that was  
12 one of the things we talked about in day one, that if  
13 I am going to say no to something I would have an  
14 alternative solution so if you don't have that or you  
15 don't think that's the right set of data, I mean to  
16 answer specific questions, there is a commercial  
17 building survey that EIA does similar to residential,  
18 that's there.

19           MR. WAGNER: Is it broke up by equipment?

20           MS. ARMSTRONG: It's not -- yeah, by  
21 application. It's not as I would say granular maybe  
22 as RECS but yes, generally speaking we use it in

1 commercial analysis and it has some information. We  
2 had to do that type of analyses for both the  
3 commercial HVAC rule but also --

4 MR. WAGNER: (Off mic).

5 MS. ARMSTRONG: Yeah but I'm not the one  
6 trying to make the case that I shouldn't be included.

7 MR. SMITH: In the data that we provided  
8 the DOE, we have no idea about the operating hours of  
9 the fans I mean -- we are manufacturers of fans. And  
10 so when we sat down to take that data and extend it  
11 to determining what the terawatt hours were of  
12 consumption right -- we had to answer the question  
13 what are the operating hours and at what load point?

14 And the best among us no answers -- so we  
15 went to the DOE published data and pulled some of  
16 that information and did those calculations ourselves  
17 with their data but when we submitted the data to the  
18 DOE we didn't submit that data, we submitted the data  
19 that we had.

20 What do we have that could inform the  
21 debate becomes the question and we have something --  
22 we have a lot. If you sit down and you think about

1 that long enough you will come up with a long list of  
2 things that you do have which can be used to inform  
3 the debate and that's what Ashley is suggesting,  
4 don't tell me what you don't have, tell me what you  
5 do have that would help to inform the debate.

6 MR. BOSWELL: Mike?

7 MR. WOLF: Ashley, would you mind being a  
8 scribe at the board there for us. I'm just going to  
9 throw out a thought here. If we go back -- and what  
10 is your opening slide on your slide deck there?

11 MS. ARMSTRONG: This one?

12 MR. WOLF: No the next one.

13 MS. ARMSTRONG: This one?

14 MR. WOLF: No, opening the cover. So  
15 ASRAC Fan Working Group, we have spent I don't know  
16 how many hours this morning and I can't tell you how  
17 many hours I have spent personally discussing what we  
18 have been discussing here and what we are discussing  
19 isn't even on that -- picture on that slide.

20 So what I would suggest -- propose, if you  
21 wouldn't mind going to the white board here is to  
22 maybe refocus the discussion here and bucketed in

1 three areas. First of all let's talk about  
2 stand-alone fans, ones that are on that picture right  
3 there. Because that apparently is kind of important,  
4 it got put on the cover of the slide deck and  
5 underneath that particular topic and this is going to  
6 be you know, let's figure out what the scope is,  
7 what's the definition for fans that are stand-alone,  
8 let's figure out what the load is, whether it is  
9 connect -- we don't want to use the word connected,  
10 what was the word you used Bill?

11 MR. Smith: Absorbed.

12 MR. WOLF: Absorbed or consumed load, can  
13 we -- no, okay so load is probably good in general  
14 terms, what data do we have or do we need to get on  
15 -- I guess we could leave that as a broad subject too  
16 -- what's the metric we want to use and lastly what's  
17 the test method we want to use?

18 And I would propose, so we have got that  
19 for stand-alone fans. The next group that we might  
20 want to talk about and have those same sub-topics  
21 would be you know if we can't get to any consensus on  
22 regulated fans, how about we talk about unregulated

1 fans? Unregulated product, I'm sorry -- thank you.  
2 And my guess is if we can get through discussion of  
3 unregulated product, a lot of the same discussions  
4 that you know things have happened there, which  
5 people shouldn't be threatened by because I think  
6 everybody in the room will say, boy we can't have  
7 that loophole, we have got to do something with  
8 unregulated products because those guys are getting  
9 off free.

10 And if we can get through that discussion,  
11 maybe that will help us in the final discussion which  
12 we are having right now on regulated products.

13 MR. WOLF: This is Mike Wolf, Greenheck  
14 for the record, this is a joke, you know you made  
15 reference to the schoolyard and I said oh I'm the  
16 biggest guy in the schoolyard.

17 MR. BOSWELL: Okay.

18 MR. WOLF: So I'm sorry so my proposal  
19 would be let's take the group's temperature on what I  
20 just said.

21 MR. BOSWELL: Okay, so does this make  
22 sense to take -- I guess Ashley you were scribing

1 that, did you have any thoughts on that process  
2 before we take a temperature check on this?

3 MS. ARMSTRONG: So I think that's a great  
4 start. My ask would be by the time that we get to  
5 number three that people use their due diligence and  
6 collect data on the meantime while we work through  
7 one and two.

8 MS. MAUER: This is Joanna. I don't have  
9 a problem with this. My observation would just be  
10 that I think part of the challenge is that we can't  
11 necessarily define what's in the three buckets but  
12 I'm fine with starting with this.

13 MR. BOSWELL: Duane you have been waiting  
14 to speak?

15 MR. DADDIS: My point would have made  
16 sense about thirty minutes ago.

17 MR. HAUER: Armin Hauer, ebm-papst. I  
18 like Mike Wolf's approach very much however the  
19 picture that is shown here also includes power roof  
20 ventilators, and the power roof ventilators I would  
21 consider are unregulated products that have fans  
22 inside.



1           MR. WOLF: That could be argued for every  
2 item on there and that's why I think if we can't get  
3 past this first item, this other discussion we'll  
4 never get there, so that was my reason for starting  
5 here because we are going to have that same  
6 discussion on what's an embedded fan, what's not an  
7 embedded fan, even on the most simple product that  
8 you have got on the screen up there.

9           MR. BOSWELL: Okay Meg?

10          MS. WALTNER: Yeah so to Ashley's point,  
11 this is Meg, you know I am comfortable with this sort  
12 of sequence of events too but I would really like to  
13 start collecting the data now and to leave today with  
14 a sort of clear idea of what is going to be collected  
15 and provided to DOE in terms of both non-regulated  
16 and regulated products so that we have that  
17 information when we get there.

18          MR. BOSWELL: Okay and I guess just kind  
19 of an observation, with respect to that I understand  
20 the sequencing that is being proposed but one of the  
21 debates that I have been hearing today, this is kind  
22 of your discussion is with respect to embedded

1 products, what data if any does exist and what would  
2 be required to define what data might be useful so my  
3 only concern is that people might want to think  
4 about, I think is piggy-backed here on Meg's comment  
5 which is we start kind of a sequential discussion to  
6 make sure that since we have three months that people  
7 thought about what they need in order to finish the  
8 discussion within three months and that's just  
9 something I think the group wants to think about.

10 MR. WOLF: Mike Wolfe, Greenheck. If I  
11 could comment what I would propose maybe instead of  
12 doing this sequentially we have enough people here,  
13 and the more people that we have the less that we  
14 will get done. Maybe what we do is we cone off and  
15 we break up, you know, maybe we use sorry I keep  
16 forgetting names here -- Mr. no, next to Greg, Gary,  
17 sorry I knew it was something with a "G", Gary maybe  
18 we use your picture from lunch yesterday and we start  
19 out with that and we divide everybody you know  
20 equally amongst those three groups and we break.

21 Now what time is it, it is 11 o'clock,  
22 11:30 I mean, this might be a good lunch topic even

1 you know, if we break into three groups or maybe I'm  
2 going to -- what time do you finish today? 3 or 5?

3 MS. ARMSTRONG: People are leaving  
4 starting around 3, so probably 3.

5 MR. WOLF: Okay well I guess I'm wondering  
6 if we could break from now until 1 or 1:30 into three  
7 groups, small groups, and come back with -- okay if  
8 we have got something we want to get out of you know,  
9 let's say number 3, we need data. Define what that  
10 data is, come back and say 1:30-2 o'clock and say all  
11 right here is what we need, here's what we know but  
12 here's what we need.

13 So at least and at some point today we are  
14 given some clear assignments on what needs to be  
15 collected or clear on what we already have, because I  
16 agree, if we go sequentially yeah -- so just a  
17 proposal.

18 MR. BOSWELL: Wade?

19 MR. SMITH: Yeah I might suggest that if  
20 -- this is Wade Smith. I might suggest that even  
21 today right -- if we could get the number of units  
22 sold by unit size that have embedded fans and I don't

1 know if the group is okay with this but any analysis  
2 that we have done has always been focused on one  
3 horsepower and larger and that eliminates a lot of  
4 work because it takes some of the product categories  
5 that I know people are concerned about off the table.

6           If you know the number of units that ship  
7 by size you know it's not an unreasonable thing to  
8 assign a connected load for the fan in each unit size  
9 and it's you know, it's five minute math to figure  
10 out, hey on this basis which is inaccurate as Mark  
11 will point out -- on this inaccurate basis you know,  
12 how big is this market and I unfortunately won't be  
13 here this afternoon but it would be great if that  
14 would -- if at least that information could come  
15 forth so if it is discovered that this is a trivial  
16 market segment and not worth worrying about then we  
17 can determine that.

18           MR. WOLF: I guess Wade the question that  
19 I would have there is you know, what's the definition  
20 of size -- are you looking by horsepower, by  
21 diameter?

22           MR. SMITH: Yeah I mean however the data

1 exists. So the data exists for unitary product by  
2 unit size described as number of tons. For air  
3 handlers, again I am sure that there are some  
4 breakdown by size, I don't know how it's described in  
5 the AHRI statistics but however it is is what it is.

6 MR. WOLF: Mike Wolf, Greenheck. I'm  
7 sorry but I'm anticipating that same discussion is  
8 going to come on the first one -- stand-alone fans  
9 and if you are leaving at noon I don't think any of  
10 the rest of us understand that spreadsheet well  
11 enough to extract it without your help.

12 MR. SMITH: Well I'll just say for the  
13 stand-alone fans we provided the data that DOE has, I  
14 don't think there's any mystery and to the extent  
15 that it is in the public domain we would be happy to  
16 reveal it.

17 MR. BOSWELL: Mark?

18 MR. FLY: Many of the products in category  
19 3 have multiple fans in there. Multiple fan types,  
20 so let's just take a packaged piece of equipment for  
21 example. At the minimum it is going to have supply  
22 fans, it is going to have condenser fans. Supply

1 fans, as Gary has pointed out will run in event mode.  
2 Condenser fans will never run in event mode so you  
3 know the condenser fans are tied to the refrigeration  
4 system, will always be measured in the refrigeration  
5 efficiency.

6 Yes there is part of the supply fan part.  
7 You add energy recovery, you could add two more fans  
8 in there so there's -- you know it's -- like you said  
9 it's a very, very complex process you know, Ashley,  
10 you know my 510 unit I offer half horsepower to 2  
11 horsepower fans. Now, do I average the two? Say  
12 it's a horse and a half or two? It's not data we --  
13 it's data that I can dig out from my company. It is  
14 certainly not data that I report to AHRI.

15 AHRI has fairly good data for at least  
16 unitary equipment on 10 inch and number of units in  
17 the market and I don't really know what we have got  
18 on air handlers and many of the other product classes  
19 so yes I think maybe one of the first steps is to  
20 start listing equipment that have fans in them. It's  
21 many but at least that gives us a scope of the  
22 problem.

1           MR. SMITH: Mark I think it would be a  
2 much easier or diminished task if you focused on one  
3 horsepower and up only because that would eliminate  
4 the condenser fans that you are talking about for the  
5 most part. Not to say that there aren't some  
6 condenser fans that are drawing more than one  
7 horsepower but it is not as prevalent.

8           And I mean you know, I think the group is  
9 looking for the best data that is available and  
10 whatever it is, it is. You know, it's better than no  
11 data right which is what we have got now.

12           MR. FLY: Well is DOE okay with  
13 eliminating everything under one horsepower?

14           MS. ARMSTRONG: I would say DOE is as a  
15 temperature check much more open to that than  
16 regulated equipment as a whole, let's put it that  
17 way, so you could strike a deal with that.

18           MR. BOSWELL: Okay how about --

19           MS. ARMSTRONG: Like I said you are asking  
20 -- show me why, show me data, what does that mean?  
21 What does one horsepower mean, what does two  
22 horsepower get you, that's what I asked from the

1     outset. Make your case. Make your case to this  
2     Committee as to why, not just no.

3                   MR. BOSWELL: Okay.

4                   MR. SMITH: And I should say on  
5     stand-alone fans where we gather the data, we gather  
6     the data down to 1/8th horsepower and made a case  
7     that below one, as I described earlier, the impact  
8     and our member companies in terms of their investment  
9     was very, very great. 85% of the fans that are in  
10    our data base are below one horsepower, but only 20%  
11    of the connected load.

12                   So 85 we are going to invest in redesigns,  
13    that's a lot of product to redesign but the benefit  
14    is dramatically diminished so you have got an 80/20  
15    rule if you are working in real life and so by  
16    focusing on the fans that are one horsepower and  
17    greater it just -- you get more bang for the buck.

18                   Somebody asked, Laura asked yesterday what  
19    was one horsepower because that's -- we drew the line  
20    at one horsepower and above, not above one horsepower  
21    right? And so the AMCA members debated that question  
22    for a long time. There's a -- it turns out there is



1 a lot of connective load in the one horsepower group  
2 and in the debate we felt that if we can come to  
3 reasonable efficiency levels as the regulatory  
4 requirement then we would go down to and include one  
5 horsepower, but it was -- I should say something here  
6 that in our consensus with the advocates that we put  
7 in the public domain with the noted response you  
8 know, we didn't document any consensus and actually  
9 there is not a consensus about what the regulatory  
10 requirement ought to be.

11 AMCA made a proposal, it was not accepted  
12 so you know if the regulatory requirement causes us  
13 to invest a lot more time, energy, money, capital in  
14 redesigns than we would anticipate we might come back  
15 and argue for something above one horsepower because  
16 we are most sensitive to the impact to our small  
17 business member companies and we don't want to put  
18 them out of business.

19 And so, you know, the debate inside is  
20 Carnes Company, you know are you okay with this? And  
21 they express themselves and from their expression of  
22 concern in what was acceptable and unacceptable we

1 derived our bargaining authority and that's what we  
2 are here to exercise.

3           So all of these things are malleable  
4 right? It could go up, it could go down, the  
5 standard could go up or it could go down, who knows.  
6 But it's hard to evaluate the impact, the savings,  
7 it's not possible to make informed decisions for the  
8 advocates or for the manufacturers if you don't have  
9 the raw fodder to work with and just so at a high  
10 level if you just had unit counts, shipped and could  
11 assign what you think is a representative horsepower  
12 for the fan, that's going to tell you how big the  
13 connected load is and after you get DOE's operating  
14 hours, you know you might actually calculate what the  
15 energy cost is.

16           MR. BOSWELL: Okay so Greg?

17           MR. WAGNER: This is Greg Wagner again,  
18 one of the things that is not on that list and I  
19 don't know where you would put that is other fans for  
20 example, construction equipment, vacuum cleaners,  
21 material handling, aerospace, there's a wide range of  
22 fans that go into other products and I don't see any

1 representation here at these meetings or a discussion  
2 about how that fits into this framework because they  
3 certainly would come under the broad definition that  
4 has been put forth and I have just listed some of the  
5 ones that are out there.

6 MR. BOSWELL: Gary?

7 MR. FERSTROM: I have a question for Wade.  
8 If I understood you right you made the point that  
9 small fans while large in number represent a smaller  
10 part of the connected load, is that correct?

11 MR. SMITH: It -- for stand-alone fans,  
12 that's definitely the case yes.

13 MR. FERSTROM: Okay so I was thinking  
14 about the unitary equipment and the hours of  
15 operation and might not we speculate that small fans  
16 could potentially have a lot higher hours of  
17 operation than the larger ones?

18 MR. SMITH: No.

19 MR. FERSTROM: Okay thank you.

20 MS. PETRILLO GROH: I have a question for  
21 Wade as well on the database of fans, this is Laura  
22 Petrillo from AHRI -- you said 85% of the fans in the

1 database was below 1 horsepower?

2 MR. SMITH: That's correct.

3 MS. PETRILLO GROH: And approximately 12%  
4 of the fans were one horsepower?

5 MR. SMITH: No I think it's approximately  
6 12% of the connected load is at one horsepower.

7 MS. PETRILLO GROH: Thank you.

8 MR. BOSWELL: So I want to go back to when  
9 Mike was speaking he actually made a proposal and  
10 asked that we took a temperature check on that which  
11 would be to self-divide into three groups, take a two  
12 hour lunch break, reconvene after that during that  
13 two hour break those three groups could meet and  
14 report back on kind of potential next steps under  
15 these three headings. So is that still what people  
16 would think of as a good proposal after the  
17 subsequent discussion that has taken place?

18 MR. WAGNER: (Off mic).

19 MS. ARMSTRONG: I don't think the  
20 Department has an opinion about -- has voiced an  
21 opinion yet, we usually have opinions but -- at least  
22 me -- so I have a question just for Mike and maybe

1 this is my naive you know, this will show my lack of  
2 expertise in the fan industry but with number one as  
3 soon as you get the scope and definitions, aren't we  
4 having the same conversation?

5 MR. WOLF: Yes we are but it should be  
6 much simpler, simpler discussion and my hope is that  
7 if we can get through the simple discussion that  
8 might help us with the more complex discussions we  
9 are having here.

10 MS. ARMSTRONG: So my suggestion would be  
11 to do break outs, you know, at least around number  
12 one if you guys want to come back with a proposal of  
13 what that scope -- the scope and definitions look  
14 like. We have some slides that might help you with  
15 that.

