

TRANSCRIPT OF PROCEEDINGS

IN THE MATTER OF:)	
)	
COMMERCIAL UNITARY AIR)	Docket No.:
CONDITIONERS AND HEAT PUMPS)	EERE-2022-BT-STD-0015
ASRAC WORKING GROUP MEETING)	
DAY 1)	
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U.S. DEPARTMENT OF ENERGY
OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY

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Room 6E-069
Forrestal Building
1000 Independence Avenue, S.W.
Washington, D.C.

Wednesday,
December 14, 2022

The parties met, pursuant to the notice, at
9:11 a.m.

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1 So I know we have a few slides just to kick
2 things off. We should have done it all yesterday, but
3 I think most of the day will be spent in the term
4 sheet. But before we get to that, I'll turn it over
5 to Alison and the Department to walk us through the
6 outstanding items.

7 MR. WINNINGHAM: David Winningham, Lennox.

8 MR. FALTERMEIER: Okay. This is Sean with
9 Guidehouse. So on this slide we have our suggested
10 agenda for these next two days, and we'll see how
11 quickly we can wrap this up. I don't think I need to
12 read all this writing now, but it's consistent with
13 the agenda that was sent out yesterday.

14 And here we list the action items that came
15 out of the virtual meetings last week.

16 So first we can talk about economizer only
17 cooling air flow heating or fan power. So generally
18 mostly consistent with what we talked about last week,
19 and in our meeting, I think, on Thursday.

20 As we've been updating this issue to reflect
21 the latest analysis files from industry, we're seeing
22 a different trend in average air flow seen during
23 economizer only cooling as compared to the original
24 analysis we have done, which was based on many
25 iterations ago in the industry analysis, and many

1 things have changed since then.

2 There's a combination of changes in the more
3 recent analysis files likely contributing to this,
4 including the incorporation of over sizing, and no
5 longer filtering low loads, both of which are general
6 reducing loads, and having more hours in the D-bin.
7 Also the lower ventilation rates now being
8 incorporated in the analysis.

9 And so what we're seeing from this is that
10 in the C-bin -- this is still actually mostly
11 consistent with what we saw previously that the
12 average air flow as seen in economizer only cooling,
13 particularly with two-stage fan, is quite close to the
14 full load air flow. Most of the hours are at the full
15 load air flow since the average is just a little below
16 the full load.

17 The big difference is in the D-bin. We're
18 now seeing is that the average air flow is only
19 slightly higher than the minimum air flow, and so this
20 is just reflecting with the analysis update that seems
21 like there's just a lot more hours at lower loads,
22 such that the average is pretty close to the minimum
23 because most of the hours the load can be met at that
24 minimum air flow. And then there are no economizer
25 only cooling only hours in the D-bin.

1 Given these updates, we are recommending,
2 and updating, a similar approach to determine the
3 economizer only cooling fan power, and this would
4 eliminate the need for calculating an average air flow
5 on a model to model basis that would be between the
6 minimum to maximum to air flows, and also would no
7 longer require calculating an interpolated fan power.

8 Specifically for the C-bin, given that the
9 full load air flow is pretty close to the average we
10 see, we recommend just using the full load fan power.

11 And then for the D-bin, because the average
12 air flow is so close to the minimum, we're now
13 recommending just using the fan power from the low
14 stage D-bin part load test, which is for D-bin
15 consistent with industry's initial proposal for the C-
16 bin. It's different from integrated economizing. The
17 analysis is still built on the full load.

18 And then just as a note, for the C-bin
19 there's a pretty low number of economizer only cooling
20 hours. I don't remember off the top of my head, but
21 it was less than 100. So the vast majority of the
22 economizer only cooling hours are in the D-bin.

23 MR. TEAKELL: Hey, Sean. Kevin Teakell. I
24 think there's a lot of C-bin economizer only hours.
25 Like a lot. Like 1,300, or something.

1 MR. THARP: Rusty Tharp, Daikin. Dick, from
2 what you said in another email, 83.6 hours.

3 MR. FALTERMEIER: Yeah. I think regardless
4 of which iteration we're looking at of Dick's
5 analysis, I think it's a pretty low number. Less than
6 a hundred hours.

7 So any thoughts, questions, concerns about
8 this updated approach? This would be simpler than the
9 original approach we recommended with any analysis
10 updates. We're now thinking this may be the most
11 reasonable.

12 MR. ALATORRE: This is Mark with PG&E.
13 Given that update, is it appropriate to use averages?

14 I guess I'm just wondering what's the
15 overall impact? Like to be simple, is it a small
16 impact versus using industry analysis?

17 MR. FALTERMEIER: We're actually no longer
18 -- we're suggesting to no longer have averages at all.

19 So there would be no interpolation of fan power. So
20 the whole discussion we had about the exponent of the
21 cubic -- it's not cubic. Some deviation to the fan
22 models would no longer be needed because we're just
23 using -- directly using measured fan power from either
24 the full load test, or a D-bin test.

25 When I was mentioning the average, I was

1 just talking about in the analysis. We're simply
2 averaging the air flow used across every single hour
3 in the analysis just to see like what the average air
4 flow was to get a sense of what would be most
5 representative.

6 MR. ROBERTS: Any other questions, or
7 comments? Did folks want to take a temperature check
8 on this?

9 Okay. Thumbs up, like it. Sideways, good
10 with it. Down, problems. And then folks who are
11 joining on the webex feel free to type your vote in as
12 well.

13 MR. ALATORRE: This is Mark with PG&E. Can
14 we have a ten-minute discussion break to consider
15 this?

16 MR. ROBERTS: Ten minutes?

17 MR. ALATORRE: Yeah. Just to check in, I
18 guess.

19 MR. ROBERTS: Do I hear nodding? We'll just
20 do a few more slides.

21 MR. ALATORRE: Yes. And if there's other
22 issues, then we can caucus, and discuss them all at
23 once.

24 MR. ROBERTS: We'll just finish the slides,
25 and then take a break. Okay.

1 MR. FALTERMEIER: So I think up until the
2 opening analysis slides, we don't have many slides. I
3 think there's just like five, and then we can have a
4 break.

5 Okay. Next is reflecting the economizing
6 capacity in integrated economizing. We see there as
7 being two options of how to do this. The second
8 option we list is our interpretation of the email Dick
9 had sent of the updated manufacturer proposal.

10 So Dick, feel free to jump in if you feel
11 like I'm not correctly summarizing it.

12 The first option, which is what we discussed
13 in the previous meeting, was that the test procedure
14 would provide a target load of that would be -- I
15 don't think we fully named it. But I think it was
16 like percent load meaning mechanical, that would
17 reflect all capacity provided in mechanical only mode,
18 and integrated economizing mode, and that would have
19 included the economizing portion of integrated
20 economizing.

21 And then in the test you would need to
22 calculate Qimech based on the specific air flow, rated
23 air flow, of the unit under test to subtract the
24 integrated economizing capacity benefit. So that's
25 reflected in the equations at the top of the slide

1 where it's air flow, test 4.5 times output
2 differential, and then that's weighted by the ratio of
3 hours in integrated economizing.

4 An alternative approach is that the target
5 load in the test procedure would reflect the capacity
6 provided in mechanical cooling, and mechanical only
7 mode, and only the mechanical portion of integrated
8 economizing.

9 So essentially the integrated economizer
10 capacity benefit calculation would be done in the
11 analysis. And so you wouldn't need to calculate that
12 when you're testing a unit. And so we don't need to
13 calculate Qimech because Qimech would essentially just
14 be the target load in the test procedure.

15 And so in this case you would not be
16 considering variation in air flow from model to model
17 when considering the capacity benefit from integrated
18 economizing. However, I guess, in terms of capacity
19 benefit, I don't think currently we do that with the
20 current modes. We don't do that for economizer only
21 cooling either. So that's not necessarily a big
22 problem.

23 So these are what, I think, we see as the
24 two options, but I don't know if industry wants to
25 weigh in if we've correctly reflected their proposal

1 on option 2.

2 MR. LORD: Yeah. You did a good job on it.

3 I mean, it was basically simplified down to -- it
4 would be two mechanicals, one for integrated, one for
5 mechanical only, the loads.

6 So if you're doing integrated performance,
7 you'd have a percent load. If you're doing mechanical
8 only cooling, you'd have a different percent load
9 versus doing this on simple calculation. Either one
10 gets you kind of the same results.

11 And the other thing to weigh in too is the
12 integrated weighting is pretty small. So is it really
13 worth the effort to have it complex? That was our
14 thinking. But either will give you good results. Put
15 it that way.

16 MR. FALTERMEIER: Right. Yeah. I would
17 expect -- we haven't had time to run the calculations
18 to compare them, but I expect that you'd only see
19 probably any significant difference if a unit had like
20 an extremely high, or extremely low air flow.

21 I guess what you were saying, Dick, I'm not
22 sure entirely that you were saying separate target
23 loads for mechanical only in integrated. I think what
24 we were presenting here in option 2, we thought that
25 like the test procedure would specify a single target

1 load that reflects mechanical only, plus integrated --
2 mechanical portion of integrated economizing because
3 you're not going to have two tests. Right? It's just
4 one test.

5 MR. LORD: It's one test, but we have two
6 different percent loads because, if you think about
7 it, this equation is taking two mechanical less the
8 economizer benefit. So we just pre-did that
9 calculation. That's all we did. It's still two
10 different for percent loads.

11 If you think about it, an integrated mode
12 part of the capacity is being satisfied by the
13 economizer.

14 MR. WESTPHALEN: Right, but I think you need
15 the two percentages because one goes in the
16 numerator; the other goes to the power, the
17 denominator to determine what your tests are.

18 MR. FALTERMEIER: I think that's a separate
19 issue though because that's the -- the numerator term
20 is percent load, and all operating loads, including
21 the economizer only cooling.

22 MR. LORD: Yeah. This would be just for the
23 denominator. And if you use the same mechanical for
24 integrated, you would inflate power because the
25 compressor is not running more than it really is if

1 you subtract off for this equation.

2 MR. FALTERMEIER: Right. So the percent
3 load is not actually included in the calculation in
4 the denominator. It's just the target load for
5 testing. And so because there's only one test that
6 we're using to represent both integrated, and
7 mechanical only, there's just one target load.

8 MR. LORD: If you're going to do it that
9 way, then you have to do it this way. Well, because
10 you inflate the power by not taking credit for the
11 economizer benefit. You're going to inflate the
12 compressor power.

13 MR. FALTERMEIER: Right. So what we were
14 suggesting, what we thought was industry's proposal,
15 is that essentially you would do the integrated
16 economizer capacity benefit calculation just in the
17 analysis.

18 MR. LORD: But you have to have a different
19 percent load, or else that power is inflated. It's
20 probably not another test because most of those are
21 going to be degraded performances. I mean, down to
22 ten percent, no one is going to run a ten percent
23 test.

24 MR. FALTERMEIER: So I guess I'm not
25 following. I thought we previously agreed that it was

1 going to be just one test to represent both loads with
2 compressor operation, and that that -- the target load
3 for that single test for the bin, assuming your
4 interpolation, would reflect like average load in both
5 loads, like mechanical only, and integrated.

6 And I think that's what the previous
7 equation did was subtract in the integrated economizer
8 capacity benefit. In the alternative, would
9 functionally do the same thing. It's just you do it
10 in the analysis. So instead of reporting the percent
11 load in mechanical only, and integrated, you can
12 subtract out the percent load from integrated
13 economizing capacity in the analysis.

14 MR. LORD: Yeah. But how are you getting
15 the lower power then? Because you're basically --
16 your proposal is the same percent load for mechanical
17 and integrated. Ends up with the same power, so
18 there's no benefit to the integrated economizer.

19 MR. WESTPHALEN: I think we're back to where
20 we were last Wednesday when we had the shouting match.

21 MR. LORD: I mean, I'm not understanding
22 what you're trying to do. Is if you're taking Qimech
23 minus economizer, then what do you do with that?

24 MR. FALTERMEIER: So are you saying for
25 option one, or option 2?

1 MR. LORD: For your option.

2 MR. FALTERMEIER: Option one?

3 MR. LORD: Yeah. We now have capacity for
4 the integrated economizer, how do you get the power?

5 MR. FALTERMEIER: The power for the
6 compressor is the same in both modes.

7 MR. LORD: And what good does that
8 calculation do?

9 MR. FALTERMEIER: It reduces the total load
10 at the test that you use for both modes.

11 MR. LORD: Oh, so you're trying to reduce
12 the mechanical only cooling mode, which is probably
13 not appropriate.

14 MR. WESTPHALEN: No. This is trying to get
15 the average of mechanical only load and integrated
16 economizer mechanical load.

17 And remember what the integrated economizer
18 hours are only like about ten percent of the
19 integrated and mechanical.

20 MR. LORD: Yeah.

21 MR. WESTPHALEN: So I think you have like a
22 ten percent, and there's 15 percent in your slides.
23 There's no way it's going to go down to ten percent if
24 one-tenth of the hours are --

25 MR. LORD: Well, the degradation factor

1 would.

2 MR. FALTERMEIER: Yeah. So the idea is like
3 you could have two separate tests, and then if you had
4 two separate tests, then you would have two separate
5 target loads. But if you're not going to have two
6 separate tests, you only have one target load for the
7 test, and that target load should represent both
8 modes.