16 But I think the group needs to have that  
17 discussion before we put too much time into two and  
18 three. Definitely I think the data should -- people  
19 should start collecting data but I'm not so sure the  
20 scope and definitions isn't going to turn into the  
21 same discussion we are having now because what DOE  
22 found at least when it looked at the different

1 categories of fans was if you are looking at the  
2 category of just the fan, you know this fan -- all  
3 three of those and that's what we are struggling  
4 with.

5 MR. WOLF: Mike Wolf again, I'm fine with  
6 that I just threw it out there.

7 MS. ARMSTRONG: No I think that's great.

8 MR. BOSWELL: Wade?

9 MR. SMITH: So I'll toss out a soft ball  
10 or as they said a fast ball right across the middle  
11 of the plate. I think this working group should not  
12 change the fan definition but should change the scope  
13 of the -- should propose the scope of the regulation  
14 not include well should include only fans driven by  
15 an electric motor, rather than fans driven by some  
16 other means which takes a lot of -- I'll call it the  
17 oddball stuff, you know like a propeller fan in the  
18 front end of my car is a fan but it is not connected  
19 to the grid, so maybe the better thing to say is that  
20 we should only be dealing here in this regulation  
21 with grid connected fans.

22 MR. FERSTROM: So we touched -- this is

1 Gary, we touched on this issue yesterday a little bit  
2 and I encouraged the group to consider utility  
3 connected fans which would be those driven by  
4 utilities supplied grid electricity or pipeline gas.

5 MR. BOSWELL: Okay I guess a question I  
6 have for Ashley from your comments, are those things  
7 that you think you would like to go over from the  
8 slides that DOE prepared that you started to before  
9 -- no? So Meg you had a comment?

10 MS. WALTNER: Yeah I just did in response  
11 to Wade's point you know that saying the think I want  
12 to think about there is how do we differentiate those  
13 fans when you, you know, when Ashley goes to enforce  
14 the regulation is there a way to tell the difference  
15 just by picking the fan up off the shelf?

16 MR. SMITH: Yes.

17 MS. WALTNER: Okay so that's something  
18 that we would need to work through.

19 MR. BOSWELL: Gary did you have another  
20 comment? So I know that Greg has an issue about  
21 this list, Ashley's raised the point about whether or  
22 not one doesn't the others -- I think there's still a

1 question about or some value is being expressed for  
2 people having a two hour period to have lunch, caucus  
3 amongst themselves and reconvene on these issues, so  
4 why don't we take -- yes Dan?

5 MR. HARTLEIN: I think, I mean did we  
6 actually take a temperature on that because I'm not  
7 sure --

8 MR. BOSWELL: That's what I was about to  
9 say.

10 MR. HARTLEIN: Okay because for me we are  
11 here and we are not together, we can caucus tonight,  
12 tomorrow, so that would be my opinion is it -- that  
13 extended hour for lunch, you know, we are going to  
14 have to deal with these issues as a group at some  
15 point.

16 MR. BOSWELL: Armin?

17 MR. HAUER: Armin Hauer. I have a  
18 procedural question. When did we decide that we stop  
19 the meeting at 3 o'clock? We had talked about  
20 earlier about minimizing costs and impact on  
21 manufacturers, some of us have made arrangements to  
22 be here until 5 o'clock today and I would have no use



1 my time until my flight leaves tonight at 11 P.M.

2 MS. ARMSTRONG: So we can definitely go  
3 until 5, I'm going to be here too. It's -- I know  
4 that there is a couple of people that mentioned to me  
5 that they are leaving before 5 but we can keep going.  
6 That's a non-issue. I don't think we are going to be  
7 voting on anything this afternoon. In case anybody  
8 was worried about that, just to address it up front.

9 MR. BOSWELL: Okay Meg?

10 MS. WALTNER: Another procedural question  
11 do we need a quorum to proceed with the meeting at  
12 all after people leave and so many we should get a  
13 clear number of who is leaving.

14 MR. BOSWELL: We need a quorum to meet.

15 MS. ARMSTRONG: (Off mic).

16 MR. BOSWELL: I was going to say if we  
17 have less than a quorum -- if we have less than a  
18 quorum and the group decided to meet it could be a  
19 subgroup of the Committee but I think from the list  
20 that I have seen of people that have indicated to us  
21 that they are leaving at various times this  
22 afternoon, I think that we will probably still have a

1 quorum.

2 Those that haven't specified anything will  
3 be here until 5.

4 MR. SMITH: This is Wade, do I understand  
5 from the sort of by-laws that we established  
6 yesterday that a subgroup can be no more than 15  
7 people?

8 MS. ARMSTRONG: We would have two. Good  
9 thing we have three categories up there. Can I make  
10 an ask? Let's do this, let's break for lunch. Let's  
11 reconvene though in about an hour, maybe an hour and  
12 fifteen if you want more time, but I'm happy to  
13 tackle number one first, let's talk about number one,  
14 let's talk about scope, let's talk about what those  
15 definitions might look like that are definitely in  
16 and see where it goes. Is that okay with everyone?

17 MR. BOSWELL: Okay.

18 MR. ROY: Aniruddh Roy with Goodman. I  
19 would propose that we abstain from voting on any of  
20 those until all three are addressed though because  
21 there could be implications on category 3 based on  
22 the decisions that are made in category 1.

1 MS. ARMSTRONG: Completely, honestly I  
2 don't think anyone is going to be in a position to  
3 vote today anyway.

4 MR. ROY: Thanks.

5 MS. ARMSTRONG: I mean I think that's just  
6 the reality of where we are going to be.

7 MR. BOSWELL: Okay, any objection to  
8 taking a break at this point and reconvening in --  
9 it's 11:50 why don't we reconvene at 1 o'clock.

10 MS. ARMSTRONG: All right so we want to  
11 start back up from lunch. All right.

12 MR. BOSWELL: Okay so as we get started,  
13 Wade Smith has left and his alternate has joined us  
14 at the table, so I am just going to ask him for the  
15 record to introduce himself so that we have that.

16 MR. CATANIA: Yes thank you very much.  
17 This is Tom Catania, I'm a consultant to AMCA. I  
18 probably will sort of just expand a little bit on my  
19 introductory background from when I was in the  
20 audience just for purposes that people don't know me.  
21 I am a retired vice-president of government relations  
22 for the Whirlpool Corporation so I participated in

1 many, many years of standards -- appliance standards  
2 negotiations so this is not entirely foreign  
3 territory to me.

4 MR. BOSWELL: Okay thank you. I don't  
5 think there is any other changes around the table.  
6 So I guess I would turn this to you Ashley to get us  
7 started.

8 MS. ARMSTRONG: So I think one of the  
9 things that we -- we talked about doing before we  
10 left is to let's talk about a subset. Let's try to  
11 start with the smallest and see if we can kind of  
12 build from there in terms of getting agreement for  
13 some of the fans. So we are going to go to specifics  
14 and we are going to talk about what we call the  
15 stand-alone category and I am going to get some help  
16 from an expert in the industry and we are going to go  
17 from there.

18 MR. WOLF: You say I'm an expert?

19 MS. ARMSTRONG: That's you. Do you want  
20 to start with a specific one?

21 MR. WOLF: Go to your next slide I think  
22 that the one where you have ducted?

1 MS. ARMSTRONG: This one?

2 MR. WOLF: Yeah.

3 MS. ARMSTRONG: Okay.

4 MR. WOLF: So if I remember -- so this is  
5 Mike Wolf, Greenheck. I think this came right out of  
6 the NODA did it not?

7 MS. ARMSTRONG: It did.

8 MR. WOLF: So these are the definitions  
9 that we are using as a baseline for discussion so I  
10 think what I propose is that we start here and then  
11 you know if we don't like it propose changes or  
12 improvements, okay?

13 So looking at this list, I think the  
14 simplest one is probably going to be housed  
15 centrifugal backward bladed fan. I am hoping that we  
16 can maybe get some consensus around that. So if we  
17 go to the you know the flip chart there and we start  
18 with the scope and definition, Ashley you have got  
19 some other slides that I kind of peeked -- if we talk  
20 about a housed centrifugal backward bladed fan,  
21 what's the scope and definition for that product, do  
22 you have anything else we can reference, somebody had

1 here a couple of slides.

2 MS. ARMSTRONG: I don't know if we have a  
3 specific definition for just that one. We have a  
4 definition for centrifugal fans.

5 MR. WOLF: Okay so.

6 MS. ARMSTRONG: So if we want to make it  
7 more specific we could you know, we could go there or  
8 are all centrifugal fans ultimately?

9 MR. WOLF: And that's a good question so  
10 here's what I would like to do or give some  
11 consideration to is trying to develop some sort of a  
12 process where we can go through each of these and say  
13 all right what is it, what things do we know, what do  
14 we not know? So if we start with the definition and  
15 I just cut and pasted the definition you had there so  
16 that's a centrifugal fan and I don't know if we need  
17 to maybe add a category over here then that might  
18 reference back to this to say well all right which  
19 one is it, okay.

20 So I think it would be pretty easy -- oh  
21 I'm sorry -- okay. So again guys, I'm just throwing  
22 this out there as a way to work out a way to this

1 problem. You know I think we could say that a  
2 centrifugal fan, housed centrifugal backward bladed  
3 fan would fall under that definition. Can we take a  
4 temperature on that? Steve?

5 MR. DIKEMAN: How are you trying to  
6 approach this, Steve Kikeman. How are you trying to  
7 approach this Mike because if you get the last  
8 sentence with or without a housing now we have jumped  
9 from centrifugal in total into the four subsets that  
10 you have got on the other page. So do we have one  
11 definition for each of the fans if this happened to  
12 be a backward curve that would say backward curve it  
13 has a housing?

14 MR. WOLF: I guess I could pull a line out  
15 of Ashley's repertoire, what do you want?

16 MR. DIKEMAN: No, I'm trying to anticipate  
17 where you are headed. Centrifugal fan covers things  
18 in both columns three in one column, one in the  
19 other, the housing captures all of that so at what  
20 point do you -- define what --

21 MR. WOLF: Right.

22 MS. ASHLEY: So you just mean why the

1 housing is not necessary?

2 MR. DIKEMAN: No, why it is.

3 MR. WOLF: Well I think let's not jump to  
4 conclusions, let's work through the process. So the  
5 answer to your question I would propose, well say the  
6 question again?

7 MR. DIKEMAN: Your question was about this  
8 definition versus what is -- four categories we just  
9 talked about in two columns.

10 MR. WOLF: So what I would suggest Steve  
11 is we take this definition of a centrifugal  
12 fan and we plug in which of those categories fits  
13 into this definition that would be my proposal.

14 MR. DIKEMAN: Okay, okay, no, that's what  
15 I was trying to get with you on. So there are there  
16 that would fall into that particular --

17 MR. WOLF: Into this.

18 MR. DIKEMAN: That particular -- right am  
19 I with you Mike?

20 MR. WOLF: Yes.

21 MS. ARMSTRONG: The three on the --  
22 (indicating slides)



1 MR. DIKEMAN: Just those three.

2 MR. WOLF: Well you have got a centrifugal  
3 inline too that's in there.

4 MR. DIKEMAN: You would, yep.

5 MS. ARMSTRONG: Well how about we go back  
6 and look for a second at these, not that one.

7 MR. WOLF: So I would say that there is  
8 four on that left-hand side.

9 MR. DIKEMAN: My bad.

10 MR. WOLF: Yep, we will let it go this  
11 time.

12 MR. HARTLEIN: Yeah, Dan Hartlein, Twin  
13 City Fan. The question I have I think you are seeing  
14 with or without a housing on the next slide right?

15 MS. ARMSTRONG: Yes.

16 MR. HARTLEIN: But everything you have  
17 written here says housed.

18 MS. ARMSTRONG: There is one, there's a  
19 right side.

20 MR. WOLF: Okay so what I would propose  
21 there is we create maybe two columns or two headings  
22 here under examples or categories, whatever we want

1 to call it, we say okay what are the ducted examples  
2 or categories and what are the un-ducted, that way we  
3 get everything pigeon-holed right away here because I  
4 have identified a number of other holes with this but  
5 I don't want to go there right away, I would like to  
6 get some consensus and get us down the path a little  
7 further before I start shooting holes in my own plan  
8 here.

9 So again to take a temperature does that  
10 seem reasonable to everybody?

11 MR. DIKEMAN: (Off mic) We have got the  
12 housing, with or without housing, so --

13 MR. WOLF: That was Steve Dikeman.

14 MS. ARMSTRONG: Okay so let's talk about  
15 the examples. Does everyone agree with the examples?

16 MR. FLY: This is Mark Fly with AAON. I  
17 don't think -- I think the point that he is making is  
18 not inclusive because it says with or without a  
19 housing so you have to have the unhoused centrifugal  
20 fans in that also.

21 MS. ARMSTRONG: And --

22 MR. FLY: If you are going to go directly

1 by the definition that's up there on centrifugal fan  
2 without altering.

3 MR. WOLF: Okay so Mike Wolf, would you  
4 rather change the definition or --

5 MR. FLY: I would rather change the  
6 definition because I think we are going to run into  
7 characteristics that need to be separated.

8 MR. WOLF: So what is everybody's  
9 temperature on that, do we want to start with  
10 changing the definition here? Okay I am going to  
11 take general head nods as yes. So somebody make a  
12 proposal on what should or should not be in that  
13 definition.

14 MR. FLY: I would change the last line to  
15 say the impeller may -- I shouldn't say shall have a  
16 housing component, or one or two inlets with a  
17 housing component I think is what we need to say.

18 MS. ARMSTRONG: Go ahead you can just  
19 talk, it's okay, just identify yourself.

20 MR. SMILEY: Bill Smiley, Trane. So we  
21 are going to have two definitions for centrifugal  
22 fans, one unhooded and one hooded is that where we

1 are headed? I have no preference either way I was  
2 just asking a question. Now I do have another  
3 comment, the air doesn't necessarily exit  
4 perpendicular to the shaft but it is in that general  
5 direction so I mean how nit-picky do we need to be?

6 MR. HARTLEIN: Dan Hartlein, I would  
7 change the word to predominantly perpendicular I  
8 know, I will spell it for her, thank you.

9 MR. BOSWELL: And Mark?

10 MR. BUBLITZ: Mark Bublitz, the New York  
11 Blower Company. Are we mixing up definitions and fan  
12 categories? Because you can define a centrifugal fan  
13 like you have it but that doesn't matter, that's  
14 inclusive of multiple fan categories as communicated  
15 on the slides so you are going to add a lot of  
16 complexity up high.

17 MR. WOLF: I agree Mark, this is Mike Wolf  
18 and that's a great question because I'm thinking  
19 through the process here, maybe it would behoove us  
20 to start with the categories and get agreement on the  
21 categories first rather than the definition of at  
22 some point we will need a definition for the category

1 right?

2 MS. ARMSTRONG: Correct.

3 MR. WOLF: And right now the definitions  
4 don't align to the categories so maybe we start with  
5 the categories and define them.

6 MR. BUBLITZ: Mark Bublitz, New York  
7 Blower. That would be the big buckets I think and if  
8 we could agree on the buckets then we might be able  
9 to --

10 MR. WOLF: All right so Ashley let's go  
11 back.

12 MR. BUBLITZ: And put detail into what we  
13 think belongs in the buckets.

14 MR. WOLF: So we are going --

15 MS. ARMSTRONG: Going back to this?

16 MR. WOLF: Going back to that we are going  
17 to talk about a housed centrifugal backward bladed  
18 fan and so now we need a definition for that.

19 MS. WALTNER: Yeah this is Meg Waltner, so  
20 AMCA and the advocates have gone back and forth on  
21 definitions a lot over the past two years and have  
22 different draft definitions I would say, I think for

1 all of those categories. I don't know if that would  
2 be a good place to start.

3 MS. ARMSTRONG: Where are they?

4 MS. WALTNER: Some of them are in line  
5 with the broader definitions proposed by DOE and some  
6 are categories that DOE didn't propose definitions  
7 for.

8 MS. IYAMA: This is Sanaee. Most of the  
9 definitions that are on that slide for the fan  
10 categories were drafted based on the inputs from the  
11 stakeholders, including what was present in the  
12 submissions from AMCA.

13 MS. ARMSTRONG: Okay I think what you are  
14 hearing is that if you do have definitions specific  
15 to each of these categories we don't have them or at  
16 least in that level of detail what you are seeing.

17 MS. IYAMA: So I think on these slides  
18 there is the two categorizations schemes, there's the  
19 one used in the NODA and then there's the one  
20 presenting the list of categories that AMCA was using when  
21 defining what's a ducted or an un-ducted fan.

22 MR. BUBLITZ: Mark Bublitz here, is the

1 difference between the NODA and this list just the  
2 NODA kind of smashed them together?

3 MS. IYAMA: They can be directly mapped so  
4 we could use either -- and another way to do what you  
5 were getting at was I think, and that's sort of the  
6 background that we had in mind when we used those  
7 definitions that you have on the slides, is that  
8 instead of defining what's an actual housed, actual  
9 unhoused centrifugal house, centrifugal unhoused, we  
10 just defined axial fan, centrifugal fan and then what  
11 do we mean by housing and then you can sort of  
12 combine in a more modular way instead of defining  
13 each sub-category of fan.

14 MR. BUBLITZ: Mark Publitz, I'm sorry I  
15 forgot your name, did you have a comment on further  
16 clarifying Sanaee's comment on what the categories  
17 were? Okay.

18 MR. JASINSKI: No, I don't have them in  
19 front of me, that's all.

20 MS. ARMSTRONG: So if we go back to this  
21 slide --

22 MR. BUBLITZ: Mark Publitz, New York

1 Blower. I'm just wondering if you could take a  
2 temperature check on if we all looked at that list,  
3 do we think there's big holes, do we think if these  
4 buckets were set in front of us could I take most of  
5 our -- I think we are focusing on stand-alone right,  
6 most stand-alone stuff and would it fit in a bucket  
7 for the most part?

8 MS. ARMSTRONG: Sure so this is how we did  
9 it for the purposes of the NODA and each of them  
10 mapped to how you guys did it, ducted and non-ducted.  
11 I don't know that we necessarily care although this  
12 is going to be harder for us to ultimately the  
13 broader categories are easier for us than incumbent  
14 from a regulatory standpoint.

15 MR. WOLF: So Mike Wolf, Greenheck. Mark  
16 let me ask this, what you just said there is you  
17 brought up I think you said something about embedded  
18 or not embedded.

19 MR. BUBLITZ: No.

20 MR. WOLF: What did you just -- that's  
21 what I heard so we want to take a temperature check  
22 on the general categories.



1                   MR. BUBLITZ: Mark Bublitz, New York  
2 Blower. Whether we use the DOE list or this list I  
3 was just wondering if we could take a temperature  
4 check on do we think that  
5 all of our products, we are thinking of all of  
6 the things that are stand-alone, is this an  
7 acceptable list of buckets and you could -- whether  
8 we want to parse the different types of axial fans or  
9 could we just take the DOE list as a starting point  
10 and say we think this kind of encompasses all of the  
11 different fan categories.

12                   MR. WOLF: Okay so the temperature that  
13 you want to take is does this list encompass what we  
14 feel would be categorized as stand-alone fans?

15                   MR. BUBLITZ: Mark Bublitz, New York  
16 Blower. Yes.

17                   MR. WOLF: Okay so what's the temperature,  
18 Tom do you have something?

19                   MR. CATANIA: Yeah, yeah before you kind  
20 of vote on this or take the temperature, Tom Catania  
21 AMCA. I am a little concerned that because we have  
22 so much data I'm kind of picking up on Meg's earlier

1 comment that we have so much data and so much work  
2 already memorialized and sort of framework response  
3 that then evolved into a second NODA that if we  
4 create a new taxonomy that is inconsistent or makes  
5 it harder for us to map back to our data, we haven't  
6 advanced the ball and I think that when we look at  
7 this list of breakdowns that we were working on with  
8 the sequence that we do have to have ultimately in a  
9 term agreement, we have to get through scope, load,  
10 data, metric and all of these items that you have to  
11 have the end one in mind as you are creating the  
12 categories.

13 So I think we just have to be really  
14 careful that this exercise is advancing the ball and  
15 not complicating.

16 MR. BOSWELL: Dan?

17 MR. HARTLEIN: Yeah Dan Hartlein, Twin  
18 City Fan. I want to 100% agree with that. We have  
19 spent a lot of time on these categories and I think  
20 they are pretty solid so it almost feels like the  
21 question is in general any concerns? Let's move on.  
22 I would add a second thought to that and I think the

1 only place where we may have departed as an industry  
2 from the NODA was the concept of ducted and  
3 non-ducted and the difference for that is quite  
4 simple and that's we believe that static efficiency  
5 and static pressure is the right way to measure the  
6 non-ducted equipment where total is the right way to  
7 measure the ducted.

8 If it weren't for that differentiating  
9 effect I don't think there would be a need to have  
10 that split so to me we should look at these  
11 categories instead of trying to reinvent them we  
12 should say is everybody cool with these, let's go on  
13 to the next subject because I think we can be.

14 MS. ARMSTRONG: Great.

15 MS. WOLF: So to maybe put words in Mark's  
16 mouth I think that is what we are trying to do is to  
17 basically ask can we agree on this categorization of  
18 fans for stand-alone?

19 MS. PETRILLO GROH: This is Laura Petrillo  
20 Groh from AHRI. I'm not objecting I'm just wanting  
21 to point out that there were several people, several  
22 people here who were not in the room for a lot of

1 those discussions and maybe we would benefit from  
2 hearing you know what you came up with and why.  
3 Maybe this is common, you know across the industry, I  
4 just want to make sure we are all on the same page  
5 before we vote and go forward or take a temperature  
6 and go forward, it would be helpful for me.

7 MR. WOLF: This is Mike Wolf, Greenheck.  
8 I mean I was going to qualify when Dan said we I  
9 think the "we" we are referring to is the AMCA group  
10 and the energy advocates who have been part of that  
11 discussion, is that a fair statement of who "we" is?

12 MR. HARTLEIN: Yeah.

13 MR. COTANIA: Well I think it's really  
14 important to sort of get on the record that in the  
15 AMCA group that participated there are many AHRI  
16 members and divisions of AHRI members who are part of  
17 that process so I don't know the extent to which this  
18 institutional memory of the AHRI participants who  
19 participate through subsidiary -- fan subsidiaries  
20 illuminate your understanding but --

21 MR. WOLF: In fairness to Laura though I  
22 think it would be -- we can take a few minutes and go

1 through that.

2 MS. PETRILLO GROH: Those discussions were  
3 closed and no information of it was shared.

4 MS. ARMSTRONG: It was on the docket.

5 MS. PETRILLO GROH: Thank you.

6 MR. WOLF: So would -- I'm not sure where  
7 to take that, what -- is there anything specific  
8 Laura that you want to ask in bringing us --

9 MR. HARTLEIN: Dan Hartlein, I'm asking if  
10 Mark Bublitz would be comfortable covering the  
11 categories and what we did, he is the Chair of the  
12 Committee that did a lot of that work.

13 MR. BUBLITZ: Mark Bublitz --

14 MR. WOLF: He wasn't when it was done but  
15 --

16 MR. BUBLITZ: Yeah, yeah, thank you for  
17 pointing that out Mike.

18 MS. ARMSTRONG: Welcome to your new  
19 position.

20 MR. BUBLITZ: I'm stepping up. So we  
21 started if you scan the list you will see that wheel  
22 type got us started so there is backward, forward and

1 radial mixed flow and axial. And as I scan the list  
2 I can't think at the moment of another wheel type  
3 that got us started and then we said well sometimes  
4 the wheel and the housing together make a specific  
5 combination and that got us into the three houses,  
6 Dan do you have a comment?

7 MR. HARTLEIN: Yeah I was just going to  
8 add for the benefit of everybody in the room that  
9 functionally you will find that axial fans perform  
10 better in a high specific speed meaning lots of flow,  
11 minimal pressure generation relative to the  
12 centrifugal fan which tends to perform better at a  
13 lower specific speed which is a higher pressure  
14 relative to that flow.

15 So the specific speed calculations are the  
16 basis for those kind of product categories and there  
17 is an increasing performance as you move across that  
18 specific speed range where suddenly the axial fan  
19 becomes the dominant choice from an energy  
20 perspective and then there's also the basis of  
21 functionality, so there's some functionality in that  
22 as well when turning the corner and getting the

1 performance of an axial fan or a centrifugal fan,  
2 excuse me -- may not be afforded in the footprint of  
3 the application so in that border range there's  
4 sometimes on both ends there's a clear choice from an  
5 efficiency perspective.

6 In the middle it starts to kind of become  
7 almost a functional choice.

8 Okay, so I just wanted to share that.

9 MR. WOLF: Mike Wolf, Dan maybe for  
10 clarification I should know this but I don't, does  
11 that same logic apply to forward curved? Because  
12 that's a higher pressure fan?

13 MR. HARTLEIN: I'm not sure, is Greg here?  
14 Can you answer that I'm not sure.

15 MR. WAGNER: Greg Wagner, Morrison. In  
16 the realm of looking at fans from a size standpoint  
17 it's a higher pressure capability in terms of total  
18 pressure.

19 MR. SMILEY: Bill Smiley, Trane. It's  
20 kind of in between the centrifugal BI and radial and  
21 the axial. If you look at it on a specific speed  
22 relationship.

1           MR. WOLF: So this is Mike Wolf again, the  
2 reason that I bring that up is that I think there's  
3 going to be a lot of discussion around that topic  
4 later. Forward curves, I think maybe some of you  
5 know the Europeans just came out with their second  
6 pass of regulation and I can visualize the graph in  
7 my head but I don't know what specifically is on it  
8 but they have a break where they have an efficient  
9 requirement for forward curve fans I think up to a  
10 certain pressure and once it gets to that certain  
11 pressure they and Geoff maybe you can help me -- they  
12 really raised the requirement because that fan is no  
13 longer really the best you know, backward incline  
14 becomes a better solution than a forward curved and  
15 again I don't know all the technicalities of it but  
16 does that sound right to you Geoff?

17           MR. SHEARD: Geoff Sheard, AGS Consulting.  
18 My understanding is talking to the policy officer  
19 that he would like to see them regulated off the  
20 market.

21           MR. WOLF: Can you be a little more clear?

22           MR. SHEARD: I think he feels there are



1 more efficient solutions --

2 MR. WOLF: I'm just joking.

3 MR. SHEARD: Oh okay, American humor, not  
4 like English.

5 MR. BOSWELL: Armin?

6 MR. HAUER: Armin Hauer, ubm-papst. On  
7 the present ballot regulation up until 2000 that took  
8 effect in January, 2015 there was just a bend in  
9 efficiency curve requirement. In 2017 there have  
10 been some proposals to indeed have a jump in  
11 efficiency but this is not final yet, it is still  
12 being negotiated.

13 MR. WOLF: Thank you Armin. So Mike Wolf  
14 again, so do you guys again to move the discussion  
15 forward do we feel comfortable with what's -- I'm  
16 sorry go ahead Mark.

17 MR. BUBLITZ: I can finish my point. Okay  
18 so we started with let me be more accurate color  
19 types and then if you recall the first NODA came out  
20 and there were very broad buckets and we took those  
21 broad buckets and compared it against the existing  
22 AMCA categories which were really mis-mapped and we

1 rehashed all of that and we said well instead of a  
2 centrifugal fan we think there are distinct  
3 differences within this category so it really was  
4 there was no communication but there was a lot of  
5 give and take between what we had in front of us and  
6 our existing definitions and put those together and  
7 then there was lots and lots and lots of discussion  
8 on how application influenced a product definition.

9           And it's kind of a mish mash of things  
10 that are in and out based on application. If you  
11 swept with a broad brush you could put everything  
12 labeled axial, axial. So the other little -- the  
13 other significant strategy or thing we were trying to  
14 accomplish was as we understood it we wanted as many  
15 characteristics to be visual right, we understood the  
16 NODA to be -- to have a recommendation to say I need  
17 to walk up to this fan and identify it.

18           So there was a great -- there was great  
19 pressure to remove application descriptions from  
20 product categories and I hope I can communicate how  
21 long and painful it was for that list to get to where  
22 it's at, but I think that's how we got there and I

1 would be happy to try to take any questions of that  
2 process.

3 MS. PETRILLO GROH: I just want to make  
4 sure -- thank you it was a very good background just  
5 to make sure I got the thought process correctly.  
6 You looked at impeller types, categories based on  
7 specific speed, application impact and visual  
8 characteristics.

9 MR. BUBLITZ: This is Mark Bublitz, New  
10 York Blower. We wanted to -- we originally had  
11 application in there, dust material handling was in  
12 there, and then we understood the NODA to request a  
13 move to identify product categories visually, so  
14 temperature, dust material handling, we displaced  
15 those with more visual and whether that comes to be  
16 that's just how we understood it and what drove our  
17 decision-making.

18 MR. HARTLEIN: This is Dan Hartlein, Laura  
19 I just want to clarify just a little bit and that is  
20 that you laid that out almost like we set out with a  
21 matrix to solve these and we didn't. We spent lots  
22 and lots and lots of hours debating this, throwing

1 things at it, seeing what would stick and what  
2 wouldn't, but it wasn't like we had a definition from  
3 anybody to say go answer these questions. So we did  
4 it as an industry to say hey what are the holes here,  
5 have we covered it, do we have everything, what are  
6 the exceptions and so this is kind of where we  
7 landed.

8 MS. PETRILLO GROH: Thanks Dan I didn't  
9 mean to be reductionist about the process. It was  
10 really just to get some background information on how  
11 you all were thinking about it. Not being the fan  
12 expert that you guys are is this inclusive of  
13 basically all fans, including those --

14 MR. BUBLITZ: Mark Bublitz, New York  
15 Blower. That's the question.

16 MS. PETRILLO GROH: Okay.

17 MR. BUBLITZ: We think we got them all.

18 MS. PETRILLO GROH: Okay.

19 MR. BUBLITZ: We think you could put  
20 everything in a bucket.

21 MS. PETRILLO GROH: Thank you.

22 MR. FLY: Mark Fly with AAON so I want to

1 just throw a couple of things out there. Is a  
2 stand-alone fan is an unhooded centrifugal a fan  
3 type? From your guys perspective and I guess -- and  
4 I'll throw all three -- my three comments out and  
5 then are hooded centrifugals in your viewpoint ever  
6 applied un-ducted? And does it matter if it's a  
7 ducted inlet and a ducted outlet or one or the other  
8 because I think performance varies with all of those.  
9 And are we too much in the weeds trying to define all  
10 of that I guess is part of the question.

11 MR. BUBLITZ: Mark Bublitz, New York  
12 Blower. We were in those weeds a long time and we  
13 ended up -- we ended up saying yeah there's all kinds  
14 of different -- we think that in most cases those  
15 categories are applied in those ducting conditions  
16 and to get across the finish line we said oh this is  
17 the best we have got, so yes there are conflicting  
18 pieces, Dan I'll yield the floor.

19 MR. HARTLEIN: Yeah, Dan Hartlein. I just  
20 wanted to add that when we talk about the differences  
21 in our opinion of measuring on static efficiency  
22 versus the total, we are actually in the non-ducted

1 outlets so we are specifically referring to yeah -- a  
2 non-ducted outlet.

3 MR. WOLF: So this is Mike Wolf, so Mark  
4 are you proposing something different or I'm sorry,  
5 this is Mark, Mark Fly?

6 MR. FLY: Mark Fly, AAON. I'm not  
7 proposing anything different, I'm just trying to  
8 understand the thought process going forward so you  
9 know the reason for the definition between ducted and  
10 non-ducted was to be able to rate the fans in either  
11 static or total efficiency and draw a line there,  
12 that was the primary driver there.

13 MR. WOLF: Yes.

14 MR. FLY: Okay.

15 MS. ARMSTRONG: Not to be difficult.

16 MR. SMILEY: I have one question.

17 MS. ARMSTRONG: Oops sorry go ahead.

18 MR. SMILEY: Bill Smiley, Trane. If you  
19 have a housed centrifugal fan that's not connected to  
20 a duct but discharges it to a plenum, that would be  
21 classified as ducted on this list, would you use the  
22 outlet area then of the housing to calculate the

1 velocity pressure so you could get the total  
2 pressure? Is that how you would do it?

3 MR. BUBLITZ: Mark Bublitz, New York  
4 Blower. If you are in the ducted category that is  
5 what you would do.

6 MR. WOLF: Mike Wolf, Greenheck. But Bill  
7 let me understand -- that was our assumption and part  
8 of that assumption comes, at least in my mind based  
9 on AMCA standard 210 as structured right now and the  
10 method of test for those different fan categories.  
11 And the method of test in 210 and you guys jump in if  
12 I am wrong here, because it has been a few years  
13 since I have been real close to the testing.

14 But I believe the way we do that test is  
15 we put a duct on the outlet of that fan to be able to  
16 regain some of that energy in the testing process.  
17 Now you might take that fan and apply it somewhere  
18 where it doesn't have a ducted outlet and we are not  
19 saying that you are going to make that a non-ducted  
20 fan, and test it with no duct on it.

21 MR. SMILEY: I guess I was not really  
22 staying in the stand-alone fan category I'm sorry.

1           MR. HARTLEIN: The rest of us are trying  
2 real hard to -- this is Dan Hartlein, Twin City Fan.  
3 I wanted to add one other thought too and that also  
4 we had discussed entered into our filtering and  
5 thought process was also the potential and ability to  
6 actually have a different efficiency level on the  
7 different product lines because this kind of gives  
8 you a different range of efficiency level.  
9 Everything can't be an airfoil centrifugal fan  
10 running at peak efficiency so therefore these  
11 products kind of step a little bit and it gives us  
12 some flexibility in the future rulemaking in order to  
13 set by category a different target efficiency level  
14 if that became necessary, so that was the other thing  
15 that we had in mind as we created this, thank you.

16           MR. BOSWELL: And Tom did you have a  
17 comment?

18           MR. CATANIA: Yeah I just wanted to expand  
19 a little bit on what Dan just said and that is that  
20 you do, you know these conversations at the weed  
21 level do matter because you have to periodically step  
22 out of the weeds and say where are we going and I



1 think as we go through this exercise we have to  
2 continually do that and say okay, okay what is the  
3 significance of this distinction for the objectives  
4 that we are trying to achieve and that came up a  
5 little earlier when we were having our conversation  
6 about connected load.

7 Not so much on -- we had a separate  
8 conversation on more detailed making it a more  
9 detailed description of how we have been using  
10 connected load but the point is how much does it  
11 matter to the overall achievement of the overall  
12 efficiency objective and where might be the real  
13 issues on utility or any of the other dimensions that  
14 have to be considered so I do think as we go through  
15 this exercise sometimes we find ourselves in the  
16 weeds, we do have to step back and say okay what is  
17 the purpose of this exercise.

18 MR. WOLF: Dan?

19 MR. HARTLEIN: Yeah Dan Hartlein. One  
20 other point of clarification as well as I think back  
21 to this process -- we also talked quite a bit about  
22 the fact that we don't always determine how the fan

1 is applied when it ships from our factory. So the  
2 way that we looked at that as it came to ducted and  
3 un-ducted is that if it is shipped in a potentially  
4 ducted outlet configuration, we would call that a  
5 ducted fan, we would comply with the ducted  
6 requirement because we don't -- we simply don't know  
7 when the fan ships whether it is going to be applied  
8 you know, if it has an outlet flange maybe it is  
9 likely but who knows for sure so we just kind of  
10 concluded that we would see that as a ducted fan if  
11 it is shipped in an outlet configuration that was  
12 allowed to be ducted.