9 MR. LORD: I'm not sure you really have to
10 have two separate tests because the load is so low
11 it's going to be all degraded from the same test.

12 MR. RILEY: Pat Riley, Carrier. Sean, may I
13 make a suggestion that we talk about this during break
14 to see if we can get our heads wrapped around this,
15 and come back after break hopefully, and have further
16 discussion.

17 MR. FALTERMEIER: Yeah. Sounds good. Okay.
18 Next is part load cooling test return air conditions.
19 So I think we've had a little back and forth on the
20 temperatures coming out of EnergyPlus, whether those
21 are return air temperatures, or mixed air
22 temperatures.

23 And I think we're now moving back to the
24 temperatures being return air temperatures. And so we
25 just wanted to revisit this issue because with that

1 change, the analysis results on the return air
2 temperature are like a couple degrees lower.

3 So shown here on, I guess, the fourth column
4 of the table, it goes down to about 77 to, I guess,
5 mid-75-ish. And so the values agreed to during the
6 last meeting was 77 for all three tests. So I think
7 we just wanted to open up for discussion whether the
8 values should still be 77, or whether they should be
9 like a little lower.

10 MR. LORD: There is a lot of debate and you
11 and I have had a lot of discussions about this.
12 EnergyPlus, I think, it's hard to believe it runs the
13 space temperature for return air. We all kind of say
14 that's not really realistic. But that's what the
15 numbers say. I agree with the analysis, and it's a
16 debate.

17 I mean, there is some return air heating,
18 especially with overhead lighting. We pick up a few
19 degrees. That's one of the discussions we have with
20 the manufacturers. It was really only EnergyPlus
21 because it doesn't have very good return modeling.

22 MR. FALTERMEIER: Yeah. I kind of almost
23 see two sides of the issue where from one end I sort
24 of see that, and the results too a lot of times --
25 well, we're assuming return air temperature is

1 actually exactly equal to the set point, which seems
2 unreasonable.

3 But then on the other hand I almost wonder
4 how representative a set point of 75 degrees is, like
5 how many offices have a set point of 75. I imagine
6 men with suit jackets would not tolerate a set point
7 of 75.

8 So I don't really know. Maybe there's kind
9 of dubious parts of that on both ends. I'm not sure,
10 but I'd be interested if anyone has any thoughts.

11 MR. ALATORRE: This is Mark with PG&E. I
12 think early on there was kind of this set point
13 discrepancy between what was in DOE and EnergyPlus.
14 And I think we had agreed on the 77 to deviate from
15 the analysis. I think it was 77 to 64 what we agreed
16 upon.

17 MR. FALTERMEIER: I think that was referring
18 to the wet bulb when we were talking about the
19 discrepancy because the 77 was pretty close, but, I
20 think, industry was supporting a higher wet bulb than
21 the analysis was showing because they wanted to
22 maintain around 50 percent relative humidity.

23 So we actually are not even showing the wet
24 bulb. I guess we just kind of assume probably
25 regardless of the dry bulb industry would probably

1 want to maintain around 50 percent range.

2 MR. ALATORRE: I guess what I'm trying to
3 say was there was also some -- not alignment totally
4 across the bins on the wet bulb and dry bulb
5 temperature, and we agreed to make it all 77. So I
6 think we should -- at least from my perspective, keep
7 it.

8 MR. THARP: Rusty Tharp, Daikin. Similar
9 vein. I think where we've got to our prior agreement
10 of 77 is better, and more representative than what we
11 have today. And I don't think that it will be
12 significantly more representative by making further
13 tweaks. So I think I agree with 77.

14 MS. MAUER: This is Joanna. I guess I'm not
15 -- maybe I'm not understanding why we want to keep it
16 at 77 if the analysis is suggesting that a lower
17 temperature would be more representative.

18 MR. LORD: The other question is how
19 representative is the EnergyPlus model. That's the
20 discussion we've had. It doesn't have a very good
21 return duct model. So it's hard to believe the air
22 return space temperature. But then Sean argues that
23 is it really 75 and I don't know.

24 MR. THARP: Rusty Tharp, Daikin. I think
25 one of the thoughts running through my mind is that

1 whether it's 76, or 77, it's not going to change rank
2 order of any products, and where we're at is, again,
3 more representative. So I think because it's not
4 going to change the rank order of operation, that it's
5 okay to go where we're at.

6 MR. ROBERTS: Any other questions, or
7 comments, on any of the slides?

8 (Background discussion.)

9 MR. ROBERTS: Will we be taking a check on
10 this one, or do you want time to caucus?

11 Okay. We seem to be okay in the room with
12 the temperature check. So again, let's see where
13 folks are on slide 8.

14 And if folks who joined on webinar wouldn't
15 mind typing in. Ten thumbs up; two sideways.

16 MR. FALTERMEIER: Okay. Next we were
17 looking to see if industry, I guess, or John, had any
18 updates on the issue of split and return air ESP.

19 MR. RILEY: Pat from Carrier. So in our
20 discussions yesterday as far as tolerances for this,
21 what we came up with was a, in percentage terms, plus
22 0 percent the return air, static percentage minus 5
23 percent, and with a note that if there is no
24 additional restriction on the return duct, that higher
25 than 25 percent would be allowed.

1 MR. WINNINGHAM: So to be specific, what we
2 agreed upon was 75 percent of the static in return --
3 for 25 percent of the static in return, 75 of the
4 static in the return with a tolerance of minus 5
5 percent. So that would a bottom threshold of 20
6 percent.

7 But if there was a situation where the
8 typical duct static without any further restriction
9 was above .25, that would be allowed. We just tested
10 it for whatever it's at above .25 because there's
11 really no way to reduce it.

12 MR. WESTPHALEN: So just to be clear, what
13 you're saying is if you do a test in a side-by-side
14 room, and you have like an elbow bringing the air from
15 the indoor room. There might be that .25 pressure
16 drop.

17 MR. WINNINGHAM: Yes. We've done a little
18 bit of analysis, and we think that there could be some
19 products which cross that particularly on the lower
20 capacity sizes that have somewhat a lower static
21 pressure, which is somewhat going to be dependent on
22 your box size. You know, the highest capacity in the
23 box size is going to tend to have the highest return
24 statics.

25 And we haven't seen any, but because we

1 haven't run that among supply static, but we think
2 that it's possible we could pass that 25 percent
3 threshold.

4 MR. WESTPHALEN: And the box size affects it
5 because you're ducting at the same opening of the box.
6 And when you say the 5 percent, do you mean 5 percent
7 of the 25 percent, or 5 percent of the total?

8 MR. RILEY: So the test range would be 20 to
9 25 percent on the return static.

10 MR. WESTPHALEN: Okay, understood.

11 MR. FALTERMEIER: So was there any
12 deliberation on the industry side on provisions to
13 specify like precisely how you would perform the
14 restriction of return duct for repeatability?

15 MR. RILEY: No. I don't think we have
16 details behind that yet.

17 (Background discussion.)

18 MR. ROBERTS: Any other thoughts? Do you
19 want time to caucus on this, or are you okay to take a
20 check?

21 Folks want to take a temperature check on
22 slide 9? Thank you Joe. I think we have one
23 sideways, 11 thumbs up. Thank you everyone.

24 MR. WESTPHALEN: Okay. Here we have
25 additional discussion on the heating test. We had

1 some discussion about variable-capacity systems, and
2 the additional restrictions on compressor speeds, and
3 things like that.

4 And we were getting the feeling that this is
5 something that maybe doesn't need to be fully spelled
6 out for the test procedure term sheet because I think
7 some of the discussion revolved around -- you know, to
8 the extent that it affects the crosswalk to the
9 baseline. That's not going to involve variable speed.

10 And so that's something that maybe we don't need to
11 have nailed down.

12 So for the test procedure term sheet
13 obviously we would be thinking about in terms of
14 writing a notice of proposed rulemaking for the test
15 procedure, and we have the normal process of the
16 public rulemaking documents, and comment response on
17 that.

18 We'll give you the opportunity for feedback,
19 but just wanted to give the industry an opportunity to
20 see if they had any additional comments on this.

21 MR. ROBERTS: Any comments, or questions, on
22 heating?

23 MR. WINNINGHAM: Detlef, we discussed this
24 at length yesterday, and are still discussing it. You
25 know, I think the concept for both stage and variable

1 capacity for the high, low, and intermediate at a
2 specific setting is -- our general thoughts on this,
3 and the debate, discussion, is really around any boost
4 mode, and whether that is kept at a constant speed, or
5 if it's very kind of over its range.

6 And to also kind of think beyond just
7 variable speed boost mode, but are there other aspects
8 of the mechanical system that could be kind of brought
9 on and off. It's specific temperatures to make sure
10 that the test procedure kind of treats them all
11 appropriately. I think we're close.

12 MR. WESTPHALEN: I mean, is that something
13 that we will have, and be able to write into the term
14 sheet to finalize in a timely fashion, or is that -- I
15 mean, certainly, I mean, if DOE allows it, there would
16 be the opportunity for some additional information to
17 come in later that we could consider as NOPR.

18 MR. WINNINGHAM: Yeah. Probably some
19 further consideration and dialogue over today, and
20 maybe we circle back to this. But I can see both
21 sides of this. And for sure there's opportunity to
22 bring new information regarding this because we just
23 don't have a lot of data.

24 MR. WESTPHALEN: Okay. So to be discussed,
25 and move onto the next point. There are in the latest

1 term sheet a number of detailed changes, and we can go
2 over those when we run to the term sheet review.

3 Then an additional question that came up, as
4 you may recall in the term sheet draft, we had
5 discussion that the rated heating capacity measured
6 with a full load test. The question of what
7 measurements you need to make.

8 And ultimately that led to the discussion of
9 -- And I think we brought this up before of whether
10 the rated heat capacity should be a 17-F test because
11 that's more representative for what you would need in
12 a heating situation rather than the 47.

13 MR. WINNINGHAM: This is Dave from Lennox.
14 I think the industry needs to -- that wasn't part of
15 our discussion yesterday. So we'd probably like to
16 talk about that a little further before coming back.

17 MR. FALTERMEIER: This is Sean. Yeah.
18 That's fine. And I think actually it's not
19 necessarily a critical detail. It's easy to work out
20 in the test procedure term sheet because I don't think
21 it really affected the test procedure. It's really
22 more of a representation. It's just when you're
23 certifying radiant heat capacity which value is it.

24 So we're making sure that doesn't fall under
25 the radar. It's something to decide on eventually.

1 MR. RILEY: This is Pat. I just want to
2 make sure because energy conservation standards are
3 based off of cooling capacity, right?

4 MR. FALTERMEIER: Correct. Even the heating
5 standards are.

6 MR. RILEY: Okay. Just making sure.

7 MR. ROBERTS: Anything else on this? Are we
8 okay to move on?

9 MR. FALTERMEIER: Okay. So I think this was
10 our last slide. So we can take a caucus break after
11 this one.

12 It's related to an issue we discussed a
13 couple of times, and Dick had sent an email about the
14 consideration of VAV reheat in heating hours. So Dick
15 had presented two methods.

16 So one is using all heating modes, and two,
17 exclude the heating mode above a threshold that is 10
18 degrees above the changeover temperature for each
19 building.

20 And the idea there is to exclude heating
21 hours that at those higher temperatures are going to
22 be predominantly VAV, and would not be served by a
23 central heat pump. And so that's not included in the
24 heating mode line for heat pumps.

25 So I think right here in this table, I think

1 it's a copy of Dick's email, I'm not sure if you saw
2 my email asking you, you showed the difference in
3 hours, but not any difference in the outdoor air
4 temperature for each bin. Would that have some slight
5 impact on the temperatures for those lower load bins
6 as well?

7 MR. LORD: The way I do the outdoor air is
8 it comes from the blended building load profile. It's
9 not really from the analysis. So I take those
10 building load profiles, and merge them together. Then
11 come up with a weighted average after that. So it
12 would really not impact the temperatures.

13 MR. FALTERMEIER: Well, I guess it would
14 impact both profiles for the buildings. They could
15 average -- the weighted average.

16 MR. LORD: Yeah, but that whole building
17 load was below the changeover point anyway. Those
18 hours -- the 0 to 10 percent are -- you know, those
19 250 hours or so they have up there at 30 is all
20 heating that's like 65-70-degree in this. So they
21 really don't even show up in the whole profile.

22 So this extreme is really low loads for VAV
23 electric reheat.

24 MR. WESTPHALEN: Yeah. So I think what
25 you're saying is that instead of using the average

1 outdoor temperatures for each of the bins, you take
2 all of those average temperatures, and you do a code
3 fit.

4 MR. LORD: Yes.

5 MR. WESTPHALEN: And then based on that code
6 fit, you select the appropriate temperatures for the
7 bins.

8 MR. LORD: Yeah, basically that's the way I
9 did it. I basically made a load profile for the
10 building, and merged them together for the building,
11 and merge them again for the ten buildings. That's a
12 separate analysis that I sent, and I really studied
13 that, but we're saying the same thing.

14 MR. WESTPHALEN: Yeah. I understand what
15 you're --

16 MR. LORD: Yeah. You're correct.

17 I mean, the thing to remember about this is
18 that there was a lot of weight for that 0 to 10
19 percent. Either way, it's two thousand hours.

20 This gets back to EnergyPlus. I mean, some
21 of those models I look at all output. It's got heat
22 on it 95-degree ambience. It really should not be
23 running that way. You know, there's better controls
24 logic for VAV that would not allow that to happen, but
25 it's probably the way Energy Plus is modeling that

1 system. But they're really, really low loads. That's
2 a lot of hours.

3 MR. FALTERMEIER: Yeah. I mean, I think we
4 generally agree with your thought that, you know,
5 these are load certified VAV reheat, then that's not
6 something the heat pump would be serving.

7 I'm still a little bit confused about why it
8 would be reflected in the hours, but not the
9 temperatures, but maybe we can chat a bit offline.

10 I mean, as we've shown, it's not a
11 particularly significant difference overall.

12 MS. WILLIAMS: This is Alison from LBNL. We
13 were talking about stopping after this to caucus, but
14 I'm actually wondering if we should run through all
15 the LBNL slides. Also there's a couple that sort of
16 relate to this one. And then we'll be done with all
17 the slides, and you all can come back with all the
18 decisions. Sound good?

19 Okay. And Scott, and Katie, please, again,
20 chime in when I mess anything up.

21 So we did some updates, and finished our
22 analysis per request, and so we're going to just show
23 a couple different things.

24 The same thing we did last time. Shows a
25 little more notes on the slide, I think, about

1 actually how we did the weights for combining the
2 results. I'm not going to go into detail, but, again,
3 to note that the main difference, I think, is that
4 we're taking into account cooled floor space, and
5 capacity per floor space, which is not accounted for
6 currently in the industry analysis.

7 So this is the weights by building type. We
8 did show floor space weight because that's what we
9 showed last time, but here's the updated capacity
10 weight.

11 We'll send out these slides, so I'm not
12 going to spend too much time on these. You all can
13 look at them later. The same thing per last time. It
14 reduces the weight on the warehouse, and increases a
15 couple others like schools. And I forget what the
16 other one is now. Strip malls.

17 Climate zone weight also updated by
18 capacity. There's not quite a significant difference
19 between our calculations and industry's as there are
20 for building type.

21 And then really the more interesting thing
22 that we did is we got all -- actually, I'm not sure if
23 it's 150 buildings because we did the small office,
24 but something like that.

25 There, again, we didn't just do our counts.

1 We did system runtime, which is based on EnergyPlus
2 reports on fan runtime, and allocating to mode based
3 on cooling coil operation. So there's a little table
4 down here that basically says how we determine which
5 mode it goes into.

6 And so this is the comparison between LBNL's
7 distribution by mode and bin by runtime compared to
8 industry. And just to note, we think our runtime
9 comparison -- runtime methodology is most similar to
10 the industry hours methodology even though one is
11 hours, and one is runtime. I am not going to get into
12 the super details about why that is, but it's because
13 of how the things are calculated. So we don't think
14 our count one is appropriate to use.

15 So you can actually see there was a change
16 from the 15 or 16 to be 17 in the industry's analysis,
17 so there's actually a lot more mechanical only than
18 there was previously. So these two, the system
19 runtime, and the industry hours, are actually like not
20 super different right now.

21 This chart is just summarizing them in
22 numbers instead of hours, and just to note there's a
23 lot more hours in the industry just in total
24 regardless of where they're operated, and again, we
25 think that's because it's the difference in building

1 level analysis compared to system.

2 There's some simultaneous heating and
3 cooling going on in building level, but we don't have
4 at the system level. So we think that's why there's a
5 difference in hours.

6 So these numbers listed last time were
7 totally wrong. So apologies for that. We think these
8 ones are better, and I'm still a little shocked by how
9 close these are if you compare industry to LBNL
10 because there are a lot of differences.

11 And we are still using the economizer
12 capacity and integrated economizing from industry's
13 analysis rather than our own because we still need to
14 update that. So that might make a bigger difference.

15 But overall there just does not seem to be much
16 difference depending on what you use.

17 And then new for this time we did some
18 analysis of the heating load line, which is why I
19 wanted to mention it before break. So this is only
20 the central system, so it doesn't include any reheat.

21 So this is what we were just talking about
22 in industry analysis. There's a ton of heating hours
23 in the five percent bin, and our analysis has way
24 fewer. And again, we think that's the result of the
25 building versus system level analysis because in the

1 building level there's a lot more time when the system
2 is in heating. That's our suspicion anyway.

3 And then here's a comparison of the
4 temperatures. So ours are slightly lower across the
5 board. I'm not entirely sure why we think that is.

6 And then the last slide is just those
7 numbers, and this is the industry hours without the
8 reheat because that's most similar to ours.

9 So that's all the slides. We can send all
10 these slides out to you all to review during caucus
11 time. And we didn't calculate any IVHE, however you
12 say it, because we didn't have a chance. So we only
13 have the IVEC comparison. But, you know, except for
14 this five percent bin, it looks very similar across
15 the two approaches.

16 Any questions?

17 MR. LORD: Just a couple. Just
18 clarification questions. The IVEC numbers look high
19 to us, and you reflect the increased static. You
20 added crankcase heat. Was all that added in there?

21 MS. WILLIAMS: There's no crankcase heat, is
22 there?

23 MR. LORD: I think there is.

24 MS. WILLIAMS: Oh, there is? Okay. So you
25 can see here we ran -- we have multiple ESP results,

1 and the only ones I'm showing here are the ones
2 closest to what we agreed upon in this negotiation.
3 So those should be reflected.

4 Yeah. I mean, if you guys have your own
5 units, and are calculating different numbers, I would
6 probably trust yours. We're using old engineering,
7 and I don't know. I don't want to like compare. I
8 don't know. Take this with a grain of salt.

9 MR. LORD: What throws you off too is some
10 of your mechanical cooling will change due to the
11 lower return air temperatures, and the different test
12 points. So you have to kind of reflect that too. But
13 I understand where you came from.

14 The other thing I was going to point out on
15 your lower ambient. We get the ambients only when
16 mechanical cooling is running, so we exclude the hours
17 with economizer because we're really just trying to
18 define conditions for testing mechanical cooling.

19 I don't know how you got those numbers, but
20 something for you to look at.

21 MS. WILLIAMS: There's no economizing in
22 these ones.

23 MR. LORD: Okay. Okay. So you did it the
24 same way. Yeah. In a way, we've overridden it
25 anyway, so in a way it doesn't really matter because

1 we went to the 95/85/75/65.

2 MR. ROBERTS: Any other questions? Okay.

3 So here's the --

4 MR. RILEY: I'm just trying to -- so this is
5 probably a policy, or a process question, but we have
6 two different analyses now. Which one is going to be
7 used for what? I mean, do we have a clear
8 understanding on that?

9 MS. WILLIAMS: That's up to you all. Like I
10 said, we will use our analysis for the standards just
11 because we know it better, and there's other things we
12 need to do with it for standards.

13 But, yeah, you all can decide what you want
14 to use for this. The current draft numbers in the
15 term sheet are from industry's analysis. And I think
16 the reason we're showing it is just so people can like
17 compare the two, and see our main goal is to just
18 provide that on industry's analysis to make sure it's
19 in the right range.

20 So yeah, you all can -- I think basically
21 for the term sheet you just need -- the working group
22 can decide what numbers to go in. Yeah.

23 MR. LORD: Dick Lord. One comment. One
24 thing I did do was I used -- I ran my building's
25 ratings, and I ran your building ratings, to see how

1 significant it was. It changes the hours a little
2 bit. That's the data you could kick around.

3 I mean, I think your data is probably more
4 current than mine is.

5 MS. WILLIAMS: Yeah. It wasn't created
6 using IVEC so I don't think it matters, but, yeah.

7 MR. LORD: Yeah. It tweaked some of the
8 numbers, you know, 3-4 percent. Is that going to
9 really make a difference in the end? As long as you
10 were consistent. Yeah.

11 MR. ROBERTS: So barring any other
12 questions, or comments, before we head into caucus I
13 have a question for the whole group, I know that,
14 Mark, you had originally asked for ten minutes for
15 advocacy. Is it a fair ask to report not only on the
16 economizer piece, but also from industry on the
17 required optional heating test as well?

18 MR. ALATORRE: Yeah. Everything.

19 MR. ROBERTS: Because the idea is if we can
20 get temperature checks, and everything, we can move to
21 redlining the term sheet, and move to the thrilling
22 world of consensus checks.

23 So how much time do folks think they
24 realistically need to have a position on those two or
25 three outstanding slides, and issues?

1 MR. THARP: 43 minutes.

2 MR. ROBERTS: 43 minutes I'm hearing from
3 Rusty. Hold up your paddle if you want more. Okay.

4 How about this? It's 10, basically 10 right
5 now. Time check at quarter till 11:00, but there's
6 always the opportunity for more if folks need it.

7 MR. THARP: Yeah.

8 MR. ROBERTS: Great. All right. We'll meet
9 back here in at minimum 42 minutes. We can go off the
10 record now.

11 (Whereupon, a brief recess was taken.)

12 MR. ROBERTS: All right. Welcome back,
13 everyone. It is 11:30. Are we unmuted on the video?

14 Welcome back, everyone. Looking at the
15 caucuses, do we want to take a temperature check, or
16 finish the discussion on economizer, take a
17 temperature check, and then on the heating test, do
18 you want to just move right into the term sheet on
19 that?

20 I'm not sure if a temperature check is
21 really necessary, but you tell me, Industry, if you
22 prefer to do it that way.

23 Okay. So with that, are you ready to report
24 on where you are on the economizer?

25 MR. ALATORRE: Yeah. This is Mark with PG&E

1 We're ready to take temperature check on that.

2 MR. ROBERTS: Okay. So we'll look at this
3 one first, which is slide 6, using the updated
4 proposal for economizer only cooling air flow and fan
5 power.

6 If you all can indicate where you are with
7 your thumbs. So everyone is up in the room which is
8 eleven. Thank you Joe. So twelve up.

9 And then slide 7.

10 MS. WILLIAMS: So does anyone have a
11 preference for which option with the temperature side
12 problem?

13 MR. THARP: Two.

14 MR. ALATORRE: This is Mark. I guess I only
15 have a little more discussion on -- to understand what
16 was discussed in the manufacturer's caucus. I want to
17 make sure that we're all going to be voting on the
18 same thing.

19 MR. ROBERTS: I heard someone say use option
20 2. We just want to talk about our thinking on that
21 proposal right now.

22 MR. RILEY: This is Pat. I think our
23 thinking on option 2 it won't have very much impact on
24 the level of the metric itself. But greatly reduces
25 the complexity of the procedure.

1 MR. ALATORRE: Thanks, Pat. This is Mark
2 with PG&E. I guess I'm asking, Sean, if you'd
3 clarify. So between option one and option two, it
4 really is just two different ways of achieving the
5 same thing.

6 MR. FALTERMEIER: Correct.

7 MR. ROSE: Kevin Rose with NEEA. Sean, you
8 mentioned that you might have a chance to like fully
9 go over this before. I expect that you haven't had a
10 chance since you were talking with the two caucuses
11 for most of the half-hour. I just wanted to confirm
12 that you haven't had a chance to, you know, whatever
13 an hour ago when you first talked to us to look at
14 this further. It sounds like there's not much to
15 review, but I just wanted to have the most up-to-date
16 file.

17 MR. FALTERMEIER: Yeah. I was just thinking
18 about remembering what I said an hour ago. But, I
19 think, maybe what I said is we don't have like the
20 target numbers calculated already. You know, industry
21 sent this last night, this suggestion for option two.

22 But I don't think it should be that difficult.

23 And Scott has his iPhone code to be able to
24 calculate for all 150 tabs. So I think it's doable.

25 MR. WESTPHALEN: So I don't know if this is

1 necessary, because this isn't the term sheet, but the
2 parenthetical probably should say i.e., capacity
3 benefit subtracted in the analysis rather than as part
4 of the test proceeding.

5 MR. FALTERMEIER: Right.

6 MR. ROBERTS: Anything else on this, or are
7 we okay to -- go ahead.

8 MR. TEAKELL: Hey, Sean, when do you best
9 think you would have that number? Is that a week? I
10 don't know what that means.

11 MR. FALTERMEIER: Scott says he's working on
12 it right now.

13 MR. TEAKELL: Do you think maybe you could
14 have it tomorrow? Today? Okay. Great.

15 MR. FALTERMEIER: Yeah.

16 MR. TEAKELL: Just asking.

17 MR. FALTERMEIER: Yeah.

18 MR. ROBERTS: Okay. Taking a temperature
19 check on option 2 on this slide. I see one sideways,
20 ten up, in the room. Waiting on Joe. Okay, Joe is a
21 thumbs up.

22 Okay. Thank you all. I guess as we
23 transition to reviewing the term sheet, and offering
24 redlines, I think is what we're doing now.

25 (Background discussion.)