13 It takes the application question out of  
14 it right?

15 MR. WOLF: Joanna?

16 MS. MAUER: Dan I just want to -- this is  
17 Joanna, I just want to make sure that I am  
18 understanding what you are saying because I thought  
19 we were talking about you know if the fan is in one  
20 of the categories below, in the ducted column, it  
21 would be test rated as a ducted fan, is that what you  
22 are saying?

1 MR. HARTLEIN: That's essentially what it  
2 was.

3 MS. MAUER: Okay.

4 MR. HARTLEIN: Sorry, Dan Hartlein, yes.

5 MR. FLY: Mark Fly, AAON. But there's not  
6 a requirement that it be applied as a ducted fan.

7 MR. HARTLEIN: Dan Hartlein, that's  
8 accurate.

9 MS. ARMSTRONG: I think we will get to the  
10 ducted, un-ducted discussion when we talk about  
11 potentially a metric and test procedure conditions.  
12 One thing you probably have noticed if you took a  
13 deep dive into the NODA, DOE didn't differentiate  
14 between ducted and un-ducted. At the point of -- I'm  
15 not sure we exactly agree we will have that  
16 conversation, but let's first talk about these  
17 categories to get back to it and can we at least all  
18 agree that fans meeting for lack of a better term,  
19 the definitions in these categories should be in  
20 scope.

21 MS. WOLF: As stand-alone fans.

22 MS. ARMSTRONG: Well --

1 MR. WOLF: We are going to get there,  
2 we'll go to Brooklyn trust me. So temperature?

3 MS. ARMSTRONG: Temperature.

4 (People holding thumbs up)

5 According to my friend at the microphone,  
6 yes.

7 MR. WOLF: Okay so --

8 MS. ARMSTRONG: Okay so it's all thumbs up  
9 and one abstained.

10 MR. BOSWELL: I think two abstained.

11 MS. ARMSTRONG: Are you abstaining, your  
12 thumb is up.

13 OFF MIC: State the question?

14 MS. ARMSTRONG: Do we agree that those  
15 should be in scope for standards?

16 (People holding thumbs up).

17 MS. ARMSTRONG: Okay.

18 MR. SMILEY: A point of clarification in  
19 option one, stand-alone fans?

20 MR. WOLF: Stand-alone yes.

21 MR. SMILEY: You didn't state that. Okay,  
22 excuse me Bill Smiley, Trane.

1 MR. WOLF: Sorry Ashley, yes for  
2 stand-alone fans, okay. So now to address Ashley's  
3 thing maybe what I will propose here is instead of  
4 going down the scope of definition load, as long as  
5 everything is kind of agreeing on this and did  
6 anybody object to this? We had some people that  
7 weren't sure, I think probably because they don't  
8 know if number one impacts number two or three. So  
9 what I would propose take a temperature again is if  
10 we can agree that this group of fans should be in  
11 scope as we all kind of have it envisioned in our  
12 head, there are probably some details that we have  
13 got to work out here, trust me there is -- then could  
14 we go and start talking about category two, which  
15 ones of these fans -- these stand-alone fans  
16 potentially get used in non-regulated products?

17 So they get put in another piece of  
18 equipment. Temperature on that would everybody agree  
19 with taking that on as the next discussion topic?

20 MS. PETRILLO GROH: I would actually be  
21 more interested in hearing about what's on slide 53  
22 which seems to be the rest of what was discussed

1 previously with the AMCA members.

2 MS. ARMSTRONG: You don't have it you are  
3 not going to find it.

4 MS. PETRILLO GROH: Or it's --

5 MR. FERSTROM: So Ashley this is Gary. By  
6 agreeing to including these we are not presuming  
7 anything not here is excluded right, thank you.

8 MS. ARMSTRONG: Correct.

9 MR. WOLF: Is this is the slide Laura?

10 MR. HARTLEIN: This is Dan, Gary I would  
11 be shocked if there's anything not on that list, but  
12 I would be really curious if you find something, it  
13 would be interesting. We have been pretty -- I think  
14 we have been pretty thorough here.

15 MR. FERSTROM: I have a little -- Dan, Dan  
16 this is Gary. I have a little axial fan powered by  
17 battery operated motor on my beanie and I wanted to  
18 make sure that it wasn't going to be excluded.

19 MR. HARTLEIN: This is Dan, I think it  
20 depends on if it is a rechargeable battery or not.

21 MR. WOLF: So --

22 MS. ARMSTRONG: So I actually think you

1 should go back to 8 because I think you should  
2 proceed with the discussion in terms of are these  
3 fans actually embedded products that are unregulated  
4 and what should we do for those?

5 MR. WOLF: So I will go back to that  
6 question from a process standpoint would everybody  
7 feel comfortable with moving on and discussing this  
8 slide relative to fans and fans in  
9 non-regulated products?

10 MR. FLY: And you are saying are all of  
11 these included, this is Mark Fly with AAON. Are all  
12 of these included? I would agree that they are and I  
13 am completely talking out of turn because I don't  
14 know anything about it but cross flow fans is one of  
15 them that comes up and embedded, unregulated products  
16 that isn't in there.

17 MR. WOLF: Laura, you have got a question  
18 or a suggestion or comment?

19 MS. PETRILLO GROH: I was just curious if  
20 the centrifugal powered roof and wall ventilators and  
21 the actual powered axial powers roof and wall  
22 ventilators were considered fan types or equipment

1 types, I don't know.

2 MR. HARTLEIN: This is Dan. An area of  
3 great debate for us in that arena and after much,  
4 much consideration I think the ability for it to  
5 operate independent as a fan kind of put us to the  
6 side of saying that's a fan. So we kind of concluded  
7 that that was a fan is where we were, that's an --  
8 you know, that's an independently testable piece of  
9 equipment as a fan and the parts of it can't work.

10 MR. WOLF: Laura I guess I would propose  
11 we come back to that discussion because I really  
12 think that's going to open up a whole other can of  
13 worms.

14 MR. HARTLEIN: It's going to take you  
15 down the other path.

16 MR. WOLF: Yeah.

17 MS. PETRILLO GROH: Okay so we will look  
18 at everything but those.

19 MR. WOLF: Yeah so maybe if we can just  
20 get through and again I'm not trying to force it if  
21 you guys have another idea.

22 MS. PETRILLO GROH: That's fine, I just



1 want to be clear about what we are talking about.

2 MR. WOLF: Okay so maybe well okay, all  
3 right. So I guess the question I would pose is this  
4 group of fans and I don't even -- I mean maybe first  
5 of all let's talk about what are non-regulated  
6 products? Could somebody give me an example of those  
7 or maybe I will start out with giving what my  
8 understanding of what non-regulated product is that  
9 my company manufactures and I think Nick this is  
10 where you jump in too maybe if you want -- like an  
11 energy recovery ventilator.

12 I know this has been a topic with AHRI I  
13 think it's one of your product categories right  
14 Laura?

15 MS. PETRILLO GROH: Yes.

16 MR. WOLF: But it is a non-regulated  
17 product right?

18 MS. PETRILLO GROH: Correct.

19 MR. WOLF: So okay so correct, so Mark --  
20 Mark Fly you had the comment this morning that an ERV  
21 unit we have got two fans. So you know, so we are  
22 regulating those fans then in that ERV unit whether

1 we are or aren't I guess. Let me back up -- that  
2 would be an example of a non-regulated -- a fan that  
3 would go into a non-regulated product.

4 Another example that I have would be a  
5 piece of equipment that goes on you know most  
6 restaurant and kitchen applications. It's a makeup  
7 air unit, it has a lot of the same components as some  
8 of the unitary stuff I guess that we have been  
9 talking about with regard to heating and cooling,  
10 sometimes it doesn't.

11 But to my understanding that's a  
12 non-regulated product. Is that -- am I correct on  
13 that?

14 (Only a few thumbs up)

15 Okay any other examples that would fall  
16 into this that we ought to give consideration to as  
17 we continue the discussion here?

18 MS. MAUER: This is Joanna. I think one  
19 example would be unitary equipment but that have  
20 equipment with capacity that is greater than 760,000  
21 BTU's per hour which are currently covered by DOE  
22 standards.

1                   MR. WOLF: So I guess let me ask a point  
2 of -- Ashley how do we get these things kind of  
3 noted?

4                   MS. ARMSTRONG: Do you want me to type?

5                   MR. WOLF: Yeah please.

6                   (Ms. Armstrong to front to type on  
7 slides).

8                   MR. HARTLEIN: This is Dan. I just want  
9 to understand the exercise here. So we are going to  
10 create a massive list of places where fans are used  
11 in another piece of equipment that is unregulated.  
12 Might I suggest that that is going to be 90 to 1,000  
13 pages long and we probably should talk about where  
14 they are actually regulated because that is a very  
15 short list.

16                   MR. WOLF: Okay so this is Mike Wolf so  
17 you suggest that we jump to number three first?

18                   MR. HARTLEIN: Well I am just saying that  
19 creating this list is going to be huge when you  
20 include industrial and commercial applications of a  
21 fan inside another piece of equipment, it is going to  
22 be a massive list.

1 MS. PETRILLO GROH: Probably the main  
2 discussion is to fans one horsepower and above for  
3 this too?

4 MR. HARTLEIN: That's a good question.

5 MS. ARMSTRONG: Let's start there we'll  
6 see how this goes. So just as a fundamental before  
7 we create the list Dan had a good point. We could be  
8 here all day creating a list of endless examples.  
9 Can we take a temperature? Do people have a  
10 fundamental objection to fans that are in unregulated  
11 equipment being in scope? So fans that are -- fans  
12 that are of these categories then unregulated  
13 equipment. Does anyone have an objection to those  
14 being in scope for standards?

15 MR. CATANIA: I have a question there.  
16 That doesn't preclude them being then later  
17 classified for an exemption if there is some good  
18 reason for that particular one to be exempted right?  
19 This is just we are starting big and then --

20 MS. ARMSTRONG: Starting big and go back  
21 to -- but as a fundamental big picture because then  
22 the list becomes irrelevant. If we all fundamentally

1 agree with the premise then we can move on, then it  
2 really becomes about bucket three.

3 MS. PETRILLO GROH: This is Laura Petrillo  
4 Groh from AHRI. There are a few equipment types that  
5 are tied directly to where the fan operation is tied  
6 directly to heat rejection that we would -- that we  
7 are not going to agree to yet.

8 MR. FERSTROM: Ashley this is Gary. How  
9 would we know which of these fans would be going into  
10 non-regulated equipment if they had the potential to  
11 be installed in different kinds of equipment,  
12 regulated, non-regulated, et cetera?

13 MS. ARMSTRONG: So I think you just jumped  
14 us back to this morning's discussion where we were --  
15 I mean point well taken, I agree right, just  
16 generally as a premise it is hard to know from the  
17 point of the fan manufacturer where ultimately these  
18 things will have to go. So what I think we were  
19 trying to do though is talk through some of the finer  
20 details and maybe save the more sticky issue for the  
21 area where it might only exist.

22 MR. FERSTROM: Okay well putting that

1 aspect aside for the moment you asked a good question  
2 and I support these categories for unregulated  
3 equipment.

4 MS. ARMSTRONG: Others?

5 (People's thumbs up).

6 MS. ARMSTRONG: How about raise your hand  
7 if your thumb is not up, Mike is it down or sideways?  
8 You're going down, really?

9 MR. WOLF: I can switch in a heartbeat,  
10 trust me.

11 MS. ARMSTRONG: You are standing very  
12 close to me you know.

13 MR. WOLF: It's a playground.

14 MS. ARMSTRONG: Okay.

15 MR. WOLF: Since my thumb is down can I  
16 go?

17 MS. ARMSTRONG: Yeah, thumbs down.

18 MR. WOLF: Mike Wolf from Greenheck. So  
19 this comes back to and since I guess my question to  
20 the group is if we go to this product right here as  
21 an example all right -- this product I don't -- this  
22 product could fall if we go back to the -- so this is

1 I think everybody can relate to so I can't walk away  
2 from the mic and point so if you look at this blower  
3 right here I think everybody is -- take a  
4 temperature, everybody would recognize that as a  
5 scrolled centrifugal blower, would that be a fair  
6 statement?

7 MS. ARMSTRONG: The top one is a laser.

8 MR. WOLF: The top one? Can you see it I  
9 can't see it.

10 MS. ARMSTRONG: It's right there.

11 MR. WOLF: I can't see it sorry, I'm color  
12 blind I guess. Maybe -- so the question I have  
13 relative to this particular product okay because we  
14 are you know, Laura you kind of touched on it a  
15 minute ago so if you look at the fan over here in my  
16 mind I would say that's a power roof ventilator. It  
17 goes on a roof, it's got power -- I think we don't  
18 have a definition of a power roof ventilator I don't  
19 think but in terms of the way I envision it I would  
20 say that's a power roof ventilator.

21 But it is also a centrifugal housed blower  
22 so now this piece of equipment right here by our

1 definition I would say is an unregulated product,  
2 okay. So for purposes of regulation the thing that I  
3 am unclear of is -- does this get regulated or does a  
4 scroll blower get regulated? And what I am hoping is  
5 if we could work our way through this exercise and  
6 hopefully it is a pretty simple one, it will help us  
7 when we get into the further discussions on embedded  
8 and regulated products. So what's the yeah Armin?

9 MR. HAUER: Armin Hauer, ebm-papst. I  
10 think it would be easiest if we regulated scroll  
11 blower.

12 MR. WOLF: Mark?

13 MR. BUBLITZ: Mark Bublitz, New York  
14 Blower. In looking at the picture I just ask the  
15 question could we say if the fan exists on its own  
16 and it becomes the category. But if the fan was --  
17 if that power roof ventilator or if you couldn't pull  
18 the fan out unless it was just a pile of parts or the  
19 housing was an integral part of the roof ventilator,  
20 then that wouldn't be the fan. The whole thing would  
21 be the fan.

22 Is it a free-standing issue, have you guys



1 struggled with any of those thoughts when looking at  
2 your fan categories?

3 MR. WOLF: So Ashley I think Mark's  
4 directing that question to the DOE, have we struggled  
5 with that concept before?

6 MS. ARMSTRONG: Yeah so we can do this a  
7 number of different ways. I think one of the things  
8 we had on our slides before was we had considered a  
9 definition for housing and this is part of the reason  
10 why and so to the extent something is not that  
11 definition then we could point to a way to regulate  
12 that piece of equipment.

13 MR. WOLF: Do we want to pull that up and  
14 look at it?

15 MS. ARMSTRONG: It's just a fan inside a  
16 box, that's all I see.

17 MR. BUBLITZ: I'm sorry could you be more  
18 clear on your comment about housing? I think I know  
19 where you are going but --

20 MS. IYAMA: So this is Sanaee.

21 MR. BUBLITZ: Thank you Sanaee.

22 MS. IYAMA: I think one of the ideas behind

1 listing the basic parts of a fan in the fan  
2 definition was to get a sense of what's the physical  
3 boundary for a fan. Like is it just the impeller, is  
4 it the impeller and shaft and the structure or the  
5 housing? And when we say housing, what do we mean?  
6 Is the housing also something that serves as a  
7 structure for the fan or just something that can be  
8 easily removed?

9           So maybe one thing to consider is what do  
10 we define as the basic parts of the fan meaning the  
11 parts that need to be here for the fan to be able to  
12 be tested.

13           Maybe that could help sort of deciding  
14 whether this is a PRV or not.

15           MR. WOLF: So this is Mike Wolf, is this  
16 a question or suggestion or something we can  
17 reference?

18           MS. IYAMA: It's just a suggestion.

19           MS. ARMSTRONG: What is the suggestion, I  
20 think that's what they are asking?

21           MS. IYAMA: What?

22           MS. ARMSTRONG: What are we asking, if we

1 base it off of this right where we said --

2 MS. IYAMA: Do we agree on the basic parts?

3 MS. ARMSTRONG: Yeah so if we agree about  
4 the basic components of a fan, are an impeller,  
5 shaft, bearings and a structure or housing and then  
6 we go forth and say you know the structure is any  
7 integral component of a fan necessary to support the  
8 impeller and then the housing any integral component  
9 of the fan that directs flow into or out of the  
10 impeller and/or provides protection to the internal  
11 components, a housing serves as a fan structure would  
12 that do it? Would that help with this  
13 differentiation problem?

14 It's on slide 49 for those that have the  
15 print outs from yesterday. You don't have it  
16 because it is in the other -- oh you have the other  
17 slides out apparently, 48.

18 MR. HAUER: This is Armin Hauer speaking.  
19 Now with a PRV like that if we define that PRV is a  
20 fan and then you have this PRV different versions,  
21 maybe for hurricane rating or for a different outage  
22 configurations, would you then like to see for PRV's

1 different minimum efficiency levels based on this  
2 exterior arrangements? I think it's really not  
3 doable.

4 MS. ARMSTRONG: I don't think we would  
5 want to see that.

6 MR. WOLF: This is Mike Wolf. I wouldn't  
7 want to see that. I mean part of the eloquence of  
8 the FER that is in the last NODA is that we can use  
9 pretty much the same you know metric across fan types  
10 so it keeps it very simple so I think my initial  
11 response is no.

12 MR. HAUER: This means you have to leave  
13 the louvers and everything outside of the PRV away  
14 from your consideration so it would not be a fan.

15 MR. WOLF: Well I guess I'm going to defer  
16 to somebody here that put these components -- that's  
17 a great question I agree, I don't know the answer  
18 though.

19 MS. ARMSTRONG: So this is Ashley from  
20 DOE. I mean we do have I think elements in our  
21 regulations that could deal with that. I don't think  
22 the idea would be for every different combination of

1 components or accessories or housing structures that  
2 are built for different environments would  
3 necessarily have to be tested and rated.