1 MR. ROBERTS: The only thing we have here as
2 a process element is the rules here on the consensus
3 checks, the rules change here slightly. There are 12
4 people in the meeting, so you would need 9 people
5 voting thumbs up, or thumbs sideways for an item to be
6 accepted into the term sheet. That's the only thing
7 to keep in mind here. As long as we keep the same
8 quorum of 12 people.

9 MR. TEAKELL: So up or sideways count?

10 MR. ROBERTS: Correct. Yeah. You don't
11 withhold consensus with this. This is just not my
12 first option, but not withholding consensus.

13 Any questions on that?

14 (Background discussion.)

15 MR. ROBERTS: Is it okay if we start with
16 the heating just because that might be the freshest
17 thing? No?

18 If you don't have a preference, we can start
19 from the beginning, or with heating, other than
20 Detlef. No strong opinions?

21 MS. WILLIAMS: I don't know if anyone
22 actually had time to review the term sheet updates.
23 But, I think, it would be easiest for me to accept
24 everything in here, and then we can redline, as we
25 discussed today? Does that work for people?

1 MS. HOOTMAN: Yes.

2 MS. WILLIAMS: Okay.

3 MS. HOFFMAN: Unless there's an objection,
4 we can start from the beginning.

5 MR. ROBERTS: Okay. So giving folks time to
6 review the first recommendation on cooling metric,
7 recommendation zero.

8 MR. RILEY: The only thing that we saw when
9 we were discussing it yesterday, early recommendations
10 was changed from "are" to "should be allowed". We
11 don't know if that is correct. We preferred it the
12 previous way.

13 MS. WILLIAMS: That's fine. They're
14 recommendations to DOE. So it really doesn't matter
15 either way, but happy to change it back.

16 MR. ROBERTS: Anything else on zero?

17 Okay. Again, the consensus works the same
18 way, just slightly different rules as to what's
19 actually adopted into the term sheet. But temperature
20 check are more informal. Whereas, this is actually
21 what's being adopted.

22 So unless there's any additional comments,
23 or conversation, on recommendation zero, if folks want
24 to indicate their support for recommendation zero as
25 cited here.

1 All right. I think all 12 are in consensus.

2 MS. ARMSTRONG: Can you go back up real
3 quick? Okay.

4 MR. CARRIER: All right. Recommendation
5 number 1. We'll probably ask for some support from
6 Mr. Lord back there. And I know this goes into a
7 conversation of which analysis is going to be used,
8 but as we were discussing yesterday, we found that in
9 the denominator of the equation, it might be double-
10 counting some crankcase heater power.

11 MR. TEAKELL: Kevin Teakell with AAON.
12 Maybe we discuss that when we get to the Appendix.
13 That's kind of where I think we see it better.

14 MR. LORD: The way I came up with the
15 crankcase heater hours, I took 80-65 hours, and
16 subtract it the cooling hours from it, but I forgot
17 the fan only hours. So I think we have accounted for
18 crankcase heater data only, and the crankcase heater
19 hours. So double-check me on that. So instead of
20 being like 4038, you have to subtract off the fan only
21 hours. Because you're putting the crankcase heater in
22 the fan control power for the term sheet. We can take
23 that offline and look at it.

24 MR. WESTPHALEN: And the 308 would be
25 unoccupied, no conditioning load.

1 MR. LORD: The fan only hours, but the
2 crankcase heater is in that, I think, the way the term
3 sheet.

4 MR. TEAKELL: Yeah. If you look at this, I
5 think HV includes power from crankcase heater.

6 MR. WESTPHALEN: Right. So then there are
7 hours where if you don't have the fan running,
8 basically you're -- for an unoccupied hour where
9 there's no conditioning load. Those are the 300 or
10 so?

11 MR. LORD: Yeah. But then you have all the
12 -- you're running gas heat. You're running gas heat
13 with the crankcase heater still on. So the fan power
14 is in the -- it's in the heating sizing metric.
15 That's where the 4,230 hours come from.

16 MS. WILLIAMS: So there's a crossover of
17 hours between the cooling side and the heating side.

18 MR. LORD: Yeah. You use double counting
19 because when I calculated that, 4538 I forgot the fan
20 only hours.

21 MR. FALTERMEIER: We'll take a look.

22 MR. ROBERTS: Is it still okay to take a
23 consensus check on 1?

24 MR. TEAKELL: Kevin Teakell. One other
25 thing. On that equation, we've got the brackets

1 around that summation. Does the left bracket in that
2 need to be to the left side of the summation? I'm not
3 sure.

4 MR. FALTERMEIER: I don't think there's --
5 there's nothing being multiplied by that summation.
6 So it was just trying -- the brackets are trying to
7 show what all terms are encompassed inside.

8 MR. TEAKELL: Right. I just want to make
9 sure someone doesn't interpret ventilation and
10 crankcase heater as being inside that summation.

11 MR. FALTERMEIER: Right. The intent of the
12 brackets was to --

13 MR. TEAKELL: Yeah. I know what the intent.
14 I want to make sure that's mathematically correct.

15 MR. RILEY: I think it's laid out
16 differently in one of the --

17 MR. TEAKELL: Yeah.

18 MR. RILEY: -- formulas later in the term
19 sheet.

20 MR. TEAKELL: Yeah.

21 MR. RILEY: The summation is bracketed.

22 MR. FALTERMEIER: Also, we could put the
23 other terms in front of the summation.

24 MR. TEAKELL: Yeah, put them in front, and
25 then that would make it very clear.

1 MR. FALTERMEIER: Yeah. That's a good
2 point.

3 MR. TEAKELL: I think that's how we did it
4 in heating.

5 MR. WESTPHALEN: Why don't you just put a
6 comment saying how it will change because if you try
7 to do equations, you might -- oh it's working, fine.

8 MR. ROBERTS: Anything else on
9 recommendation number 1?

10 Okay. Let's take a consensus check on it.
11 I see 11 -- I think 11 up in the room. And thank you,
12 Joe. Twelve up.

13 All right. Recommendation number 2. Any
14 questions, or comments?

15 MS. MAUER: Those is Joanna with ASAP. So I
16 think this gets to the question of are we using the
17 industry analysis, or the LBNL analysis for the hours.

18 And I think the industry analysis has been
19 enormously helpful in all of these discussions, and
20 it's really good that we've ended up in a place where
21 the industry analysis, and LBNL's analysis seem to be
22 converging.

23 It seems to us that the -- the major
24 difference is that the industry analysis uses this
25 building level approach, while the LBNL analysis uses

1 the system level approach. It seems like the system
2 level approach is an improvement. And I think we
3 agree based on the table that Alison put up this
4 morning that at a high level there doesn't seem to be
5 major differences between the two.

6 However, given that the approach of the
7 system level analysis just seems to be more
8 representative, and the fact that -- I think it's just
9 hard for us without having a lot of data.

10 I don't think we know, for example, you have
11 two units with the same IER level, but that get there
12 in different ways. One, you know, more through
13 compressor efficiency, one more through fan
14 efficiency. You know, how does that play it out?

15 And So I think our preference is to use the
16 LBNL analysis since we think that that's more
17 representative.

18 MR. WINNINGHAM: This is Dave with Lennox.
19 I guess at this point we don't have enough information
20 regarding the LBNL analysis to come to that same
21 conclusion. We've invested a lot of time and energy,
22 and have an understanding of the analysis -- and given
23 that we've only really seen this for a very short
24 period of time, we can't come to that same conclusion,
25 and would recommend that we proceed with the industry

1 analysis.

2 I recognize that Alison's comparisons show
3 that there was not a lot of difference between the two
4 numbers, but at this point we don't have evidence that
5 support -- we don't come up with the same numbers
6 using our analysis, and the formula that was agreed to
7 has kind of been our assessment. And we don't really
8 have enough information to do kind of that comparison
9 at this point.

10 So it would be our recommendation that we
11 proceed with the proposal as stated on the screen, and
12 we are very concerned that we just don't have enough
13 time to build the bridge to fully understand the LBNL
14 analysis.

15 MS. SKIDD: This is Allison from Rheem. I
16 guess just to build on what Dave was saying, the
17 table, I think, on slide 20, does show that the
18 calculated IVEC doesn't differ that much. But that
19 didn't quite feel intuitive based on the significant
20 change in hours.

21 But we didn't have the time to test that
22 intuition to see if there's a double-check needed, if
23 we could validate that there isn't a big difference.
24 So that's where the remaining concern is.

25 MS. MAUER: This is Joanna. And I certainly

1 appreciate the challenge of trying to evaluate things
2 without having a lot of time to spend with it. I
3 guess I would raise the question perhaps of -- so
4 we're at the point, I think, where we do have two sets
5 of numbers. Do we need to make this decision right
6 now, or can we let folks kind of try to better
7 understand the LBNL analysis, to understand what it
8 means in your equipment.

9 MR. WINNINGHAM: I guess from the
10 manufacturer's perspective, this is critical. Between
11 now and our standards negotiation, we need to take
12 what we've agreed to, and exercise it in with data.
13 And maybe conduct testing to evaluate where we kind of
14 start with our energy conservation standards
15 discussion if we leave this open-ended, and if we find
16 that there's different results, I don't know that the
17 manufacturer is going to have -- you know, we would
18 need a lot more time because we think this is critical
19 to bringing the test procedure to a conclusion.

20 MS. MAUER: This is Joanna again. I guess
21 just so I understand Dave, this isn't going to affect
22 your test results, right? So once you have testing,
23 it's pretty simple to calculate IVEC using the guide
24 on the screen, or you can calculate how the IVEC using
25 LBNL's hours.

1 I guess I'm just trying to understand like
2 is it really -- is this really the -- because the
3 hours are the critical piece. I understand there's a
4 lot of evaluation you guys need to do, and the impacts
5 on your equipment, but is this really the key thing,
6 especially if we have the two sets of values, or is
7 that really just like a spreadsheet task?

8 MR. WINNINGHAM: I think as far as a
9 manufacturer's perspective, it is critical. I mean,
10 what may seem like a trivial task in kind of where all
11 of our businesses are at, the energy spent between now
12 and when we start the standards negotiations,
13 resources are just at a critical premium. And I can't
14 over-emphasize that. So it would very much be our
15 recommendation that we try to finalize these.

16 MR. TEAKELL: Kevin Teakell with AAON.
17 Yeah. And right now we don't know where to run the
18 test because without that Qimech equation, that's what
19 tells us where to run the test. So we don't even have
20 that yet.

21 MS. MAUER: This is Joanna. Is that related
22 to hours?

23 MR. TEAKELL: It's related to the whole
24 analysis. I mean, that all comes from that analysis.
25 It's all part of it. It all goes together.

1 MR. FALTERMEIER: So I guess maybe a point
2 of clarification to Kevin's point is what is on the
3 table here. Are we talking about -- would the
4 advocates be suggesting using the hours from LNBL's
5 analysis, and everything else comes from the
6 industry's analysis still. So other than the hours.

7 MS. MAUER: I guess that was my
8 understanding of what the choice was. Maybe I'm not -
9 -

10 MS. ARMSTRONG: We're talking hours alone,
11 you can test -- regardless of which hour bucket we end
12 up doing multipliers on is not going to affect it.
13 You can test.

14 MR. TEAKELL: These hours go into
15 determining these other ways.

16 MS. ARMSTRONG: So there's downstream
17 calculation that would change. I agree with that. It
18 would change your reading. But we can fundamentally
19 test by comparing the test procedure today, and then
20 new testing part of the test procedure, and then the
21 downstream calculations would be different.

22 MR. TEAKELL: The Qimech tells us where to
23 run the compressor.

24 MR. FALTERMEIER: So I think based on what
25 we're just saying that I don't think anybody is

1 floating the possibility of determining that from an
2 LBNL's analysis.

3 MS. SKIDD: Correct.

4 MR. TEAKELL: So we're going to mix
5 analysis?

6 COURT REPORTER: Is your microphone on? I'm
7 sorry. I'm not picking up what you're saying?

8 MR. TEAKELL: I mean, we're going to mix
9 analysis.

10 MS. WILLIAMS: This is Alison. I think a
11 lot of other things like the temperatures are you
12 rounded, right? So it doesn't matter that much which
13 one you're getting them from because they're not
14 directly from it. I think it's fine to keep separate
15 the hours, which are just how you weigh bins versus
16 things like Qimech, and temperatures.

17 MR. LORD: Just to back up what Kevin said.

18 The weightings that we used to determine the test
19 points, so based on ton hours to change the hours. So
20 the ton hours now change. So instead of being, say,
21 15.5 percent, it might be 20 percent. And the hours
22 change significantly, so that's going to have a big
23 impact.

24 MR. FALTERMEIER: So to clarify your point,
25 that Qimech would be dependent on, say, on how many

1 hours, or integrated economizing, because that's a
2 function that's going into calculating Qimech, and
3 that is a number that you would need before you test
4 them.

5 MR. LORD: Yeah. If you look at the
6 details, you know, there's a big -- it depends on
7 which of the LBNL proposals we're using, you know,
8 whether it's the runtime, or the hour count.

9 MS. WILLIAMS: So this is Alison again.
10 We're recommending using runtime, and there's not very
11 much difference between the IE hours in industry
12 versus runtime.

13 MR. LORD: There's a huge difference like
14 look at the economizer only.

15 MS. WILLIAMS: Are we talking about --

16 MR. LORD: It goes from 1,871 to 1,828
17 hours.

18 MS. WILLIAMS: Integrated economizing then?

19 MR. LORD: That's going to impose weights on
20 things. Mechanical cooling changed from 1,370 to 370.
21 That's a huge difference.

22 And I think, Alison, part of yours is I know
23 what you're trying to do is runtime which was based on
24 heating control scenario. So that may have an impact
25 on it too. If you have a two-stage unit, it's going

1 to cycle more than at variable speed unit.

2 MS. WILLIAMS: Okay. Maybe Sean and Detlef
3 can tell me if I'm wrong, but, I think, for the
4 Qimech, isn't it only the economizing member?

5 MR. FALTERMEIER: No. It's reflecting the
6 load in the mechanical only, and integrated economizer
7 counts.

8 MR. WESTPHALEN: Yes. So those are --
9 you're basically averaging over all those hours. The
10 distribution of the loads, but within the C-bin or the
11 D-bin, you're going to get an average.

12 MR. ROBERTS: So why don't we pause on this
13 one for now. Whether or not additional caucus time
14 bears out new points of view remains to be seen, but
15 at least -- well, it is noon right now.

16 So we're going to hit pause on this on
17 reviewing of the term sheet, and then come back in an
18 hour, or do you folks want more time to discuss
19 recommendation 2 in caucus?

20 MS. SKIDD: This is Allison from Rheem. I
21 think I'm questioning whether much will change in an
22 hour from the industry standpoint.

23 MR. ROBERTS: So, folks, with a truncated
24 lunch period because there is not substantive caucus
25 discussion needed. You know, grabbing a bite to eat,

1 and then coming back to pick up review, but with
2 recommendation 3.

3 MR. FALTERMEIER: So I had just one quick
4 thought related to question two, but not related to
5 which analysis we used, just in case anyone wants to
6 think about it all, because I don't think we discussed
7 it when we were discussing the bin boundaries. But it
8 was occurring to me recently how unit hours are in the
9 B-bin as compared to the C and D-bins. I think it is
10 five percent of the hours.

11 So maybe nobody has any issues with that,
12 but since the bin boundaries are flexible, and very
13 easy to change, I don't think we want to decrease the
14 C/D-bin boundary anymore because that would lower the
15 target load for testing.

16 But, I think, if any of them was concerned,
17 and wanted the D-bin weighted heavier in reducing
18 C/D-bin boundary, it would be pretty easy to do.

19 MR. TEAKELL: Kevin Teakell. Yeah. It's
20 low hours, but it is pretty high power.

21 MR. LORD: Dick Lord, Carrier. One thing to
22 consider is if you drop the D-bin down, that brings
23 that target load down, which everybody may end up
24 running low speed then at all times, you know, is it
25 going to pick up the high speed fan. That was part of

1 our reason for trying to keep it around 75 percent.
2 It's a discussion we'd have to have.

3 MR. FALTERMEIER: Well, I mean, if there's
4 no issue, then move on to what's next on the term
5 sheet.

6 MR. ROBERTS: So, I guess the question do
7 people want to keep running through the term sheet, or
8 do people want to stop right now?

9 MR. ALATORRE: This is Mark from PG&E. I
10 propose we finish the cooling recommendation. We've
11 got only two more.

12 MR. ROBERTS: Three more. All right. So
13 moving on ahead, I think we're at recommendation 3,
14 IVEC. Thoughts, comments, questions, on 3?

15 MR. ROSE: Kevin Rose, NEEA. A point of
16 process, I guess. Will we be voting on the substance
17 of the appendix? Because that's referenced in a
18 couple of places here since that is sort of integral
19 to this recommendation. I just want to make sure that
20 we're going to do that.

21 MR. ROBERTS: Yeah. I think the answer is
22 yes. I mean, at the end of this we'll vote on the
23 entire content of the term sheet. So you know, kind
24 of get two bites of the apple.

25 MR. FALTERMEIER: Also, I'd just note that

1 the first sentence in the third paragraph would change
2 by using option 2. You wouldn't need to calculate the
3 target load in the test procedure. You would just
4 specify Qimech. I guess we could say test at the
5 target load specified in the test procedure.

6 MR. ROBERTS: Any other questions? Okay.

7 MR. WESTPHALEN: So maybe a technicality,
8 but test procedure would not specify target loads. It
9 would specify percentages of the -- presumably test
10 capacity, right?

11 (Background discussion.)

12 MR. WESTPHALEN: If it's too much of a
13 technicality, then feel free to ignore me.

14 MR. ROBERTS: All right. With those
15 reviews, are people okay to take a consensus vote on
16 recommendation 3?

17 MR. ALATORRE: Mark from PG&E. I guess we
18 did have this discussion in our caucus about how to
19 determine minimum air flow, and I see it referenced
20 here. Using air flow specified by the manufacturer,
21 and the S.T.I., is that sufficient to put the
22 framework as we were discussing?

23 MR. FALTERMEIER: I think that is something
24 that is lower in the term sheet. We haven't
25 implemented it yet, but we were discussing -- the

1 minimum air flow provision is later in the term sheet.

2 MR. ROBERTS: Okay. If folks wouldn't mind
3 indicating their thumbs on this. Eleven up in the
4 room. Thank you, Joe.

5 All right. Recommendation 4 on load
6 parameters and test conditions.

7 MR. FALTERMEIER: So the percent load
8 mechanical numbers will change.

9 MR. LORD: Dick Lord. That's based on the
10 option 2 approach. So we'll reevaluate those numbers.

11 MR. FALTERMEIER: These numbers are based on
12 you subsequently subtract it.

13 MR. LORD: That isn't going to change much,
14 but I agree with what you're saying.

15 MR. ROBERTS: Any other questions, or
16 comments?

17 MR. TEAKELL: Kevin Teakell. So do we vote
18 on this without any of these numbers? I'm a little
19 uncomfortable with that myself.

20 MR. ROBERTS: Do you want to see the changes
21 reflected from option 2 before --

22 MR. TEAKELL: That's what I'm saying.

23 MR. ROBERTS: All right. So we'll hit pause
24 on 4 as well.

25 Can we move on to 5? Any questions, or

1 comments on 5?

2 All right. Consensus check on
3 recommendation number 5. Eleven up in the room. And
4 thank you, Joe. Twelve up.

5 And last on cooling, recommendation 6.

6 MR. FALTERMEIER: Yeah. So this is where
7 the minimum air flow issue is. It's also in the
8 heating provisions I think separate.

9 MR. ROBERTS: Questions on 6?

10 MR. ALATORRE: Mark with PG&E. I guess
11 understanding where the 24 percent came from, you
12 know, from version 17, but what changed in that
13 version to reduce this to 24, I think we last had
14 agreed at 29 percent. Is that a factor of -- I mean,
15 before it was 33, and then by over-sighting, right, it
16 started at 38, and then by oversizing we got it down
17 to 33.

18 Industry had some -- I made some calls to
19 friends, and they determined that it was actually more
20 representative at 29, and now it's 24. So I just
21 wanted to get an understanding of that number.

22 MR. LORD: Dick Lord. It's what you learned
23 -- it's what came out of the weighted analysis.
24 Fifteen percent over-sizing, over-rationalization
25 trying to get closer to real buildings. It's just the

1 latest analysis weighting it out at that value.

2 MS. MAUER: This is Joanna. I guess I'm
3 confused because I thought the 29 percent was from
4 you're talking like Jill's survey of --

5 MR. LORD: You have to go back and look at
6 the 29 percent. I mean, it's been that number for a
7 while, at least in my study.

8 MR. ALATORRE: I thought we had a
9 temperature check -- you know, we had a temperature
10 check to agree to the 29, and that was based off of
11 discussions, I guess, with Walmart, and the survey
12 from Jill. We had got away from what was the
13 spreadsheet was saying.

14 MR. LORD: I mean, the Walmart data is more
15 around 14 percent. This is a weighted of all ten
16 buildings.

17 MS. MAUER: This is Joanna again. I guess,
18 can you just help us understand, maybe we're not
19 understanding. So Jill has this data that you got
20 from consulting engineers, or something. How is that
21 -- is that combined -- how does that relate to --

22 MS. HOOTMAN: So first of all, my data was
23 ranges, right? It didn't have the exact points. So
24 it was just ranges saying for those particular
25 buildings. It just supported what his averages came

1 up with.

2 MS. MAUER: But I thought the reason you
3 guys were doing that survey data was because there
4 were concerns of the --

5 MS. HOOTMAN: It was a concern that the way
6 the load analysis was coming up with, it was too high
7 for those types of buildings. And so it was
8 validating that going to a lower amount in those types
9 of buildings was more customary in practice.

10 MR. ALATORRE: And, I believe, we agreed in
11 the temperature check method to settle at 29 though.

12 MR. FALTERMEIER: So I think on our end when
13 we looked at what is the version 15 files, I think the
14 analysis weighted average was like 28 percent, and
15 then the version 16 and 17 files, it's now lower, it's
16 more like 24 percent. We have not been able to fully
17 understand yet why that is happening.

18 But we had noticed that there may be some
19 changes in the assumed cfm/ton. So I'm just wondering
20 if industry has been changing that value, because that
21 might affect the --

22 MS. MAUER: This is Joanna. If I can ask a
23 different question about number 6. And, I guess this
24 is the question that I raised last week that I'm just
25 not sure I understand what it means to say that

1 representations of air flow must be made at full load
2 at a minimum air flow of what we mean by that; where
3 are those representations being made.

4 MS. ARMSTRONG: So I think the point of this
5 is that if you're making air flow representations,
6 that they must be made in accordance with those that
7 are used for the test procedure; so in other words,
8 it's whether that ends up being a certification.

9 We already talked about -- whatever the
10 representation is, whether that is in literature, or
11 whatever it is, it has to be consistent.

12 In other words, you're not using something
13 different from testing than you otherwise are
14 representing to the broader -- it's the same thing we
15 typically do. It's just written in a way that's
16 surrounding representations, because this is a test
17 procedure, and that's kind of how we move things
18 forward.

19 MR. FALTERMEIER: So actually on this
20 specific issue of unit air flow, this was actually a
21 point that the advocates had raised, that they didn't
22 want it to be just like if you make representations.
23 They want to have that data for every unit.

24 MS. ARMSTRONG: And I don't understand the
25 ask. I don't understand the ask and how that

1 intersects.

2 MS. MAUER: This is Joanna. And I think
3 actually what we decided was that the manufacturers
4 were kind of committing to publishing that information
5 in the AHRI directory. So I don't know what that
6 means in terms of the term sheet.

7 MS. ARMSTRONG: It doesn't, right? This is
8 the DOE term sheet. This is the DOE. You're making
9 an agreement with the Department. The Department
10 moving it forward combined representations. That in
11 and of itself finds what they would say to AHRI, if it
12 goes in there. In other words, how they would do it.

13 Now, where it ultimately goes in AHRI, or in
14 DOE'S certification database, or anywhere else, this
15 is the procedure they would have to follow.

16 So you can add a provision in there, that
17 they have to put it in the AHRI database, but that's
18 not something DOE can implement through -- in fact,
19 this is what DOE can implement from a rule -- I think
20 an important DOE world.

21 MS. MAUER: That's fair. I guess I would
22 suggest -- I mean, maybe it doesn't matter, but, I
23 think, then what we're saying here is the
24 representations must be made in accordance with the
25 test procedure, not the manufacturers must --

1 I guess I'm not sure that there's regulatory
2 language that would say the manufacturers must make
3 representations, but rather, if they're making
4 representations, they have to be in accordance with
5 test procedure.

6 MS. ARMSTRONG: So the language you're
7 suggesting is to make representations voluntary, and
8 that's not what you just said that you wanted.

9 MS. MAUER: I realize that, but, I guess --
10 I mean, can you implement -- I mean, ultimately what
11 matters is -- well, I don't think that -- okay.

12 MS. PETRILLO: Laura Petrillo, AHRI. The
13 way we handled this in the past rulemakings where
14 representations of EER for example, were not going to
15 be the Federal metric anymore. AHRI had submitted to
16 the docket of what the commitment was on our side to
17 support the agreements made here. So we would follow
18 suit if there are agreements made for a publication of
19 a particular metric or feature of a particular air
20 flow that we could submit that same commitment to the
21 docket as well.

22 MS. MAUER: Thanks, Laura. That's helpful.

23 MR. LORD: Dick Lord. I did a quick check,
24 and when we looked back at 30/15, we had a couple of
25 weights on the buildings backwards. Scott pointed

1 that out, and we said we corrected those and that
2 changed the weighting a little bit from the 28 to the
3 24 percent. But I can show you that. I think it was
4 sit down restaurant and a couple other buildings where
5 we had the numbers backwards.

6 MR. TEAKELL: Kevin Teakell. I've got one
7 question. You added any representations made must be
8 in accordance. Does that mean I can't tell customers
9 specific cfm's for their jobs when it says any
10 representation. That was just added a second ago.

11 MS. ARMSTRONG: How about I tweak the
12 language that was in the first sentence. I think it's
13 the specific representations that we include that may
14 have been in accordance with test procedures.