4 I mean we have a variety of different ways  
5 we could deal with that but that definitely wasn't  
6 the intention, no.

7 MR. FLY: This is Mark Fly with AAON. So  
8 just to kind of push that around and so I get a  
9 better understanding of your interpretation, let's  
10 take a simple air handler which is a fairly high  
11 volume HVAC product that's around the industry and it  
12 has a filter, a coil, a fan discharging and  
13 so and let's say for the  
14 sake of argument that the structure that supports the  
15 fan impeller is integral to the cabinet which happens  
16 on smaller air handlers many times.

17 So is the coil included? Is the filter  
18 included? Is the whole cabinet from inlet to outlet  
19 part of the fan because that's the housing? And I'm  
20 talking about and a housed fan, let's say is the  
21 discharge -- because you can't pull that impeller and  
22 motor out, it falls on the floor by itself.

1           And I guess I'm asking your interpretation  
2           -- how would you see that, or do you know?

3           MS. ARMSTRONG: I mean I think that's up  
4           for discussion right. I think that's part of what  
5           this was meant to be. You know it could go either  
6           way, obviously I think you have to have some type of  
7           a structure there that makes it a fan, now whether it  
8           needs to have all of the components that are going in  
9           that cabinetry as well, that could be discussed.

10          MR. FLY: Mark Fly with AAON again. And  
11          so if we test it without the components we are  
12          testing it in a configuration that will never be  
13          reapplied.

14          MS. ARMSTRONG: I understand.

15          MR. HARTLEIN: This is Dan Hartlein from  
16          Twin City Fan. There's also a range of products  
17          called plenum fans that can run obviously independent  
18          so it is a fan in and of itself even though it's an  
19          unhoused centrifugal fan typically. And then there's  
20          the range of product where it's really not a fan  
21          until it's built in so my question would be when that  
22          happens so if an air handling unit manufacturer buys

1 a wheel from a fan manufacturer, when does that  
2 become a fan at the point that it's testable as a fan  
3 so the point of regulation in that case would not be  
4 the impeller -- the point of regulation would likely  
5 be when it was built into that cabinet is that  
6 correct?

7 MS. ARMSTRONG: (Nodding).

8 MR. HARTLEIN: Okay thank you.

9 MR. WOLF: Laura?

10 MS. PETRILLO GROH: I have a question  
11 about the thought exercise that we were going  
12 through. Can you go back to the pictures, if we know  
13 what slide that is.

14 MR. WOLF: I'm sorry the picture that --

15 MS. ARMSTRONG: It's a website.

16 MS. PETRILLO GROH: Oh I'm sorry it's a  
17 website here. So testing of this product which is a  
18 -- is that a power roof ventilator?

19 MR. WOLF: It depends.

20 MS. PETRILLO GROH: Half of it? So can  
21 you test the fan by itself?

22 MS. ARMSTRONG: Yes.

1 MS. PETRILLO GROH: And you can test the  
2 power roof ventilator too?

3 MR. WOLF: Yeah.

4 MR. SMILEY: Bill Smiley, Trane. That  
5 would apply to this particular example but all power  
6 roof ventilators do not necessarily have a  
7 stand-alone fan installed in its entirety and in the  
8 closure. Sometimes you have the power roof  
9 ventilator impeller, the rest of that unit structure  
10 and everything is part of the housing of the entire  
11 power roof ventilator. So yes and no.

12 MR. FERNSTROM: This is Gary, the power  
13 roof ventilator is this thing that goes on the roof  
14 that sucks the air out of the building and discharges  
15 that --

16 MR. WOLF: Gary, I'm sorry Mike Wolf here.  
17 I'm going to stop you there. It doesn't always suck  
18 it out of the building, sometimes -- in this  
19 particular case, that's why I brought this up this is  
20 blowing it back in to the building sorry.

21 MR. FERNSTROM: Well anyway what I was  
22 trying to do is differentiate between the shroud and



1 the actual air movers inside and you know here you  
2 have a sort of a cubicle shroud and one sort of an  
3 air mover. As was pointed out earlier you might have  
4 the fan being part of the tube and it could be all  
5 one piece of equipment.

6 MS. ARMSTRONG: So I think we could talk  
7 all day about potential different variations and  
8 configurations thereof and how they could or couldn't  
9 be so you brought up this lovely example, how would  
10 you test it? How do you want to test it?

11 MR. WOLF: I guess let me answer this is  
12 Mike Wolf, Greenheck. I guess I will answer it two  
13 ways, number one the way that it is tested today is  
14 we test it as a unit like is shown on the left here  
15 okay. So we test it like I would envision testing a  
16 power roof ventilator.

17 For purposes of this regulation to keep  
18 life simple for everyone I would propose testing this  
19 fan on the right because based on the description of  
20 the slide that we just looked at this component here  
21 has an impeller, it has some drive components and it  
22 has a housing. Now the fact that we put a secondary

1 housing on it for purposes of utility that's called,  
2 because that is all it is there for.

3 And the utility in this case is we are  
4 trying to prevent from sucking rain and snow and  
5 debris into the building so it's really a question of  
6 utility at that point and the fan itself is this  
7 component -- I'm sorry the one on the right. So the  
8 answer to your question to ask me what I would  
9 suggest or propose for this rulemaking is the fan be  
10 regulated at its most basic level and Mark I think  
11 that's what you were saying to this earlier.

12 MS. ARMSTRONG: Yeah so DOE agrees with  
13 that.

14 MR. WOLF : Okay.

15 MR. HARTLEIN: I would add a little  
16 thought to that. Basic I think could be further  
17 defined as a basic testable configuration because we  
18 have got to -- to comply with the regulation it has  
19 got to be testable and provable or some alternative,  
20 what do you guys call it, ADEM, EDM I think --

21 MS. ARMSTRONG: You got it.

22 MR. HARTLEIN: I'm getting much better at

1 it.

2 MR. WOLF: Could somebody define what that  
3 is for the people who might not know.

4 MR. HARTLEIN: That's Alternative  
5 Efficiency Determination Method.

6 MR. WOLF: And what is that and where  
7 would it be used and how does it apply to this?

8 MR. HARTLEIN: Well for example the  
9 example I would use is that if you were shipping that  
10 fan as a bare-shafted fan meaning no motor and belt  
11 drive, there would be an acceptably calculable method  
12 that would estimate the wire to air, the conversion of the  
13 electrical power to the mechanical power in order to  
14 make the fan work, so to me that would be a  
15 calculation that would allow us to include the motor  
16 and I believe AMCA 207 has been established to do  
17 exactly that as an industry standard.

18 MR. WOLF: Okay so this is Mike Wolf from  
19 Greenheck again. So I get that, you wouldn't  
20 consider extending that to say housing or casing  
21 losses or would we? And I'm thinking of Mark Fly's  
22 situation where okay we are going to put this fan in

1 something, and do I test it with everything in there  
2 or can I come up with some generic casing losses to  
3 estimate what the performance is going to be.

4 MR. FLY: This is Mark Fly with AAON. So  
5 are the system effects imposed by putting the fan  
6 inside of a box in or out of the regulation?

7 MR. WOLF: Well I'll take -- this is Mike  
8 Wolf again, I'll take a shot at answering. Based on  
9 what I am hearing right now as long as the fan has  
10 the components of an impeller, a drive and housing,  
11 allow it to be supported on its own then it would be  
12 tested that way. Now if you have got -- let's take  
13 this example because everybody can visualize.

14 Let's say that I don't have this housing  
15 here, I actually build the fan into this thing on the  
16 right. I built some kind of a drive frame assembly  
17 and I figure out how to get rid of all this extra  
18 stuff here on the right and cut the cost of this  
19 thing by just putting an impeller and a drive  
20 mechanism in this outside part now becomes my  
21 housing.

22 Now I would be required to test that fan

1 that way. I don't know if that answers your question  
2 or not Mark but --

3 MR. HARTLEIN: Mike this is Dan Hartlein,  
4 I would add to that as well that typically that that  
5 exchange that you just did was a trade of cost for a  
6 lower efficiency. So in that situation I would think  
7 that would have to apply so we are trading costs for  
8 a product that doesn't work as well. It may work  
9 well enough but it doesn't work as well so that  
10 scroll is specifically designed to effectively  
11 capture that energy which is an expansion outward,  
12 right? It's a radial expansion that is then captured  
13 and channeled into a flow that we can use.

14 MR. WOLF: So Dan, Mike here again. So I  
15 would say you could make that assumption, who knows  
16 maybe there's some smart guy in the room here that  
17 figures out how to make the fan more efficient  
18 without that housing and extra cost and now it's  
19 really a case of he's built the better mousetrap and  
20 we want to regulate that poor mousetrap.

21 MR. HARTLEIN: This is Dan Hartlein again.  
22 And that the plenum fan industry exists because of

1 that point. That fan, actually that duty point is  
2 more effective than the housed alternative so in that  
3 case we have done precisely that, we have made the  
4 fan less expensive and, not but -- and more efficient  
5 so we have done both.

6 MR. FLY: I was going to say -- this is  
7 Mark Fly with AAON. I was going to the same point so  
8 also I have the ability of that particular fan in the  
9 work it needs to do and maybe it needs to move air at  
10 a lower velocity than would be typical of a housed  
11 fan. So -- on the other hand how do you deal  
12 typically in an AMCA arrangement you test a plenum  
13 fan in a completely open discharge application and  
14 I'm not aware of many places where a completely open  
15 discharge is the application.

16 So going back to my air handling example  
17 with Ashley, so could I take the discharge plenum off  
18 of it and test it because I can test it in a 210  
19 arrangement by just taking the walls off the  
20 discharge plenum and it's tested in a 210 un-ducted  
21 discharge plenum fan arrangement and it may -- and I  
22 won't have to take the outlet losses of having the

1 exit off of my plenum, so there's lots of ways.

2 MR. WOLF: So I'm sorry Mike, was that a  
3 question to Ashley or is it just a comment that we  
4 have to work through?

5 MS. CATANIA: Tom Catania, AMCA. You know  
6 I think that if I'm understanding the functional  
7 elements of this shroud here to me the distinction  
8 you folks are talking about is the distinction  
9 between a component part or housing that performs  
10 that has a functional role in the movement of air  
11 process as opposed to something nearly protecting  
12 against external elements or you know, that sort of  
13 thing and if it is part of this core function of  
14 using energy from the utility supplied portion of the  
15 grid, I guess if you are really going to find  
16 distinctions, that's in the sweet spot of what we are  
17 trying to address here.

18 If on the other hand this component is  
19 only there for protective purposes or something and  
20 is not affecting the conversion of energy into air  
21 movement activity, then it would fall outside. My  
22 question would be are there any broad categories of

1 things where you have a large chunk of connected load  
2 where there is a real debate as to whether or not  
3 that add-on component is being used for functional  
4 purposes versus protective purposes.

5

6 Because to me that's the only reason to  
7 spend any more time on it -- if it is just sitting  
8 there like a hat on top of the thing, a rain hat then  
9 I don't know why we would want to spend too much time  
10 on it.

11 MR. FINE: Are you saying that you want to  
12 limit your definition of a fan to just that which  
13 those I guess components or those -- that part of the  
14 structure that actually transfers usually electrical  
15 energy into moving air?

16 MR. CATANIA: Well I'm always -- I'm very  
17 reluctant to you know, have -- so flippantly offer  
18 such a fundamental definition but what I am saying is  
19 I am trying to deal with this category of parts that  
20 are associated with the fan that don't really play  
21 any functional role in the activity of moving air.

22 MR. FINE: In the fan part.



1 MS. JAKOBS: This is Diane and those  
2 louvers direct the flow into or out of the impeller.  
3 You know based on the housing definition they are  
4 applicable.

5 MR. CATANIA: Yeah well I agree with that  
6 because that goes to this whole -- I agree with the  
7 part of what you just said that goes to the issue of  
8 is it part of the role of converting energy into air  
9 movement, but that's not the example we had on the  
10 screen, the component part we were talking about  
11 didn't perform any role like that, if I understood  
12 correctly.

13 MS. JAKOBS: Well it directs the air to  
14 the impeller and also the energy consumption would be  
15 different with and without the louver.

16 MR. SMILEY: Not in this case.

17 MS. ARMSTRONG: Diane not in the picture  
18 that was on the screen.

19 MR. SMILEY: Not necessarily, I mean that  
20 could change the way -- Bill Smiley, Trane -- those  
21 louvers could change the way the air goes into the  
22 inlet of the housing which can change the way that

1 the impeller interacts with the air.

2 MS. ARMSTRONG: And so I mean you guys --  
3 we can change this definition. They are talking  
4 points, they are a starting point. I think the fact  
5 that what we are trying to do though is explain that  
6 just functionally from a testing standpoint some type  
7 of housing is needed and if that's this integral  
8 housing -- I agree with the comments in the room  
9 about this idea that an external housing that's  
10 added separately, that has a specific utility and the  
11 many variations thereof that might be offered with a  
12 given fan model that already has its own housing to  
13 the fan are extraneous for the point of this  
14 regulation.

15 And I think that's what is important. I  
16 mean at least we all fundamentally agree with that  
17 point. Yes? Yes, yes, yes.

18 (People thumbs up)

19 MR. WHITWELL: So this is Bob Whitwell  
20 from Carrier. Just to clarify Ashley so using this  
21 example here, this fan and this housed centrifugal fan  
22 can be applied in this roof ventilator could be in an

1 air handler that sits up on a roof, could be in a  
2 large rooftop unit. In all of those cases this would  
3 be tested with just a fan and the housing I think is  
4 what I am hearing as proposed, correct?

5 MS. ARMSTRONG: If it's included in those  
6 other parts with the fan and the housing, does that  
7 make sense? The answer is yes as long as -- I think  
8 we are fine.

9 MR. WHITWELL: Yeah so this fan --

10 MS. ARMSTRONG: As long as all the  
11 components on the right are there.

12 MR. WHITWELL: All the components on the  
13 right meaning not the cabinet but meaning that?

14 MS. ARMSTRONG: Yes.

15 MR. WHITWELL: And the fan?

16 MS. ARMSTRONG: Yes.

17 MR. WHITWELL: So in a non-regulated  
18 product this fan would be tested the same way?

19 MS. ARMSTRONG: Yes and not all the  
20 variations thereof that might be applied.

21 MR. WHITWELL: Right.

22 MS. ARMSTRONG: Correct. Do you agree

1 with that? Oh you are not voting.

2 MR. WHITWELL: Yes unfortunately I'm not  
3 voting in this one.

4 MR. BOTELEER: This is Rob Boteler with  
5 Nidec. Am I on? This is a little bit and you guys are  
6 going to learn this -- this is a term we call basic  
7 model and that's where you are headed. And in the  
8 motor world we have basic models, we only have 156 of  
9 them and then we -- whoops, put different mechanical  
10 components on there or we put seals and we still only  
11 report back to DOE based on the basic model.

12 And in motor that's horsepower speed and  
13 enclosure, we only have those three caveats that  
14 define the basic model. Try to keep the amount of  
15 product that you have to manage, the skews that you  
16 have to manage once you get going to a minimum,  
17 instead of adding all of the mechanical variations  
18 that you have.

19 MR. HARTLEIN: So Rob, this is Dan  
20 Hartlein, Twin City Fan. The challenge we have in  
21 this room and in this industry frankly is that I  
22 don't know of a motor supplier who sells the rotor

1 and someone else puts it in their housing or their  
2 stator. So I know that happens on large equipment  
3 but in your -- I don't think -- does that happen in  
4 your industry?

5 MR. BOTELEER: We sell thousands of them  
6 every week.

7 MR. HARTLEIN: You do.

8 MR. BOTELEER: Yeah we sell a rotor and a  
9 stator to a manufacturer who installs that possibly  
10 in a pump or possibly in a fan.

11 MR. HARTLEIN: Right.

12 MR. BOTELEER: And when that occurs --

13 MR. HARTLEIN: Okay.

14 MR. BOTELEER: If they still then meet the  
15 9 caveats of what is an electric motor they just  
16 became a motor manufacturer.

17 MR. HARTLEIN: So they are at the point of  
18 regulation then.

19 MR. BOTELEER: If they meet the 9 points in  
20 the regulation.

21 MR. HARTLEIN: Right, got it, good thank  
22 you, I didn't realize that. I always pictured a

1 motor as this self-contained --

2 MR. FERSTROM: This is Gary. I always  
3 pictured a fan as this self-contained thing.

4 MR. HARTLEIN: Point well taken Gary.  
5 Little did you know.

6 MR. WOLF: Well okay --

7 MS. ARMSTRONG: Go ahead, I mean --

8 MR. CATANIA: I am happily -- I have some  
9 remote intelligence being conveyed to me by people  
10 who really know what they are talking about in this  
11 area and apparently there are some categories of fans  
12 where the weather protection also is not removable  
13 and has to be tested that way so I will leave it to  
14 you guys to explain that in more detail but we don't  
15 want to let that get lost here, it should still be  
16 covered, including that piece.

17 MS. ARMSTRONG: So you guys can't see our  
18 notes over here as we are scribbling away but I think  
19 we see you know, from a simplicity standpoint and we  
20 see kind of two buckets and that is what is what I  
21 would call just the fan and this testable  
22 configuration that has the impeller et cetera and the

1 housing and then we see what I would call an embedded  
2 product which doesn't, you know, by its parts it's not  
3 in a testable configuration and adding additional  
4 things to it -- it is actually basic parts and it is  
5 not -- it doesn't become a testable configuration  
6 until it is actually included in a larger product.

7           And I think that those are the two  
8 categories that we are talking about and there are  
9 ways to get to the same answer for both. And so --  
10 and some of it maybe defaults and some of it may be  
11 certain type of testing, some may be system losses  
12 that are default values, I don't know what the right  
13 answer is but I think those are the two buckets that  
14 we are talking about.