15 MR. TEAKELL: Yeah. And I agree with that.

16 MS. ARMSTRONG: If you were to make other
17 representations of air flow outside, I don't know
18 that --

19 MR. TEAKELL: We do that all the time.

20 MS. ARMSTRONG: But you can't make -- right.
21 Yeah. Your tables, et cetera. But, I think, the
22 issue here is if you do make full load ones, et
23 cetera, the ones that coincide should be there.

24 MR. ROBERTS: So with that clarification in
25 mind, are people okay to take a consensus check on it,

1 I guess, as it currently reads?

2 MR. ALATORRE: Yeah. This is Mark with
3 PG&E. I think we need to discuss having some type of
4 a floor on the minimum air flow that would need to be
5 representative as a function of capacity for it to be
6 actually something that could be usable, or
7 enforceable.

8 You know, looking at the analysis, I think
9 version 17 had a cfm/ton of 397, or 96, something like
10 that. So is this supposed to be 24 percent of that as
11 minimum air flow?

12 I think that's something that we need to
13 nail down so that it's clear in the test procedure
14 what air flow should be running in the D-bin.

15 MR. TEAKELL: Kevin Teakell. Yeah. My
16 interpretation is it's 24 percent of the full load
17 that you design for that particular unit, not what the
18 analysis said. But if I got some unit that has 350,
19 or whatever, it's 24 percent of that particular unit.

20 MR. FALTERMEIER: This is Sean. I think
21 Mark's point is that the analysis that was used to
22 develop these numbers is based on an assumed specific
23 cfm/ton.

24 And so like if it's -- if you decide in a
25 given unit to have a, say, significantly lower rated

1 air flow, your buildings don't have any lower absolute
2 ventilation requirements.

3 So the minimum air flow on a unit where a
4 lower rate cfm should theoretically be higher; is a
5 fraction of the full load air flow because -- and this
6 is just based on the fraction of air flow rather than,
7 say, if it was a function of full load capacity, that
8 would potentially be a way to account for that kind of
9 back and forth floor space then capacity would more
10 directly correlate to then the air flow.

11 I mean, I think, one thought Detlef had here
12 was you could express this instead of being 24 percent
13 of full load air flow, it could be 24 percent times
14 the cfm per ton in the average in the analysis, which
15 I think was just right around 400.

16 MR. WESTPHALEN: Times 8 test capacity
17 divided by 12,000.

18 MR. ALATORRE: This is Mark with PG&E. And
19 that would be the floor, right? Like that would mean
20 we can't go any lower than that because you only one -
21 - something higher than that, right?

22 MR. FALTERMEIER: So it would be the same
23 concept as the floor. The industry would suggest it's
24 just making a function of full load capacity instead
25 of full load air flow.

1 MR. ROBERTS: Do folks want time to think on
2 that?

3 MR. RILEY: Yeah. This is Pat. I think
4 we're going to need some time to think about that one.
5 That's new.

6 MR. ROBERTS: So, with that, we'll return
7 after a caucus break on 2, 4, and 6. We will take
8 consensus checks on those. So the recommendation
9 obviously is to clarify positions on that. But,
10 obviously, bring any language proposals, tweaks, that
11 you think will move people into consensus where there
12 might not be now. It sounds like 2, 4, and 6 we might
13 not be in consensus since we haven't taken a vote yet.

14 So that's obviously the recommendation. How
15 long do folks want for those considerations with the
16 goal of getting through this document today? At least
17 one. But the original break was until 1:30. We can
18 go to 2:00? Hour and a half? Okay.

19 (Background discussion.)

20 MR. ROBERTS: Okay. We'll reconvene here at
21 2:00.

22 (Whereupon, at 12:22 p.m., the meeting in
23 the above-entitled matter recessed, to reconvene at
24 2:05 p.m. this same day, Wednesday, December 14,
25 2022.)

1 //

2 A F T E R N O O N S E S S I O N

3 (2:05 p.m.)

4 MR. ROBERTS: All right. Welcome back,
5 everyone. I hope you enjoyed lunch.

6 Finishing up the initial review of the term
7 sheet on the cooling metric pieces, 2, 4, and 6. Is
8 it okay to take them from the top? That's a tough one
9 out there.

10 First and foremost, in terms of a report
11 out, do folks want to just speak on where respective
12 caucuses are on recommendation number 2 at this
13 moment?

14 MS. MAUER: This is Joanna from ASAP. I
15 think we wish we'd had more time to fully consider the
16 LBNL analysis, and a develop a systems level approach,
17 but given where we are, I think we can reluctantly
18 agree to the values that are on the screen.

19 MR. ROBERTS: Anything additional?

20 All right. Let's take a consensus check on
21 representation number 2. Again, thumbs up love it;
22 sideways you can live with it, or you're not
23 withholding consensus; thumbs down you have serious
24 reservations.

25 We still have quorum without Joe. But Joe

1 if you can hear this, please vote if you can.

2 (Background discussion.)

3 MR. ROBERTS: Okay. Moving onto
4 recommendation 4. Anyone care to give a report of
5 where their respective caucus is on their thinking
6 along recommendation number 4?

7 (Background discussion.)

8 MR. ROBERTS: These are initial tests from
9 analysts. If people want questions? Is it okay to
10 take a census check based on the initial analysis?

11 So we're okay to take a consensus check. If
12 people want to indicate where they are on
13 recommendation number 4. Okay. We have 11 up in the
14 room.

15 MR. THARP: Rusty from Daikin. What was the
16 count on the last recommendation number 2?

17 MR. ROBERTS: I believe it was six up, five
18 to the side.

19 MR. THARP: I thought we had seven
20 manufacturers.

21 MS. WILLIAMS: So on the term sheet, I'm
22 only reporting no vote per previous precedent. So I
23 don't know.

24 MR. ROBERTS: Critically, I didn't see any
25 thumbs down. I saw some reluctant support. But, I

1 guess this one phrased better. No thumbs down. We
2 are in consensus.

3 And then finally, recommendation number 6.
4 Any report out, comments, consideration on
5 recommendation number 6?

6 MR. RILEY: So I'm sort of confused on what
7 we're taking the temperature check on. The discussion
8 before lunch was more around what that 24 percent was.

9 MR. ROBERTS: Do you want to speak to that
10 comment, Sean?

11 MR. FALTERMEIER: Yeah. So I think what
12 we've written in this comment here, right, as everyone
13 was heading out for lunch was that advocates were
14 suggesting that this warranted the minimum air flow to
15 reflect variation in rated air flow between models.

16 And so the suggestion here is to have the
17 minimum part load air flow instead of being a function
18 of full load air flow, have it be a function of full
19 load capacity, which would better correlate with floor
20 space occupancy, and absolute ventilation cfm, and
21 then air flow.

22 So the comment on the bottom right has a
23 suggested formula of 24 percent times full load
24 capacity times 400 cfm/ton at the time, which was
25 almost exactly, I think, the average value in the

1 latest industry analysis. I think it's 397, or
2 something, and then per units divided by 12,000.

3 MR. THARP: Rusty Tharp, Daikin. Can I
4 suggest going ahead and updating the term sheet with
5 that formula?

6 MR. ROBERTS: With that modification, any
7 final comments, or questions, on recommendation 6?

8 Okay. Do folks want to do a consensus check
9 on recommendation 6? I see 11 thumbs up.

10 All right. I think we are through the
11 cooling metric. Congrats.

12 We are on recommendation 7. Questions,
13 comments on the IVHE formula?

14 (Pause.)

15 We're going to do Appendix C later on, but
16 for now are we okay to take a consensus vote on
17 recommendation 7?

18 Are folks okay indicating consensus approval
19 on recommendation 7? I see 11 thumbs up. Great.

20 Recommendation number 8 on the weighting
21 factors.

22 MR. RILEY: This is Pat. I just want to
23 just ask Dick a quick question.

24 Will we run into the same problem double
25 counting crankcase heat hours in the heating formula?

1 MR. LORD: Yes.

2 MR. ROBERTS: Did Dick answer your question?
3 I didn't hear the response?

4 MR. RILEY: He did answer the question, and
5 it's still an issue in the heating formula as well. I
6 don't know if we just take note of it here, or if we
7 need to solve it before voting.

8 MS. WILLIAMS: Are we talking about
9 crankcase heat hours?

10 MR. LORD: Yes.

11 MS. WILLIAMS: Can I just put a comment on
12 it?

13 MR. ROBERTS: With that note in mind, any
14 other comments, or questions?

15 MS. MAUER: This is Joanna. I think we have
16 some significant concern with hours in that low load
17 bin.

18 MR. RILEY: Sorry. I guess I'm trying to
19 figure out what temperature check we're taking here,
20 and where we stand.

21 MR. ROBERTS: What I was looking at was a
22 consensus check on recommendation 8 with that note in
23 that final hour cell on crankcase heat, but Joanna, do
24 you just want to expand a bit more on where some of
25 your concerns lie?

1 MS. MAUER: I think -- well, maybe we have
2 consensus that we would like to use LBNL's analysis
3 for heating hours.

4 MR. TEAKELL: Kevin Teakell with AAON.
5 Industry kind of agrees with that, temperatures and
6 hours.

7 MS. MAUER: And Dave was just clarifying
8 that maybe I should have said temperatures, and hours.

9 MR. RILEY: But, I think, the same note
10 still holds true about crankcase heat. So just to
11 make sure that ventilation and crankcase heat are
12 separate.

13 MS. WILLIAMS: So I don't have the
14 ventilation crankcase heat hours off hand, so we'll
15 provide them. Sorry.

16 MR. RILEY: Was there a number of
17 ventilation only hours for heating?

18 (Background discussion.)

19 MR. YOUNG: Yeah. This is Scott from LBNL.
20 And yes, we do have those numbers. I think that we
21 didn't have them on the slides here, but, I think,
22 they are pretty similar to what was in this file. And
23 so we can just get those numbers for you.

24 MR. ROBERTS: So with those notes and
25 corrections in mind, are we still okay to -- does that

1 answer your concern, Joanna?

2 Okay. Are we still okay? Can we get a
3 consensus check on 9? I see eleven up in the room.
4 We're good. Now we can go to 9.

5 Sorry, Joe. Yeah. We're voting on
6 recommendation number 8, with the corrections in those
7 red most two columns with the note on double-checking,
8 making sure we're not double-counting crankcase
9 heating hours.

10 Questions, or comments on recommendation 9?

11 MR. ALATORRE: This is Mark with PG&E. What
12 is a sampling plan?

13 MS. ARMSTRONG: I think I wrote the same
14 language. Now, whether or not -- the way DOE'S regs
15 work, currently you have to test more than one unit,
16 and come up with like your representation based on
17 testing multiple units, and apply our stats.

18 Or you can -- certain conditions on that.
19 Use a simulation comment a diem for generator ratings,
20 right?

21 So the point here would be that we're coming
22 up with new metrics. We're trying to put a new test
23 procedure, but all those existing structure
24 surrounding the sampling plans, or representations,
25 the tolerances. A diem provisions would all

1 translate. It's a very general language. I'll say
2 that.

3 MR. ROBERTS: Any other questions?

4 MR. RILEY: This is Pat. So we discussed
5 this for quite some time, and we're still stuck on
6 normal maximum, and normal minimum definitions in the
7 notes section of that chart.

8 And I know we've also talked about kind of
9 pawning this off to ECS to figure out what should be
10 the appropriate required, or optional test forward,
11 high efficiency heat pumps.

12 But at the very least, probably within this
13 term sheet, we'd like to define what those speeds are
14 for -- we'll call it the H47 full, the H17 full test,
15 as well as H47 and H17 low tests, and we want to make
16 sure that the speeds for each of the full and the low
17 set of test points are the same for each one of those
18 temperatures.

19 MR. WESTPHALEN: So when you say you want to
20 define what a normal maximum for the given ambient
21 temperature means?

22 Do you have any suggestions for that, or are
23 you asking us for some --

24 I think it gets a little complicated on
25 variable speed equipment, and that's why I'm saying

1 perhaps in the ECS we can tackle that, but for
2 minimally compliant equipment, as they are today, I
3 think it would be fairly clear what full speed, or low
4 speed, is in that minimally compliant equipment.

5 So with that, I assume by minimally
6 compliant, you mean something that likely would not
7 have a variable speed compressor, so you're talking
8 about stage levels.

9 MR. RILEY: Correct.

10 MR. WESTPHALEN: So it's very clear like
11 you've got compressors A, B, and C. You have to have
12 A, B, and C on for the full tests for 17 and 47.

13 MR. RILEY: Yes.

14 MR. WESTPHALEN: That's exactly what -- I
15 mean, I guess that's not part of this asterisk here
16 because this is about variable speed, but the
17 intention is that the high would represent the same
18 numbers, same -- all the compressors operating at
19 their high stage for 17 or 47.

20 Likewise, anything you use to interpolate,
21 and this gets further down into the appendix, anything
22 that you use to interpolate would require the same
23 stage levels if you were going to go beyond the 17
24 down to 13 in doing your interpolation.

25 And the expectation is that if you're

1 interpolating above 17, you would never mix stages
2 anyway.

3 MS. MAUER: This is Joanna. I just have a
4 clarifying question on this table. For the H4B test,
5 I think it originally was listed as optional only for
6 variable speed equipment. And I think Mark raised a
7 question of why should we limit it to that. And so
8 we've added the optional for single, and two-stage as
9 well.

10 Did we decide that it's still okay to call
11 that a boost speed?

12 MR. WESTPHALEN: I think you get into all
13 these footnotes about the variable speed when you
14 start talking about the boost because boost
15 potentially means at 5 you have a higher speed than
16 you would as your highest speed at 17. And then you
17 quickly get into the weeds on the discussion of the
18 variable speed, and what you do, and what the system
19 does, and whether you use vapor injection.

20 MR. TEAKELL: Kevin Teakell. Boost doesn't
21 necessarily mean speed. It could be a different
22 technology. It could be vapor injection, or something
23 else too, but it's not necessarily speed related.

24 MR. WESTPHALEN: Right. Understood.

25 MR. TEAKELL: Yeah.

1 MS. MAUER: I guess I'm just trying to
2 understand like for a single stage, it's not going to
3 be a different speed right then in your 17 for your
4 test. Is that accurate?

5 MR. WINNINGHAM: Yeah. I think what Joanna
6 is bringing up is kind of if we're looking at 47 and
7 17 full, and you choose for this optional test to run
8 the 5-degree-test with those same settings, or number
9 of compressors, that's allowed, and that's a different
10 kind of point than this boost operation. I think
11 that's what she's trying to clarify.

12 MR. WESTPHALEN: Yeah. Understood. I think
13 -- well, I can figure out what makes sense, align all
14 the terminology when we write in the NOPR. But
15 certainly you could do a -- put, say, an H4B, or H4I,
16 or H.

17 MR. WINNINGHAM: Yeah, H4H, and H4B. That B
18 could be many different things.

19 MR. WESTPHALEN: Yeah. Understood.

20 MR. RILEY: Is there any way the term sheet
21 can reflect more straightforward definitions for the
22 test names? This might carry over from 210/240
23 negotiations. Those are confusing at best.

24 MR. WINNINGHAM: I think what Pat is saying
25 is let's come up with an abbreviation that kind of

1 represents what the condition is in the mode.

2 MR. RILEY: Correct. I'd love to see it
3 called H47, H17, H5, and then the subscript.

4 MR. ALATORRE: Too simple.

5 MR. WESTPHALEN: Yeah. We could do that.

6 MR. FALTERMEIER: Dave, were you suggesting
7 that H4, I guess we're calling it H5 now, H5 and H5H
8 might be two lines?

9 MR. WESTPHALEN: Yes. And I think it could
10 just say H5B, or H5H.

11 (Background discussion.)

12 MR. ROBERTS: Thank you, Alison. Anything
13 else on recommendation -- what number are we on?

14 Okay. Let's take a consensus check on
15 recommendation number 9.

16 MR. RILEY: With those modifications. I'm
17 sorry. Looking down in the notes, it looks like
18 number 3 hasn't been updated. It would have to be
19 updated based on the decision from above.

20 MR. TEAKELL: Kevin Teakell, AAON. You've
21 still got in that note 2 and 3 you say it's normal
22 from the maximum and normal min.

23 MR. RILEY: Read note 4.

24 MR. TEAKELL: Okay. So we're going to
25 define that some more. Okay.

1 MR. RILEY: Yeah.

2 MR. TEAKELL: All right.

3 MR. WESTPHALEN: Is it clear here that to
4 keep a full load is a test capacity, since we have
5 that? Shall we just call that --

6 MR. RILEY: Well, you have the QFL.

7 MR. TEAKELL: Q95.

8 MR. WESTPHALEN: Or say Q., A, test.

9 MR. ROBERTS: Anything else on
10 recommendation 9?

11 MR. TEAKELL: Kevin Teakell, AAON. So down
12 in that last kind of paragraph, it says, "the
13 manufacturers make representations at these
14 temperatures". Does that language exclude us from
15 making representations at other temperatures, COP and
16 capacity?

17 MS. ARMSTRONG: Yes. Typically that's the
18 way it works.

19 MR. THARP: Does that preclude us from making
20 other representations?

21 MS. ARMSTRONG: I'll answer it with a non-
22 answer, and turn around the question. What other
23 representations are you having?

24 MR. THARP: Rusty Tharp, Daikin. I'll say
25 that most manufacturers will have what we sometimes

1 refer to as expanded ratings, or detailed ratings,
2 that give operation parameters.

3 MS. ARMSTRONG: You're doing that now?

4 MR. THARP: I'm sorry?

5 MS. ARMSTRONG: You're doing this already?

6 MR. THARP: It is information customers look
7 for. The manufacturers have been provided for
8 decades. And I think that's what you're referring to,
9 Kevin, right?

10 MR. TEAKELL: Yeah. That's what I was
11 referring to.

12 MR. WESTPHALEN: Is this intended to say if
13 you make representations at these temperatures, it has
14 to be in accordance with the DOE test procedure?

15 MS. ARMSTRONG: I understand what you're
16 trying to accomplish.

17 MR. THARP: I withdraw my comment.

18 MS. ARMSTRONG: I understand what you want.
19 Let's put it that way.

20 MR. ROBERTS: All right. Let's take a
21 temperature check on number 9, or a consensus check.

22 All right. Eleven up. And then, thank you,
23 Joe. Twelve up.

24 All right. Recommendation 10.

25 MR. RILEY: I'm sorry, can we possibly go

1 back one recommendation?

2 MR. ROBERTS: Are you talking about 8?

3 MR. RILEY: To 8. Yes. Was the building
4 load line, actually charted out for these temperatures
5 and loads because Dick did chart it out as a slight
6 bump in the building load line. I'm just wondering if
7 that is intentional or not.

8 MR. YOUNG: Yeah. This is Scott from LBNL.
9 Yeah. We had it charted out for each of those low
10 load bins, low points in the load bins. Is that what
11 you're asking about?

12 MR. LORD: Scott, it looks like around 75,
13 80 percent. The change in temperature is very
14 gradual, and then there's a rapid change. It seemed
15 kind of discontinuous.

16 MR. YOUNG: Yes. Yeah. Yeah. It looks
17 like 75 is a little higher than you might expect, and
18 85 might be a little lower than what you might expect.

19 MR. LORD: Yes.

20 MR. YOUNG: I don't know exactly what that
21 is. We can look at it, and if we think that it's
22 valuable to have it to be a more smooth one, we could
23 figure out if that's possible.

24 MR. LORD: That only makes a lot of
25 difference because of these figures.

1 MR. YOUNG: Yeah. Yeah. Exactly. We can
2 certainly look at that.

3 I should also maybe mention too is we talked
4 about the ventilation hours. And I think, in Dick's
5 analysis is 73 the one that you had most recently did,
6 73? I took a look back, and we had, I think, about
7 500.

8 But, I think, some of that you had to devote
9 a whole bunch of hours in your really low load bin
10 that we don't actually have. So you had like 2,000
11 extra hours there that we don't have. So likely
12 there's going to be some portion of that that might
13 become sort of fan only.

14 And so I think what we have to do is -- you
15 know, since we're going to be using Dick's analysis
16 for the cooling part, and then this stuff for the
17 heating part, we need to just look and see where
18 things overlap, and figure out what the best way is
19 for those numbers to jive together.

20 MR. LORD: One you should check too is
21 because there's simultaneous heating and cooling, you
22 may be counting fan hour twice, you know, in the
23 cooling and in the heating. And so I was kind of
24 careful on that. So just take a look at it.

25 MR. YOUNG: Yeah. Exactly. We figure we're

1 not just going -- just make sure all those things are
2 counted, and counted together.

3 MR. LORD: Which I have over 80 hours a
4 year.

5 MR. YOUNG: Exactly. Right. Okay.
6 Perfect. Thanks.

7 MR. ROBERTS: Okay. So I think that brings
8 us back to 10, cut-in/cut-out. Questions, comments?

9 MR. RILEY: The only thing that we discussed
10 as to this one, we would think that verification would
11 be required if the 5-degree-test wasn't conducted.

12 MS. ARMSTRONG: I don't understand.

13 MR. RILEY: If the 5-degree-test is
14 conducted, you're essentially figuring out if there's
15 impact to a cut-in/cut-out temperature just by running
16 the test.

17 MS. ARMSTRONG: I'm not following.

18 MR. TEAKELL: Kevin Teakell, AAON. So to
19 add to that, so we have our 17 tests, and then there's
20 a couple of bins below that. So if you don't do the
21 cut-in/cut-out test, you don't know for sure that the
22 unit will run at those two lower bins. You know it
23 runs at 17, right?

24 So if you run the 5-degree-test, you know
25 that it will run for all of those. So there's no

1 reason to do the cut-in/cut-out.

2 MR. WESTPHALEN: Yeah. I mean, I understand
3 exactly what you're saying. What I was going to
4 respond had to deal the enforcement policy part of it.

5 You know, DOE doesn't have to run this test.
6 They may or may not, but they have the option to.

7 MS. ARMSTRONG: So essentially what he's
8 done is write a test for me. So it's not for you, but
9 it's for me. And it says this is how I will determine
10 if the cut-in/cut-out, et cetera, is appropriate.

11 And so he's basically spelled out that if I
12 ever get into an enforcement situation, and I am
13 testing your products, and you certify certain
14 cut-in/cut-out temperatures, this is the procedure I
15 will use to say they're valid.

16 So whether or not you use it for
17 certification, I think, this just says it's
18 enforcement. So this would be on the Department. You
19 could opt to use it, but the way it's written right
20 here, you wouldn't have to. Does that help? But it
21 does give you a sense of how we would do it.

22 MR. RILEY: So, again, we're not -- so if
23 you do run the test, you're validating what to use in
24 a calculation.

25 MR. WESTPHALEN: Correct.

1 MR. RILEY: Okay.

2 (Background discussion.)

3 MR. ROBERTS: Any other questions, or
4 comments on 10?

5 All right. Let's take a consensus check on
6 recommendation number 10. That's 12 up.

7 All right. Recommendation 11 on furnace for
8 energy use.

9 MR. WINNINGHAM: Hi. This is Dave with
10 Lennox. I'll hold my thought.

11 We've had a lot of discussion around this,
12 and it's still our contention that we're accounting
13 for this in the wrong mode.

14 I think all of us have agreed that we want
15 to move forward with an approach of total capacity
16 divided by total power for a given mode of operation.

17 And we're kind of freeing this into the side. And we
18 just still feel it's inappropriate.

19 MR. RILEY: To add onto that. If you look
20 at kind of the whole package of what we put together
21 here, and how our overall responsibility to come to
22 the table and negotiate in good faith, we've really
23 felt that we're fulfilling that responsibility by
24 framing IVEC metric that includes a lot more impact
25 for inefficiency, and fan energy, by introducing

1 ventilation mode, and economizer only mode into the
2 metric.

3 So, I mean, overall, we feel that the
4 decisions based on fan technology to be used. And our
5 equipment is really going to be determined by the IVEC
6 metric, and it would not be by an additional metric
7 from the fan in furnace mode.

8 MS. MAUER: This is Joanna with Rheem. I
9 think the challenge that we see is we think it's very
10 possible that we'll end up with an IVEC standard that
11 does sufficiently encourage fan efficiency.

12 I think the challenge we see is we, of
13 course, can't know that until we have that discussion,
14 right. So I think our concern is if we don't agree on
15 a metric here, then we don't even have the option of
16 considering a standard. If we can get to an IVEC
17 standard where we all think it's not necessary to have
18 a separate standard for furnace energy fan, I think
19 that's great.

20 So I don't -- I mean, I understand it's kind
21 of a complicated question. It's just, I think, yeah,
22 if we don't have it here, then we're taking off the
23 table even the option without knowing in advance
24 whether we are, in fact, going to get to an IVEC
25 standard that does accomplish what it is we're trying

1 to accomplish.

2 MS. SKIDD: This is Allison with Rheem. I
3 appreciate that, Joanna. I think we were discussing
4 that same thing. We have to kind of go on faith on
5 what we're feeling by intuition on IVEC as going to be
6 demonstrated when we get to ECS, and there isn't a
7 guarantee, and there's no way -- we're not going to
8 leave here with that guarantee, right? So we have to
9 decide whether we can move forward with that or not.

10 And so, I guess another thing we were
11 thinking of is whether having it, or having the back-
12 up in here saying a separate metric, if in the end
13 that would end up driving market -- driving the
14 market, or driving customer selection anyway. And it
15 was hard for us to get there, that this was going to
16 affect customer behaviors having this metric in there.

17 MS. MAUER: This is Joanna. I don't think I
18 disagree with that. I think what we're trying to
19 drive is more equipment design than necessarily I
20 agree. I don't see this as like how the customer is
21 going to say I want this piece of equipment because of
22 how the higher kilowatt hour per cfm.

23 I don't know. Does anyone have a position
24 on this? And they can interrupt me if I say something
25 that I shouldn't be saying.

1 But like I'm personally okay with -- if we
2 can keep this in for now, I'm fine with revisiting it
3 in the standards discussion depending on where we
4 land. But again, like if we don't consider it now, I
5 don't know. That seems to take it off the table later
6 on.