15           So really to me it comes down to what is  
16 the definition of this testable configuration. What  
17 is a testable configuration look like because if a  
18 fan has already been tested in a testable  
19 configuration and you are just adding additional  
20 parts to it for utility reasons or otherwise, you  
21 know I think we could have the conversation but  
22 generally speaking I don't think we need to test it

1 in every optional part that may be added to it, at  
2 least that's my personal opinion.

3 I don't see a reason why we wouldn't go  
4 down that pathway that would address what was on the  
5 screen. It doesn't address all of the issues in  
6 terms of when I don't have a testable configuration  
7 and I am an actually embedded to get my testable  
8 configuration what do I do -- but at least for those  
9 that have a testable configuration, regardless of  
10 whether they get embedded or not or added to later.

11 I mean do people agree that those should  
12 be in the scope for standards? Temperature check?

13 (People thumbs up).

14 MS. PETRILLO GROH: Housed specifically?

15 MS. ARMSTRONG: It doesn't matter, housed  
16 or unhoused as long as they have a testable  
17 configuration.

18 MS. PETRILLO GROH: But I think that takes  
19 us back to the previous discussions about embedded  
20 products, I'm not entirely sure.

21 MS. ARMSTRONG: It wouldn't impact the  
22 embedded products as long as they had a testable



1 configuration first. If you are ultimately adding it  
2 to -- so it goes back to Bob's example that he just  
3 got up -- if I add Mike's unit from if you are  
4 looking at the screen to the right -- if I ultimately  
5 add that to an air handling unit or something else,  
6 it had a testable configuration already. It was  
7 tested, it was rated, it was regulated as a whatever  
8 that is -- centrifugal house fan.

9 It otherwise doesn't need to be rated in  
10 all the different options that may be offered in the  
11 field.

12 MR. FLY: This is Mark Fly with AAON. So  
13 any system effects that happen in application no  
14 longer matter is what you are saying.

15 MS. ARMSTRONG: I think it depends on if  
16 it's --

17 MR. FLY: It certainly simplifies the  
18 process.

19 MS. ARMSTRONG: The systems -- so that's  
20 up for discussion but we could argue that the  
21 systems' effects could be perhaps not considered for  
22 those fans offered as a testable configuration

1 period. Now for those that aren't we have to talk  
2 about system effects.

3 MR. WOLF: This is Mike Wolf here, let me  
4 go back to Laura's question. Laura your question  
5 specifically was related to housings so can you  
6 repeat the question?

7 MS. PETRILLO GROH: If I can remember back  
8 that far. I just want to see if the temperature that  
9 we were taking was for housed fans or embedded fans  
10 or bullets at this point because there has been --  
11 there are, at least on slide 51 you know, there are a  
12 few fans on that list as a possible scope of  
13 negotiations that are unhoused and I don't know then  
14 you know, I'm not intimately familiar with the  
15 testing of those fans in the unhoused configuration  
16 or how that plays into what we have been discussing  
17 now.

18 Is that a testable configuration as an  
19 unhoused you know axial unhoused, centrifugal  
20 unhoused.

21 MR. WOLF: This is Mike Wolf again and I  
22 hesitate to do this because I feel like we might be

1 making progress here but to the definition that I  
2 just heard you describe Ashley is okay if it is an  
3 testable configuration then that is all there is to  
4 it.

5 (Ms. Armstrong nodding yes).

6 MR. WOLF: Okay so feel free to jump in  
7 here if I am out of line anyone.

8 So I could take the scroll off from this fan and now  
9 it's an unhooded centrifugal fan which is one of the  
10 categories that we have I think here as an un-ducted  
11 --

12 MS. ARMSTRONG: It's on the next slide.

13 MR. WOLF: So an unhooded centrifugal fan  
14 is going to be the simplest, most basic what was the  
15 term you used Rob? Basic model I mean quite honestly  
16 that is the basic model for a good portion of what we  
17 do. So let me just stop and take the temperature or  
18 ask Ashley specifically is that what you were  
19 implying, because you just made this thing a whole  
20 lot simpler?

21 MS. ARMSTRONG: I don't think necessarily.

22 MR. WOLF: I didn't think so.

1 MS. ARMSTRONG: Yeah so I think it depends  
2 -- I would think I was defining testable  
3 configuration as inclusive of housing, right that I  
4 think that in order to test this thing, but perhaps  
5 you can correct me if I am misguided.

6 MR. WOLF: Okay so let's go back and  
7 where's our definition of housing.

8 MR. CATANIA: And Mike let me try  
9 something here. If you can also go back to the  
10 picture for a second -- and the general comment while  
11 he is bringing that up that I would make and this is  
12 Tom Catania from AMCA -- is you have to be really  
13 careful about trying to put people into gotcha  
14 language here and I'm arguing on behalf of Ashley a  
15 little bit here because when you are trying to do  
16 this thing on the fly, if somebody makes a very  
17 strong declarative statement -- are you saying "x"  
18 and then we start writing and then blah you know,  
19 this is a complicated industry and there's lots of  
20 complicated examples and so you can't declare victory  
21 for example if you know, in the press of the moment  
22 somebody says yes and then they have to come back the

1 next day and say oh well somebody explained to me  
2 three different variations here where this doesn't  
3 apply.

4           But in the picture that you had,  
5 to me what we are talking about here is with the  
6 exception of some specialized fans where the weather  
7 protection is so connected to the product that has to  
8 be tested that way but it doesn't perform any other  
9 function other than weather protection, in this kind  
10 of situation if somebody came up with a design that  
11 said you know, a pyramid shape is a lot better for  
12 rain redirection than a flat shape, we are certainly  
13 not contemplating that you would have to test you  
14 know, this configuration in the diamond shape rain  
15 protection versus the flag-shaped rain protection and  
16 so forth and it is only in the example you gave where  
17 you took otherwise the housing off the of product.

18           Now we are talking about a functional  
19 housing so I think -- I think that's the nature of  
20 the distinction that we are talking about here, not  
21 you know sort of this categorical definition. I got  
22 a little nervous with the way you said it because it

1     sounded very kind of "gotcha". If you commit to this  
2     then I have a whole series of things that I know that  
3     you have now agreed to.

4             MR. FLY: That was not my intention.

5             MS. ARMSTRONG: Yeah it's definitely not  
6     all systems right? I mean that's just clear. It has  
7     to do with what we defined as testable configuration  
8     it really comes on to those three terms. I don't  
9     think it's as simple as just a fan, an impeller let's  
10    put it that way. But I also don't think it's every  
11    application that a fan may be applied in the field I  
12    think we can simplify this, so.

13            MR. FLY: So this is Mark Fly with AAON.  
14    And you know part of what I am trying to get at  
15    thinking along the line of basic models which are  
16    embedded in my brain you know -- if I have a 15 inch  
17    unhoused plenum fan, is that a basic model or is that  
18    model different in the 5 boxes that I put it in?

19            Is that 5 models or 1 model and I'm not  
20    trying to get anybody, I'm just -- at the end of the  
21    day we have got to draw something explainable that's  
22    clear to anybody who was not sitting in the room

1 during all of this discussion to figure out what it  
2 is and so we need a lot of clarify here.

3 MS. ARMSTRONG: So I think it's hard to  
4 have that type of detailed discussion unless we  
5 actually agree to what types of fans we are talking  
6 about.

7 MR. SMILEY: Bill Smiley, Trane. If we  
8 say okay if you can pull the fan out of the  
9 application and test it by itself it meets one level  
10 of performance requirement. But if you test it in  
11 its application it needs to meet a different level of  
12 performance requirement? Because I assume that we  
13 are going to define at some point in time, here are  
14 the targets that we are shooting for it has to be  
15 this or better or why are we doing this.

16 If you pull a fan out and test it by  
17 itself and say okay use this fan because it's really  
18 efficient you have to stick that in the unit, you  
19 stick it in the unit and it doesn't work as well in  
20 the unit as a lesser efficient fan would work in the  
21 unit. Would you consider saying okay you can either  
22 test the fan by itself or you can test the unit by

1     itself and whichever is better or whichever meets the  
2     target, that's what you go into production.

3                   Because I think that can happen, I have  
4     seen it happen where you use a less efficient  
5     stand-alone fan in the application and it works  
6     better than a more efficient stand-alone fan in that  
7     same application.

8                   MS. PETRILLO GROH: I have a question.

9                   MS. JAKOBS: Do you mean for better that  
10    it uses less energy?

11                  MR. SMILEY: Less overall energy in the  
12    unit which is the whole goal, not just less fan  
13    energy but so what I am asking is how are the  
14    regulations going to apply in a situation like that  
15    because we don't want to have unintended consequences  
16    which that could push you into if you are not  
17    careful.

18                  MR. WOLF: This is Mike here again, I  
19    guess Bill let me just and I know we are way off from  
20    what I was proposing but I think what you are  
21    describing, you are back into the regulated  
22    discussion. If you have a product that does heating



1 and cooling -- okay right, but okay -- I'll try to  
2 summarize what I think I heard you say.

3 I think Greg you jumped on this this  
4 morning a little bit in our break-out session is I  
5 could have a fan just for discussion purposes, as one  
6 of these fan categories and to take Ashley's  
7 description and say okay we are going to define a fan  
8 as something that is testable, that's the term that I  
9 heard Ashley use. We have a testable configuration  
10 for that fan and that's what we are going to  
11 regulate.

12 If it's possible to take that testable  
13 configuration, let's take an unhooded plenum fan and  
14 I can have an unhooded plenum fan sitting here that's  
15 very, very efficient in a testable configuration but  
16 put it into something else that now directs the air  
17 differently at the inlet outlet and have that fan  
18 consume more energy than when it is tested in its DOE  
19 regulated testable configuration and that's the  
20 unintended consequence here. So --

21 MR. SMILEY: Yes, Bill Smiley with Trane,  
22 and to follow up further if you took a stand-alone

1 fan tested that was not as efficient as the one that  
2 you have just described and put it in the unit and it  
3 used less energy than the more efficient stand-alone  
4 fan did in that same unit.

5 MR. WOLF: So this is Mike again I'm going  
6 to kind of circle back here because I guess my  
7 question is, is that and I don't -- this is probably  
8 where we don't have the day, is that an isolated  
9 situation? I mean is that a very like move the dial  
10 type, if we do this we potentially create an  
11 unintended consequence using more energy than before  
12 this regulation?

13 MR. HARTLEIN: Hey Mike?

14 MR. WOLF: Yeah?

15 MR. HARTLEIN: Dan Hartlein, Twin City  
16 Fan. There's an assumption in this discussion that  
17 one of those fans is permitted by the regulation and  
18 the other one is not and I haven't seen much yet in  
19 this whole process that would suggest that that could  
20 be a problem. That's a functional level setting so  
21 if the levels are set and both of those alternatives  
22 are still available to the market, then that's maybe

1 some of the weeds that we can avoid, right? I mean  
2 it's not necessary.

3 Now I certainly understand your point that  
4 if fan A is regulated out of availability, out of  
5 existence and fan B is the only choice and yet it is  
6 consuming more energy we have done something wrong,  
7 obviously collectively.

8 MR. WOLF: Right.

9 MR. HARTLEIN: But I do believe that from  
10 what I have seen about where fan efficiencies are and  
11 where fans typically perform and the type of level  
12 settings that have at least been kicked around in  
13 this process through the discussions that we have had  
14 with the advocates, I don't believe that's a  
15 consequence, I don't believe that is going to happen.

16 MR. SMILEY: I've seen it.

17 MR. HARTLEIN: It's a functional level  
18 setting so.

19 MR. SMILEY: Bill Smiley, I guess the  
20 point I was making is are we going to be -- is to  
21 consider that potential situation so that we don't  
22 back ourselves in a corner that is not the right

1 corner to be in. I have seen it happen in the real  
2 world.

3 MS. MAUER: Bill this is Joanna. I just  
4 want to make sure that I understand when you are  
5 talking about a more efficient or less efficient fan  
6 are you talking about efficiency -- a best efficiency  
7 point or efficiency at the operating point?

8 MR. SMILEY: Bill Smiley, Trane. Either.  
9 Either, usually fans typically are not applied  
10 exactly at the best efficiency point.

11 MS. MAUER: Right.

12 MR. SMILEY: You like to do that but  
13 applications are not that definitive.

14 MS. MAUER: No I understand but you are  
15 saying that even if you are looking at efficiency at  
16 the point where you will be operating the fan.

17 MR. SMILEY: That's correct.

18 MS. MAUER: And when it's more efficient  
19 at that point versus one that is less efficient at  
20 that point.

21 MR. SMILEY: So all of those things I  
22 think would enter into it, yeah.

1                   MR. WOLF: So this is Mike again. So  
2 Joanna I think to answer your question a little  
3 differently and maybe to Bill's point to, the  
4 question is if I test this fan on the right by itself  
5 and then I put it into this component here, into this  
6 thing that directs the air into and out of the fan,  
7 if the performance is better here on the left -- am I  
8 saying that right? No, Bill you are saying it the  
9 other way aren't you?

10                   MR. SMILEY: Well either way.

11                   MR. WOLF: Either way. Well let's take a  
12 -- I'm trying to think of an example here. If it  
13 tests better in this configuration but then I take a  
14 fan that's say less efficient than this fan on the  
15 right and I put it in here and when I test it in this  
16 configuration it is actually worse in the installed  
17 or component -- right the extended equipment we have  
18 created an unintended consequence of taking a fan  
19 that's not efficient standing alone or it's deficient  
20 standing alone but then making it less efficient over  
21 here so again you are just trying to prevent an  
22 unintended consequence that we don't know. Again we

1 are speculating, we know that that condition exists,  
2 we just don't know how prevalent it is.

3 MR. FINE: Does anyone have an opinion as  
4 to what the data says? How likely is it that we  
5 don't have data sets or information to show whether  
6 this is sort of a hypothetical problem or a real one?

7 MR. HAUER: I would have an opinion.  
8 Armin Hauer. So this is apparently an air system  
9 right there's no heat coming through or anything  
10 happening here and its physics would defeat the idea  
11 that if you put the louvers to it that the system  
12 becomes more efficient is just not possible.

13 But then Bill's approach where he says  
14 okay in the heat exchange application, if you have an  
15 unfortunate inlet condition it's okay you put the  
16 more efficient fan in and then the overall efficiency  
17 drops, this might be possible if you have system  
18 effects. But here in this example it is impossible.

19 MR. WOLF: Greg?

20 MR. WAGNER: Greg Wagner, Morrison. I  
21 would agree with what Armin just said but you asked  
22 what percentage well virtually all of the embedded

1 products have a size constraint limitation put upon  
2 them by real world constraints i.e. building codes and  
3 other things require certain space and construction  
4 where you have a big range of buildings that exist  
5 today and they all have limitations on the space  
6 available.

7           So any time you put space constraints on a  
8 product you are limiting the ability to achieve  
9 infinite efficiency if you will because you are  
10 constrained by that space.

11           MR. FLY: Mark Fly with AAON. I think one  
12 of the things here that maybe we are talking around a  
13 little bit is when we are comparing fan efficiencies  
14 and the fan efficiency would drive us to a different  
15 type fan, that's for the applicability part of an  
16 embedded product to me would really matter. If I'm  
17 doing an unhooded plenum fan and I put a more  
18 efficient, let's say with same physical size to  
19 conform with my space constraint span in there most  
20 likely I am going to get more efficiency out of that  
21 combination likely.

22           But if I've got to switch to a house

1 centrifugal fan from an unhooded plenum fan driven  
2 just by a test configuration number because I have to  
3 meet some efficiency level, an application that could  
4 very well give me -- cause the end product to consume  
5 more energy.

6 MR. WOLF: Okay so this is Mike again.  
7 And Ashley do you want to go -- so I guess what we  
8 are back to I think, I'll jump in here is what's in  
9 the NODA today and again what we are talking about  
10 here AMCA has been kicking around for several months  
11 and it's a difficult topic. But to bring in a new  
12 term that hasn't been used before today, at least I  
13 haven't heard it is if we were to define for purpose  
14 of the regulation and what falls into the scope here,  
15 something called a testable configuration you know,  
16 if the basic level that we can -- the housing, the  
17 impeller, the drive and the housing and you know we  
18 might even need to tweak those definitions but it is  
19 basically a stand-alone thing that can move air, can  
20 we get to some comfort level that for regulation  
21 purposes that's our definition of a regulated fan.

22 And I guess Tom I am kind of going to



1 defer to you. I know it's difficult -- how do you  
2 move forward without getting somewhat specific on  
3 these questions? We don't want to back anybody into  
4 a corner to agree to something and then come back and  
5 say oh yeah but, I guess I don't know to what level  
6 details, but I will defer to somebody that has been  
7 through this process before if they want to step in.

8 MR. CATANIA: Well you know my sense is  
9 that I know when the AMCA discussions I don't think  
10 we got into as much depth on the significance of  
11 housings that have split functions, especially with  
12 regard to the configuration in which it is tested.

13 So I'm a little nervous and I'm looking to  
14 some of the other AMCA members here on this as to  
15 whether or not we really have you know, we are pretty  
16 confident in the definitions that have probably  
17 already been submitted, but this is kind of a new  
18 variation that I think there may be enough  
19 variability, especially with regard to how that  
20 product might be tested that we might have to caucus.

21 MR. HARTLEIN: You know a thought I would  
22 add to that, I'm sorry Laura did you want to go

1 first, I think your card was up first.

2 MS. PETRILLO GROH: It was but I want --  
3 you know I have had a little trouble following the  
4 discussions this morning when it was just based on  
5 card up so I was just sort of hoping that we could  
6 initiate discussion around a topic or moving on, so  
7 if your point is related to this --

8 MR. HARTLEIN: It's a contribution to  
9 Tom's point.

10 MS. PETRILLO GROH: Then you go ahead.

11 MR. HARTLEIN: Okay so what I was going to  
12 say was that we are doing things in slightly  
13 different order than we did in the AMCA room. So in  
14 the AMCA room we had a philosophical understanding of  
15 what likely regulation levels would look like.  
16 Frankly that got us -- this is Dan Hartlein by the  
17 way, sorry about that.

18 That got us substantially out of the weeds  
19 because many, many, many circumstances that we are  
20 talking about fall away with a reasonable setting of  
21 that target efficiency. If the number that we are  
22 shooting for is to be regulated, a fan has to hit a

1 total efficiency of 84%, there's a lot of people in  
2 this room that are going to say "oh crap, the weeds  
3 really matter."

4           If the target that we are looking at is  
5 somewhere just north of 50, there's going to be a lot  
6 of people in the room that say you know, okay let's  
7 get this done, right? It's easy. So it's a point of  
8 question as to whether or not what we are making,  
9 what we are doing much, much more difficult because  
10 of the order that we are trying to skin this cat.

11           So I just raise that as an open question  
12 to everything. It would feel differently I think, a  
13 lot of these discussions don't matter if the level is  
14 set appropriately and they do matter if they are not,  
15 so.

16           MS. PETRILLO GROH: Actually now my point  
17 is pretty relevant. This is Laura Petrillo Groh from  
18 AHRI. So you have been discussing levels and that  
19 helped you clarify things but I think from our  
20 perspective other than looking at certification  
21 reporting which becomes increasingly burdensome when  
22 you are -- when you don't know what configuration or

1    how many configurations that you have to report, just  
2    putting it out there.

3                   Enforcement is our difficulty because  
4    right now we are talking about fans.  But when we are  
5    talking about a fan embedded in a unit and you test  
6    that unit with the fan in it, it is not the fan that  
7    fails, it is the entire unit.  When you are looking  
8    at -- when cross referencing that with basic models  
9    of regulated products, what then comes off the market  
10   and why -- there are some fundamental problems we are  
11   having I think with this and I don't know if a level  
12   would solve that.

13                   MR. WOLF:  This is Mike Wolf.  Let me try  
14   to rephrase what you just said Laura is and I'm sorry  
15   I keep going back and trying to simplify this.  If we  
16   look at stand-alone fans and we kind of give the  
17   thumbs up that these categories cover stand-alone  
18   fans, and I'm going to guess that you know, maybe  
19   several of these categories, maybe unhooded,  
20   centrifugal you know, some of these centrifugal  
21   styles over here on the left side get used in AHRI  
22   products.

1           So one of the potential fears here is if  
2 we set the -- if we set the regulation at such a  
3 point that these fans get taken off of the market,  
4 they are no longer available for you guys and you  
5 know in the embedded fan and the regulated or  
6 unregulated product that can create a real world of  
7 hurt, correct? And that would be a big problem.

8           MS. PETRILLO GROH: I think yeah, anytime  
9 you are eliminating utility of any product it is  
10 going to impact someone. In this case if you  
11 eliminate the utility of a housed centrifugal forward  
12 bladed fan, you've impacted a lot of the AHRI  
13 members.

14           MR. WOLF: So I guess I'm going to kind of  
15 defer to Ashley on this. You know when I came into  
16 this and we probably all came into this with some  
17 thought of where we might end up at the end of today,  
18 I don't know if we are even going to be close to  
19 where I thought but you know I was of the philosophy  
20 or desire that we could agree on stand-alone fans.

21           So again the stuff that is in this picture  
22 okay, and you know from what I have heard here so far

1 we don't have maybe the data we need to evaluate  
2 embedded fans in regulated or unregulated products  
3 and there's maybe a question of utility, there's just  
4 a lot of questions that need to be answered. I'm  
5 just trying to figure out how we can move the  
6 discussion forward without getting in those weeds.

7           And again I mean AMCA has speculated on a  
8 lot of this stuff over the past several months and I  
9 know there is a concern that we don't want to agree  
10 to something in number one if it is going to impact  
11 number three, so Tom you look like you want to say  
12 something.

13           MS. PETRILLO GROH: Before that I would  
14 like to propose that we caucus for a few minutes.

15           MR. WOLF: Okay.

16           MR. CATANIA: Can I give you something  
17 Laura that you want that is directly related probably  
18 to some of this caucusing and stuff that you may be  
19 doing, I'm just guessing but I wanted to bring this  
20 up kind of at the beginning.

21           MS. PETRILLO GROH: Sure.

22           MR. CATANIA: Tom Catania, AMCA. The

1 general comment I would make about this is that this  
2 process to some extent gives this industry  
3 collectively the opportunity to make regulation in  
4 this area as smart and as balanced as it possibly  
5 could be. Now the other option is for you know,  
6 somehow Ashley and John to wake up tomorrow morning  
7 and say you know what I think we will try another  
8 product for a few years and then we will come back to  
9 this one, it's very complicated.

10 I don't think that's an option. So -- and  
11 I think that the Department, you know, a very good  
12 argument could be made that the Department has the  
13 authority to just proceed ahead in this area and you  
14 know, people are free to challenge it in whole or in  
15 part including in part with like you can't go after  
16 embedded fans in regulated products.

17 But my suggestion, you know I also have  
18 the infirmity of being a lawyer so I have to advise  
19 companies on strategies like this and I rarely kind  
20 of bet my reputation and my advice on winning in  
21 court on issues like this, especially when it comes  
22 to discretion of administrative agencies of the

1 government.

2           And so my thought would be that these  
3 extremely challenging questions that everybody in the  
4 industry faces is something we have to sort of  
5 embrace and say these problems are here, there are  
6 issues and we are going to propose a series of  
7 solutions that are data driven and we are going to  
8 figure out how to do this.

9           Because we have always got the right to  
10 reserve -- we always have the right reserved at the  
11 end to vote no at the end of this process and say you  
12 know we gave it that old college try where we ended  
13 up was unacceptable, we just can't vote for it and if  
14 our only remedy is the courts afterwards well that's  
15 the way it goes.

16           But I think that the attitude we all ought  
17 to collectively have going forward is to say that we  
18 are going to try to make this thing the best  
19 regulation it possibly could be because if we don't  
20 the Department I think feels compelled to act and it  
21 will and we'll get -- there will be a rule, there  
22 will be a notice of proposed rule one way or another



1 so that's where my head is at.

2 MR. BOSWELL: Okay so how long do people  
3 thing it makes sense -- 30 minutes is the request?  
4 Any objections to 30 minutes?

5 (Off mic discussion about break time  
6 talking).

7 (Recess)

8 MR. BOSWELL: I was just in the other room  
9 and I asked them to wrap up their conversations  
10 within the next four or five minutes and rejoin us,  
11 so hopefully we will be starting soon.

12 MR. BOSWELL: I have been in there and I  
13 have asked them to wrap up in about five minutes and  
14 it has not been quite five minutes so they should be  
15 in any minute.

16 MR. BOSWELL: Okay so it looks like we  
17 have everyone back. So I guess and I think I  
18 mentioned this to several people -- what I think it  
19 might make sense to do at this point is to hear from  
20 each of the kind of self-identified sub-groups  
21 within the room in terms of where their thinking is  
22 at this point, where they would like to see us by the

1 end of the day which is only about an hour away and  
2 where they would like to kind of options for moving  
3 forward.

4 And so Laura -- and I didn't say this to  
5 you since you had been the one who requested the  
6 caucus could I call on you to kind of start that  
7 discussion and I'm assuming there might be lots of  
8 reactions to what people are hearing but I would like  
9 to get through hearing from each group before we  
10 break into general discussion, okay?

11 MS. PETRILLO GROH: Sure thanks this is  
12 Laura Petrillo Groh from AHRI. We had a -- you know  
13 pretty lengthy discussion back at the luggage closet.

14 MR. SMILEY: And it's weedy in there.

15 MR. SHEARD: You have come out of the  
16 closet then.

17 MS. PETRILLO GROH: Yes, yes and now we  
18 are here. And you know there's been a lot of  
19 discussion thrown around but we do thoroughly intend  
20 to collect data. I want to make that clear so that  
21 we can look at what is going on in our products.

22 It's data collection and

1 trying to look at the situation as closely as possible  
2 and to what's already been done. I think it would very  
3 much help if we were able to have access to the data  
4 collection template with calculations but no data  
5 that AMCA has used to collect data for their  
6 database.

7           And we have a few questions -- you know we  
8 have a few questions about some of the assumptions  
9 that were made to collect that data so you know we  
10 could either see what's reasonable for our products  
11 or you know when you use it what would be more  
12 reasonable for our products. And there was a lot of  
13 discussion about housed versus unhoused fans and  
14 testable configurations that we didn't really get  
15 into and we would like to hear more about, because it  
16 sounds like there has been some discussion about this  
17 between AMCA members and the advocates that we  
18 haven't been party to that might help to bring us up  
19 to speed.

20           So did I miss anything members of my  
21 caucus? So that's how we would like to use the last  
22 hour but I understand there are other parties, thank

1 you.

2 MR. BOSWELL: Okay so and I didn't really  
3 ask the other groups if they had a spokesperson that  
4 they wanted to identify so the group that I kind of  
5 think of as around AMCA is there somebody that would  
6 like to speak for that group?

7 MR. CATANIA: Tom Catania, yeah I can  
8 probably handle this one at least with respect to  
9 those two questions. I think in general concept  
10 certainly sharing a template for collection of data  
11 is probably not going to be an issue among the AMCA  
12 members. I think that there might be sort of a  
13 little formal requirement to the extent that there  
14 were representations made to individual AMCA members  
15 about the confidentiality, the data and so forth, I  
16 think we just have to act consistently with that,  
17 Dan?

18 MR. HARTLEIN: Yes I just wanted to  
19 comment. This is Dan Hartlein. We also shared I  
20 believe that data with the DOE confidentially. I  
21 mean there's some pretty valuable U.S. market  
22 information represented there.

1 MS. PETRILLO GROH: We weren't asking for  
2 the data.

3 MR. HARTLEIN: Okay great.

4 MR. SMILEY: (Off mic).

5 MR. CATANIA: So as I said my assumption  
6 is other than complying with any agreement with the  
7 data providers that to the extent something is going  
8 to be disclosed, not necessarily even about the data  
9 itself but about the nature of how it is provided I  
10 think that AMCA will have to follow whatever it  
11 committed to do but you know in concept I don't think  
12 any of the other members see an issue with that.

13 And on the second question I think it's  
14 fair to say that even among the AMCA members issues  
15 around the housing and so forth were not discussed as  
16 robustly as we have started to get into them here so  
17 we might even have to have some of our own internal  
18 conversations about that. I don't see it as a bad --  
19 I don't think it would have fundamentally changed the  
20 analysis on you know the broad categories but we  
21 actually would want to have some internal  
22 conversations about that as well.

1           Do you know I think -- I wouldn't say we  
2           have a concern that we share but we have  
3           conversations of our own to have.

4           MR. BUBLITZ: Sorry I missed it, Mark  
5           Bublitz here, New York Blower Company. I think this  
6           idea of a minimal test configuration came out of  
7           today or yesterday so we need to wrestle with it but  
8           I don't believe there was a previous conversation  
9           with the advocates related to that subject, I just  
10          want to make that clear, thanks.

11          MR. BOSWELL: Okay, Ashley do you want to  
12          speak?

13          MS. ARMSTRONG: Oh I can take -- we can  
14          take complete credit for this whole testable convert,  
15          this configuration thing. It was not one that DOE  
16          had ever heard, it was something DOE completely made  
17          up in terms of terms and we are just trying to make  
18          sense of a very complex market and then DOE  
19          regulatory world and so we just make up things --  
20          make up terms for these categories.

21          Nevertheless I think you kind of hit the  
22          nail on the head and some of the discussions we have

1 had just like the sidebar discussions, we need to  
2 translate some of these I think categories -- in my  
3 mind, into what we call a DOE regulatory approach.  
4 And what that really means is definitions, equipment  
5 classes and then testable configuration.

6           What does that mean, what parts of the  
7 unit would you put together for each of those what I  
8 will call categories, equipment classes? I'm not  
9 sure that all of the categories will remain the same.  
10 I don't think we are changing the scope of those  
11 categories per se but we may be combining some  
12 because of the way our equipment class regulations  
13 work, so it's more of a translation of the -- what I  
14 would call advocate AMCA approach to date to what  
15 that means in DOE's regulatory context and then  
16 perhaps talking a little bit more in detail of what  
17 does that testable configuration mean for each of  
18 those what I will call ultimately equipment classes.

19           And I think once we do that DOE is going  
20 to take it upon itself to give it a first round. We  
21 are going to circulate that to the group well in  
22 advance of the next meeting. We can even go back and

1     forth by email or if you guys like share point I can  
2     get a share point site, whatever you want to do.

3             But I think that will help iron out some  
4     of the details, it's not going to be everything but I  
5     think the idea would be to figure out some of those  
6     finer details and then get together again at the next  
7     meeting and really decide can we move forward from  
8     here. Are we at a place where we can all agree that  
9     for these equipment classes, for this testable  
10    configuration we can strike a deal for these and move  
11    forward talking about more detailed versions -- more  
12    details about what the regs -- how the regs would be  
13    structured in terms of test procedures and levels.

14            That's not to say there won't be ongoing  
15    discussions for products that may be outside of those  
16    original equipment classes, DOE is not ready to  
17    forego those yet, but I think at the very least we  
18    need to find a subset of the group that we can  
19    actually make some progress on and make progress.  
20    Because the last thing that I want to do is go back  
21    to ASRAC three months from now and say, "yeah we are  
22    still talking about what's in the scope". They are



1 going to say DOE write your NOPR.

2           You know, that's not the intent of this  
3 and that's not why we are all here and that's not  
4 what DOE wants, let's be clear. DOE formed this  
5 Committee to do just that. You guys help us write a  
6 regulation -- a meaningful regulation for a very  
7 complex market and we mean that wholeheartedly.

8           So that's my -- that's my pitch. I don't  
9 know -- you guys should react to that, that's my best  
10 pitch so let us define some definitions, equipment  
11 classes, and this testable configuration idea or  
12 Ashley, whatever you want to call it and let you  
13 react to that a little bit.

14           And I think that might help with some  
15 things, but I really think it needs you know the  
16 Committee as a whole needs to be open-minded.  
17 Without that we are really not going to make any  
18 progress and I would hate for that to be the case.

19           MR. FERSTROM: And this is Gary I just  
20 wanted to make a quick comment to the extent -- this  
21 is great news, to the extent the template is shared  
22 and AHRI collects some data, that's wonderful. I

1 would encourage some attention to smaller equipment  
2 because when we the environmental folks opened our  
3 discussion with the fans people, we had in mind a  
4 lower limit and if we are going to consider fans that  
5 are utilized in unitary equipment, maybe we might  
6 want to look at equipment below one horsepower.

7 MR. BOSWELL: Laura?

8 MS. PETRILLO GROH: Responding to Ashley.  
9 Thank you, I think that looking at it in terms of the  
10 enforcement or DOE's enforcement language would be  
11 very helpful. Do you think that -- so the next  
12 meeting is on the 18th and 19th of May, I think that  
13 would help facilitate a lot of our conversations with  
14 our members and help us get to a point where we might  
15 be able to bring more proposals forward to the table.  
16 Do you think we would be able to do that before that  
17 next meeting?

18 MS. ARMSTRONG: So I think DOE is going to  
19 plan on circulating something next week, it's not  
20 going to be the end of next week, it's probably not  
21 going to be Monday given that today is Thursday. I  
22 think it is reasonable that we will probably

1 circulate something -- give us a couple of days but  
2 midweek right.

3 Now to the extent that you can get your  
4 members to get on the phone and start talking, I  
5 expect some feedback. Now whether you want to bring  
6 the feedback back to the meeting, whether people want  
7 to write back, I expect a lot of questions. Because  
8 the reality is we are going to use the DOE language  
9 and we are going to try to explain to you what that  
10 means, but it is just that, it is DOE language.

11 And unless you are engrossed in it like I  
12 am every day, it doesn't mean a whole lot to the real  
13 world. So it will come to mean a lot too, over time  
14 but like I said you should look at that as not  
15 necessarily DOE's opinion, that's going to be DOE's  
16 translation of where we are today and what this will  
17 look like in a reg and kind of some issues that we  
18 see, there may be some questions.

19 Honestly I think testable configuration is  
20 something that we are going to need some input from  
21 the manufacturers and so we will give it our best  
22 guess but the fan guys, the OEM, the embedded guys --

1 you guys are the experts so you should feel free to  
2 chime in with feedback, that's what this process is  
3 all about.

4 MS. PETRILLO GROH: Tom, do you think that  
5 we might be able to get the spreadsheet before  
6 Wednesday of next week?

7 MR. CATANIA: Yeah my assumption is that  
8 we can get whatever releases we need from the members  
9 very promptly so I'm just not anticipating any  
10 significant issues there. The other thing that I  
11 would say is that -- is one of the -- this is Tom  
12 Catania of AMCA by the way, one of the other  
13 admonishments I would give to all of us here, and  
14 this is such a challenge but the phrase that keeps  
15 coming to mind to me and we have referred to it as  
16 the weeds sometimes, but I think you know, we have to  
17 avoid making the perfect the enemy of the good here.

18 And we've all -- those of us who have been  
19 involved with product regulation over an extended  
20 period of time have seen all the imperfections that  
21 emerge over time, but the regulation of a product  
22 category typically doesn't start there and I wouldn't

1 say that we should expect a loose initial regulation,  
2 but I think we can make it almost impossible for  
3 ourselves to get to the goal line if we keep finding  
4 that isolated example after example where we can't  
5 quite figure out how that particular configuration  
6 exactly is going to be tested.

7 So we are going to have to all challenge  
8 ourselves to figure out how good is good enough in  
9 some of these areas and then know that over time as  
10 this becomes effective, we will fix it. The other  
11 thing to keep in mind is that there would be an  
12 extended period of time between any effective date of  
13 this regulation and this implementation date too.

14 I'm not encouraging us not to be diligent  
15 or careful or to be sloppy in any respect but we will  
16 just not get done if we constantly focus on trying to  
17 achieve the perfect regulation right out of the gate.

18 MR. BOSWELL: Just the one thing that I  
19 kind of would add on to Tom's comments is I think you  
20 remember where we started off yesterday talking about  
21 the consensus process was part of that process is  
22 usually a recognition that you don't end up with your

1 ideal but what you are striving for is something that  
2 everyone can live with and you are trying to reach  
3 consensus amongst a very diverse group in terms of  
4 what level you need for everyone to live with and  
5 move forward with, which I think is consistent with  
6 what Tom was just saying. So I'll add that as my  
7 infomercial.

8 Other thoughts?

9 MS. PETRILLO GROH: I think it also might  
10 be beneficial to go through the metric in more detail  
11 as it was proposed in the second NOPR.

12 MS. ARMSTRONG: Now?

13 MS. PETRILLO GROH: Sure.

14 MS. ARMSTRONG: We have a slide on it, you  
15 know are we talking really metric because the metric  
16 is just a function of you know, the fan with I would  
17 say the motor and controls -- it's a function of  
18 those green pictures that were on the first slide.  
19 It's really what I would call a system based metric,  
20 I mean that's all the metric is.

21 And I'm not sure the metric is so much of  
22 the issue as the regulatory approach -- at least what

1 I would call that. But what is it exactly that you  
2 would like to talk about with regards to the metric?

3 MS. PETROLLO GROH: There has been you  
4 know discussion of several different metrics and you  
5 know, whether it is the FEI, it's in this or the PBER  
6 which means the same thing as -- and I don't know  
7 just knowing a little bit more might help us be able  
8 to avoid some of the -- it's more about how the  
9 testing would work that you are looking at that.

10 MS. ARMSTRONG: So I'm going to do this in  
11 a high level type thing I think at this point and  
12 perhaps I'm going to do it mainly based on pumps.  
13 But part of this is that I think we will work through  
14 some of these finer details and I think they may be a  
15 little bit different for -- depending on which  
16 category we end up kind of talking about but you know  
17 the way we structure this was more of a system based  
18 type metric.

19 Now we have moved to something of like an  
20 index -- indexing, which is what we did for pumps.  
21 I'm not sure that's a foregone conclusion at this  
22 point we should have that discussion when we get

1     there about whether the index is the right way to go  
2     or we should just keep it as like more of a metric or  
3     a more conventional type metric I would say, you can  
4     feel free to add to any of this if you would like, if  
5     you want to, do you want to plug it in I don't know,  
6     do you want to use this or no? The next time right?

7             MR. JASINSKI: (Off mic) But I can kind of  
8     present them as --

9             MS. ARMSTRONG: That's fine.

10            MR. JASINSKI: This is Sam Jasinski from  
11     Navigant Consulting and Sanaee feel free to jump in  
12     if I mischaracterize anything. But essentially the  
13     index that Ashley was referring to is like she said  
14     something we took from pumps, but it is essentially  
15     the major factors in that are an energy consumption  
16     metric over a standard -- a target energy  
17     consumption.

18            And the energy consumption which AMCA and  
19     the advocates presented as PBER is equivalent to what  
20     we were calling FER in the second, the most recent  
21     NODA that was published. And FER is --

22            UNIDENTIFIED SPEAKER: FEI.



1 MR. JASINSKI: Yes but one of the factors  
2 used to calculate FEI was FER which is equivalent to  
3 the PBER which no longer exists. Anyway so ignoring  
4 --

5 MS. ARMSTRONG: This is why this metric  
6 discussion --

7 MR. JASINSKI: Right so ignoring the index  
8 for a second, FER is simply a function of the flow  
9 and pressure over the fan efficiency, transmission  
10 efficiency, but it also accounts for driver losses  
11 and control losses which allows for a wire to air  
12 metric.

13 MS. IYAMA: So in very simplistic terms it  
14 is just your electrical input power at a specific flow  
15 end pressure point, that's all and then compared to a  
16 --

17 MS. ARMSTRONG: So that's for discussion  
18 right, it's whether we index against the standard or  
19 not. Really that's a division.

20 MR. JASINSKI: Right and the only other  
21 thing I would add is that the metric allows for  
22 multiple scenarios depending upon which of the

1 components we have identified are there so you can  
2 use default values or test values to get to that.

3 MS. ARMSTRONG: So this is the one thing I  
4 think Dan eluded to in his beginning, some of the  
5 talk maybe at the beginning and something we did in  
6 pumps and perhaps a good exercise before the next  
7 meeting is to take a look at pumps because what we  
8 did there is if you don't have certain components  
9 that you would need for the full system, we would  
10 provide you with what I would call nominal values for  
11 you to be able to build up your full system metric  
12 from there.

13 And those nominal values are based on  
14 something like Dan said, in pumps we develop them  
15 based on a methodology that was more or less agreed  
16 to in the working group but it has also been tweaked  
17 in response to some things we know coming down the  
18 pike with regards to motor drive types. The motor  
19 stuff is based on our motor regs and scaling off of  
20 those for those that don't know motors.

21 I would envision a similar thing happening  
22 here, that's what we have done. You can also for

1 specific references to fan stuff, look at the AMCA  
2 white paper, that really describes it and I think  
3 that's what is implemented in the NODA.

4 MS. PETRILLO GROH: A quick question,  
5 Laura Petrillo Groh from AHRI again. So I think and  
6 please do so if I'm wrong, the goal for the pumps  
7 regulation was to improve the hydraulic efficiency of  
8 --

9 MS. ARMSTRONG: The goal of the pumps  
10 regulation was to improve the efficiency of the pump  
11 as defined by the working group, which is more broad  
12 than that. Now what they ultimately agreed to in  
13 terms of levels is reflective of something you can  
14 get by just improving the hydraulic efficiency.

15 But I wouldn't say that's necessarily -- I  
16 mean the goal was to -- if somebody wanted to do a --  
17 there's nothing in the level that says you have to do  
18 it by hydraulic efficiency, let's put it that way.  
19 If somebody wanted to do a wire to water test and  
20 needed by different motors or a different control  
21 system, they could very well do that.

22 They ultimately agreed to a level for

1    which DOE has subsequently proposed wholesale which  
2    could be met by just increasing the hydraulic  
3    efficiency, let's put it that way, I think that's the  
4    better way to say it.

5                   MS. PETRILLO GROH: Thank you.

6                   MS. ARMSTRONG: But it also allowed a  
7    system based metric. System based representations,  
8    system based label for which they ultimately wanted  
9    and system based incentive programs and I think  
10   that's important -- I can't speak for the fan  
11   industry, but I think that's important to the fan  
12   industry as well.

13                   That's like the high level metric stuff.  
14   I mean I will expect that we will get into the  
15   nitty-gritty details but if we can't get passed  
16   scope, we can't really get to metric and test  
17   procedure and levels so we are hoping that we can  
18   really get to the scope equipment classes, testable  
19   configuration into a happy place to move forward with  
20   some of the more finer details of the test procedure,  
21   the metric and then ultimately allow us to run  
22   different scenarios for you guys to consider in your

1 negotiating of standards.

2 MR. CATANIA: So I have a question, Tom  
3 Catania, AMCA. In the absence of you know, an  
4 agreement on scope or a successful outcome of this  
5 process would it be fair to say that DOE would look  
6 at something similar to this methodology to address  
7 what it saw as the scope of its authorized regulation  
8 and sort of a foundation of how it would approach the  
9 issue if left to its own device?

10 MS. ARMSTRONG: I don't think I can  
11 pre-judge the outcome of a proposed rule.  
12 Unfortunately I think what you have seen in the NODA  
13 is that DOE has implemented a regulatory approach  
14 that it thinks is workable with the DOE regulations  
15 and the statutory limitations as they exist. Now  
16 with that being said, there has been some feedback at  
17 this working group and to the extent people submit,  
18 you know, we didn't ask for specific comments on the  
19 NODA per se, we just said bring them to the working  
20 group, both members of the public and otherwise.

21 To the extent the discussions here would  
22 influence that but I think you have seen us issuing

1 the NODA is an indication but at least what we have  
2 done in the NODA the approach is something that we  
3 would consider as informing our proposal as a  
4 regulatory approach, but I can't prejudge the outcome  
5 of a NOPR.

6 MS. PETRILLO GROH: Ashley the other thing  
7 that we would ask you to start doing would be to  
8 start revising the LCC and all the accompanying  
9 analysis to include the impact on the HVAC OEM's.

10 MS. ARMSTRONG: And I think we are more  
11 than happy to start working on those types of  
12 revisions. We are going to need some data for you  
13 guys and some discussions about what that would look  
14 like in order to do that.

15 MS. PETRILLO GROH: What kind of data do  
16 you need for that?

17 MS. ARMSTRONG: We will get that. Let's  
18 start with data number 1, data request number 1.  
19 There's two --

20 MS. PETRILLO GROH: There will be two  
21 different groups working on it though I think it  
22 might be beneficial to work on it side by side.

1 MS. ARMSTRONG: Okay, that's fine.

2 MS. PETRILLO GROH: Okay we can work  
3 offline on that I suppose.

4 MS. ARMSTRONG: Sure.

5 MS. PETRILLO GROH: Okay.

6 MS. ARMSTRONG: So as we kind of come to a  
7 close of the first couple of days, I mean it's 4:15  
8 we do have 45 minutes to the extent we want to  
9 discuss -- I do think DOE needs a little bit of time,  
10 more than ad hoc trying to figure out this testable  
11 configuration thing any further, but is there  
12 anything else anybody wants to discuss while we are  
13 here and together before the next meeting?

14 One thing I will ask that I mentioned to a  
15 couple of people just as I was walking by, if you  
16 haven't looked at the NODA, please look at the NODA.  
17 If you haven't looked at the results, please look at  
18 the results, the data, the assumptions. If there is  
19 anything that you think we should revise, know that the next  
20 meeting would be the time to bring that to the table  
21 so that we could get working on another set of data  
22 and analysis to help the committee.

1                   These analyses can't be run overnight  
2 unfortunately so happy to revise them based on  
3 feedback by some additional data, based on additional  
4 scope, but please take a look at them.

5                   MR. HARTLEIN: Dan Hartlein, Twin City  
6 Fan. Ashley just a quick question -- I wonder if  
7 maybe that your Navigant team could comment on this  
8 but we had put -- we had differentiated between total  
9 pressure and static pressure and I noticed in the  
10 NODA that you don't. I just wonder if you could  
11 maybe pontificate or give us a little of insight as  
12 to why that was done, what your thinking was around  
13 that.

14                   MS. ARMSTRONG: Go ahead. Do you want to?

15                   MS. IYAMA: Can I think for a minute?

16                   MS. ARMSTRONG: You can think.

17                   MS. IYAMA: I mean okay, this is Sanaee.

18                   MR. HARTLEIN: We can park that for the  
19 next meeting if you want?

20                   MS. IYAMA: No I think in terms of the  
21 analysis, anything could be analyzed. In terms of  
22 the metric I think there is still not really a good



1 understanding of the justification for using static  
2 pressure for an un-ducted fan. It seems like most of  
3 the concerns we have heard from the industry were  
4 based on selection practices and installation  
5 practices rather than the performance of the product  
6 itself.

7 MS. ARMSTRONG: I think from DOE's point  
8 of view, it is really important to have a metric that  
9 can be comparable across classes. So this is going  
10 to become important when we talk about equipment  
11 classes and structure and to the extent the  
12 difference in pressure results in unequitable  
13 readings across classes I think we have some  
14 concerns.

15 That's not to say that levels can't be set  
16 at different -- meaningful for different classes --  
17 that's a completely different conversation. I think  
18 generally speaking though let's put it this way -- we  
19 haven't been convinced that from a regulatory  
20 standpoint from a regulatory metric standpoint that  
21 there needs to be that differentiation in pressures.

22 You don't have to answer it now, but you

1 can.

2 MR. WOLF: This is Mike Wolf, Greenheck.  
3 I will try to answer and others feel free to jump in  
4 here. I think the reason you know, part of it is the  
5 selection practice that is out there but the other  
6 part of it, to use the terms that we have kind of  
7 started to use today, testable configuration -- if  
8 you get an un-ducted fan, an un-ducted test  
9 configuration, you don't have the benefit of the  
10 velocity pressure at the outlet of that fan and  
11 therefore you have to use static pressure unless you  
12 make assumptions or you include some calculation  
13 regarding the outlet area of the fan.

14 And now if we want to start trying to  
15 define outlet area of the fan maybe we can back up  
16 and talk about proxy votes and all of that good stuff  
17 and again that was a joke for the record because that  
18 question becomes almost as complex as you know, it  
19 seems like it should be simple but it is not, so that  
20 was the reason we decided to go ducted and un-ducted  
21 and use a -- I'm sorry Greg go ahead.

22 MR. WAGNER: I would like to give a simple

1 example it helps with that discussion and then this  
2 came from one of your colleagues actually. When you  
3 look at an axial fan the external air flow coming  
4 from it, if I have an 18 inch or I have a 30 inch,  
5 the velocity pressure is going to look totally  
6 different between the two of them and it is going to  
7 look like that 18 inches is much more effective even  
8 though it is actually less effective in most cases  
9 than a 30 inch one in terms of the energy  
10 consumption.

11 But because you use the total pressure,  
12 you count the velocity pressure, that component would  
13 unnecessarily reward the 18 inch one.

14 MR. HARTLEIN: And Dan Hartlein. Quite  
15 the contrary, I mean yes I agree. In addition to  
16 that it actually leads to the unintended consequence  
17 of using more energy as opposed to less so that  
18 metric led to what we ran into in looking at total,  
19 is that actually in those products quite often  
20 resulted in the wrong decision being made from an  
21 energy perspective so we would ask you to go back and  
22 maybe look at that and if we need to put our ducks

1 back in a row and help with some more analysis, some  
2 more data then we would be happy to do that I'm sure,  
3 but that was the reason that we had to do it because  
4 we could not escape the unintended consequence of the  
5 wrong fan from an energy consumption perspective  
6 actually becoming the selected fan, so it gave us the  
7 wrong answer too often and we weren't anticipating  
8 that.

9 I think when we embarked on it as well, we  
10 were total, total, total until we ran into the  
11 situation but we would be glad to maybe share some  
12 more information there if it helps, okay.

13 MR. WOLF: I'm sorry Mike Wolf, can I just  
14 piggy-back on this thing. We actually attempted in  
15 our first pass at this to simplify it by just using  
16 static pressure because we wanted to keep it simple  
17 and to have a comparable across all products and we  
18 ended up seeing that was not right either, so.

19 MR. BOSWELL: Armin?

20 MR. HAUER: It's Armin Hauer. On the  
21 analysis of the second NODA I defined that the  
22 engineers from Navigant found that AMCA 210 indicates

1 that always the fan total pressure is determined  
2 first and then static pressure is calculated. But we  
3 -- now AMCA members, a few have realized that this is  
4 not actually the case. Most usually it is the static  
5 efficiency and static pressure that is measured and  
6 then on occasion you go the extra step in determining  
7 the total efficiency and total pressure.

8 So we are going to -- I put in a request  
9 to change AMCA 210 to amend it and then the second  
10 point regarding the NODA. I opened the big  
11 spreadsheet that engineering analysis and there are  
12 some missing links, it didn't open for me, I  
13 downloaded it twice, it didn't open for me --

14 MS. ARMSTRONG: We can check it out.

15 MR. HAUER: Thank you.

16 MR. BOSWELL: Ashley it sounded like you  
17 were going to respond to what Mike had been saying.

18 MS. ARMSTRONG: Well I'm not sure that we  
19 are going to come to a resolution on this today. We  
20 will go back and look at it. The NODA does it both  
21 ways, so that's something to look at. We have  
22 implemented ---

1 (Ms. Armstrong and Ms. IYAMA conferring)

2 So we have done it, the public versions  
3 with the total pressure I have just been told we have  
4 done it the other way if you guys want it for next  
5 week we can have that for the meeting. With that  
6 being said we should probably also make sure that we  
7 are understanding that the data elements that we are  
8 getting to pull are the actual data elements that we  
9 thought we were -- at least pressure is pressure,  
10 static is static, that kind of stuff.

11 But anyways, we can have those  
12 discussions, I don't think that's an issue.

13 MR. HARTLEIN: Dan Hartlein, just to kind  
14 of -- we 100% agree that we should can and will I'm  
15 sure, I just want to you know put a little  
16 exclamation point on that. This was really a  
17 contentious point for us. It was a long, long hard  
18 fought discussion with a lot of smart mind and  
19 several PhD's in the room before we actually landed  
20 on the fact that the reality was what we had to do  
21 here was get the right answer from an energy savings  
22 and that's what ultimately led us to where we were

1 so, but I'm sure that we can get to that with the  
2 data that we have so.

3 MR. BOSWELL: Okay good, thank you.

4 MS. ARMSTRONG: Anything else that anybody  
5 wants to bring up before the next slide? Oh you have  
6 a card up?

7 Do you want to do closing remarks from the  
8 podium? You did so well earlier.

9 MR. CATANIA: The last time he did that --

10 MS. ARMSTRONG: For his own proposal.

11 Well I mean I think in closing we would just like to  
12 thank you guys for coming for the past two days.  
13 Some of the past two days has been more productive  
14 than I think more enjoyable than others, but we are  
15 making progress. We have some homework and hopefully  
16 when we get together next time we can make even more  
17 progress and actually move to having a scope and  
18 having some definitions and having some workable  
19 equipment classes and really starting to talk about  
20 the details and move forward, okay, have safe travels  
21 home.

22 (Adjourned)

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