7 MS. HOOTMAN: This is Jill from Trane. I
8 think when it comes to equipment design, there's
9 already a lot of levers that we're pushing. Like we
10 said, we think that the end design will be incentivized
11 here on the cooling side with what we're doing with
12 IVEC.

13 We're substantially changing equipment
14 design around heat pumps with IVHE. Adding more
15 certification representations. Even if it's not used
16 now, it's there. It can be used at some time.

17 So I think we just have a general problem
18 with being able -- putting that in now.

19 MS. ARMSTRONG: I guess it's my turn. We
20 are at the point of we think this will work itself out
21 in the standards. We are willing to discuss it at the
22 standards. But there has to be a commitment that it
23 has to be addressed. And it can't just come off the
24 table all together.

25 And so from the Department's perspective,

1 from history, from what's in dockets, I have a
2 responsibility to address this in some way, shape, and
3 form. And I can't tell yet where I am going to
4 address it until we get done with this whole process,
5 right?

6 And so I think what is necessary here,
7 right, is a commitment that this will be addressed as
8 part of the standard, and it could be addressed with
9 the stringency of IVEC. We all hope that's the way it
10 ends up, but if it's not, then we need to do something
11 else.

12 And I think that the reality is that's where
13 we are, and if you want to take it out of here all
14 together, that's fine, but the Department needs to
15 address it somewhere, and that we've been on the table
16 for other products as well. I don't think that's an
17 ideal outcome.

18 MR. WINNINGHAM: This is Dave with Lennox.
19 So to that point Ashley, would an alternate proposal
20 that indicates directly that we were going to have
21 this discussion as part of the ECS rather than adding
22 an additional metric at this point in time to satisfy
23 that, and I'm just offering the question.

24 MS. ARMSTRONG: I think the problem we have
25 here is twofold. One is it's possible. I'm open to

1 that, to be frank. I don't know if the other
2 advocates in the room are.

3 But if it's not addressed as part of IVEC,
4 and the stringency of IVEC itself, and people aren't
5 comfortable, it is a separate metric, or it is
6 something else because --

7 And so we're dealing with a test procedure
8 here. That means essentially you could get to a point
9 where if we don't all think IVEC is a plan where it
10 could land before we address this, you're adding a
11 test procedure provision to the standard.

12 And so in an ideal world, I would really
13 prefer that it be here, and wrapped up. If I have to
14 meet middle ground, we need eyes wide open, and it
15 will be that we look at it through this -- you know,
16 the commitment is to be that we look at it through the
17 stringency of the IVEC lens with this as a fallback.

18 Does anybody want to talk?

19 MR. THARP: Rusty Tharp, Daikin. I guess
20 the next question I would pose would go back to --
21 others would be could we put a statement in the
22 recommendation here that says, given this could be
23 reversed depending upon conversation at ECS, or some
24 similar wording. Actually put that in this
25 recommendation.

1 MS. ARMSTRONG: Like as in this is the
2 recommendation moving forward. Well, a statement
3 about ideally will be based on the stringency of the
4 IVEC. We expect those negotiations to take place --
5 to be finalized on X date, or whatever it is, and that
6 DOE -- that term sheet may dictate whether this is
7 finalized as presented in that. Is that what you're
8 saying?

9 MR. THARP: Rusty Tharp, Daikin. Yes.
10 Something along those lines.

11 MS. ARMSTRONG: Yes. I can live with that.
12 Do we want to try to type it up?

13 MR. THARP: Are we taking one more break
14 this afternoon, or something; is that right? Run
15 through these, and do the rest -- is that okay?

16 MR. ROBERTS: Get through 14. We'll pause
17 on the final review, and the appendices review. Can
18 you make it a quick one?

19 MS. ARMSTRONG: I've got to talk to OIRA at
20 4:00.

21 MR. ROBERTS: We've got an hour. So it's
22 putting a pause on 11 for now. We're all into cross-
23 cutting in recommendation 12.

24 MR. FALTERMEIER: So this is Sean. We had
25 one suggesting clarification on the return supply

1 static split, which is suggesting that the tolerance
2 on 25 percent only applies to the full load test. The
3 assumption would be that because you're using a
4 damper, to restrict, and provide resistance, that the
5 part load statics would have comparable restriction,
6 that you wouldn't actually need to apply the talons at
7 each reduced static point.

8 MR. ALATORRE: This is Mark with PG&E. So
9 the assumption is that it would be like a linear
10 relationship?

11 MR. FALTERMEIER: Not linear, but the same
12 relationship with the school year like how we did air
13 flow for the rest of them with pressure drop.

14 MR. TEAKELL: Kevin Teakell. So you're
15 saying basically the system is not going to change, so
16 we don't have to change anything.

17 MR. ROBERTS: Anything else on 12? So we're
18 putting a pause on 12 recommendation.

19 Okay. Recommendation 13. Any questions, or
20 comments, on 13?

21 MR. ALATORRE: One more thing to discussion
22 number recommendation 12. If we can go back up. This
23 is Mark with PG&E.

24 It says there that the manufacturers will
25 certify the part load air flows, and just a

1 clarification that was kind of discussed earlier,
2 where is that going to be certified to?

3 MS. ARMSTRONG: The Department.

4 MR. ALATORRE: Okay. Thank you.

5 MR. ROBERTS: Okay to jump to 13?

6 MR. ALATORRE: Yeah.

7 MR. RILEY: Sorry. Clarification on
8 recommendation number 12. Certified part load air
9 flow rates is just the dew point.

10 (Background discussion.)

11 MR. ROBERTS: Go ahead, Sean.

12 MR. FALTERMEIER: Pat, this was referring --
13 not referring to the issue that the advocates wanted
14 of part load certification, but this is referring to
15 the existing practice of manufacturers reporting part
16 load air flows into S.T.I. to DOE for testing.

17 MR. TEAKELL: Kevin Teakell with AAON.
18 Should it say S.T.I. on there?

19 MS. ARMSTRONG: Let's go ahead and address
20 the issue on the table. Maybe I'm the only one -- but
21 just to be clear, the question for the certification
22 of the part load air flow is whether they are public,
23 or whether they are private, to the Department.

24 So when Mark looked at me and asked, and I
25 said to the Department, I was silent on the public or

1 private part. And when Kevin -- others have spoken
2 up, they're saying S.T.Is, which would not be public.

3 So this group should agree on what they want.

4 If the Department feels like they should
5 come to the Department, public or private will be open
6 to discussion.

7 MR. ALATORRE: Mark with PG&E. I think
8 we're only asking for the D-bin to be public. Full
9 load as well.

10 MS. ARMSTRONG: And then the rest goes in
11 the S.T.I. Perfect.

12 MR. ALATORRE: Yes.

13 MR. THARP: Rusty Tharp, Daikin. Where
14 we're saying public, to the AHRI directory? Is that
15 how we would handle that?

16 MS. ARMSTRONG: No. In the DOE database.
17 Whether AHRI makes them public, that's fine.

18 MR. THARP: So you would publish it in CCMS?

19 MS. ARMSTRONG: That's correct.

20 MR. THARP: Thank you.

21 MR. ROBERTS: Now I think we're on 13. Any
22 questions, or comments on 13?

23 MS. MAUER: This is Joanna. I guess a
24 clarifying question regarding the statement of the
25 certified wattage must be within 10 percent of the

1 maximum wattage? I guess I just want to make sure I
2 understand maybe how -- what DOE would do in an
3 enforcement situation.

4 Would DOE potentially measure the wattage,
5 and is it different than the certified value used to
6 measure wattage?

7 MS. ARMSTRONG: So I think that's the intent
8 we would measure. We just didn't prep the details of
9 that in the term sheet itself, but the expectation is
10 the measurement is within the rated, and the only way
11 to do that is measure it, and then you'd have to
12 figure out -- you'd use measure values going forward
13 if there was something off of the expectation.

14 MR. RILEY: This is Pat with Carrier. How
15 would it be handled for a dual-rated unit as far as
16 like 208 and 230 volt?

17 MR. WINNINGHAM: This is Dave with Lennox.
18 Just a clarifying question. What do you mean by
19 maximum wattage for the heater? Is that if we tell
20 you it's the maximum wattage?

21 MS. ARMSTRONG: Hopefully we're saying what
22 it is. I mean, just saying.

23 MR. WESTPHALEN: Well, if tested in
24 accordance with the test procedure, then you're
25 applying the power analyzer to the --

1 MR. WINNINGHAM: Okay. So it's a measured
2 value, or a known value, that the manufacturer would
3 certify. It isn't necessarily a crankcase heater's
4 manufacturer marking.

5 MS. ARMSTRONG: Is your maximum wattage the
6 you put on there for the marking, or for safety
7 standards, really different?

8 MR. WINNINGHAM: The voltage can be
9 different. For instance, I'm not saying this is
10 absolute for crankcase heaters, but typically electric
11 resistance space heaters are rated at a specific
12 voltage for equipment that we would mark for 208, or
13 230, might have a maximum -- be rated at 240 volts,
14 where in the equipment when we test it, we would test
15 it at 230, or 208.

16 And they are not insignificant as to the
17 difference between those for a resistance heater
18 between 240 and 230. There's probably about not quite
19 a 4 percent difference in the wattage value. If you
20 take that down to 208, that's about a 10 percent
21 difference in the wattage.

22 So it's kind of maybe getting into the
23 weeds, but just trying to understand what is intended
24 by the language of maximum.

25 MR. WESTPHALEN: Yeah. I would see that as

1 consistent with testing according to the test
2 procedure, and I ask the question of, okay, what does
3 340/360 say about the voltages. So assume you test at
4 both.

5 MR. WINNINGHAM: Okay. That's all. Thank
6 you.

7 MR. RILEY: Yeah. I think the confusion
8 came from this statement on the certified value of the
9 crankcase heater, within 10 percent of that. As long
10 as we're doing it at the tested voltage, I think we're
11 fine.

12 (Background discussion.)

13 MS. ARMSTRONG: The idea here is just to
14 test at the nameplate, et cetera, good enough.

15 MR. THARP: Rusty Tharp, Daikin. So would
16 it be adequate for manufacturers to put in their STI
17 that this unit, this crankcase heat, is X watts at Y
18 volts, or A watts at B volts?

19 MS. ARMSTRONG: Yeah. You can do that.

20 MR. THARP: Okay. Then I think that
21 resolves any issues.

22 MR. ROBERTS: Any other questions on 13?

23 All right. Let's get a consensus check on
24 recommendation number 13. I see 11 up in the room.
25 Thank you, Joe. 12 up.

1 We'll close it out with 14, and then we'll
2 take a caucus. So implementation recommendation 14.
3 Any questions, or comments?

4 (Background discussion.)

5 MR. ROBERTS: Let's take a temperature
6 consensus check on recommendation 14 implementation.

7 Oh, wait. There is a question in the chat.

8 MS. ARMSTRONG: The DFR authority (phonetic)
9 is not for test procedures. So I don't think that
10 that is relevant here.

11 MR. ROBERTS: All right. I'm being told Joe
12 is good. Let's take a consensus check on
13 recommendation 14. 11 up in the room. Thank you,
14 Joe.

15 All right. So we're not going to take a
16 look at appendices quite yet, and not obviously going
17 to review the whole document. We'll come back on 11
18 and 12.

19 How much time do folks think they want? 15,
20 20? 20?

21 (Background discussion.)

22 MR. ROBERTS: All right. Folks, is it okay
23 to pick things up at 3:35? Okay. See you then.

24 (A break was taken from 3:15 to 3:40 p.m.)

25 MR. ROBERTS: All right. Welcome back,

1 everyone. Do we want to pick right up sequentially
2 with where we left off. Does the industry want to
3 report out their current thinking on recommendation 11
4 on furnace energy?

5 I'm sorry. Picking up with recommendation
6 11. I think we have a quorum.

7 MR. TAUS: Yeah. This is Jason Taus with
8 Carrier. I will report the outcome of our caucus.

9 We talked about it, and, I mean, we've just
10 been designing these products for a long time. We're
11 convinced that including a new metric is not going to
12 drive design changes, or requirements. We
13 wholeheartedly believe that IVEC did that.

14 And secondarily, just doesn't make sense to
15 include furnace fan energy in a cooling metric. We
16 are wholeheartedly committed to do an ECS analysis
17 confirming that, but just including it at this point
18 doesn't make sense to us.

19 MR. ROBERTS: Any other thoughts, or
20 questions?

21 All right. Well, let's take a consensus
22 check on that nonetheless, we're -- no? We're not
23 going to do that? All right. I've been told we might
24 wait on that one.

25 In the meantime, is it okay to move to

1 number 12? Does anyone want to report out on their
2 thinking on 12?

3 MR. ALATORRE: Yeah. This is Mark with
4 PG&E. I guess our main issue was with adding the
5 language to really to just apply the tolerances at the
6 full load test point.

7 And after speaking with Guidehouse, and
8 understanding that it's a difficulty in maintaining
9 similar to the lower air flow is the issue behind
10 this. And I think we're okay.

11 Given that we can add some more language
12 here, we could. It still should be appropriate at
13 full load, and also at the B-test given that the
14 B-test is mostly full load as well.

15 And then if we can add language for the
16 other two conditions, you know, once you establish
17 your statics differential that basically the damper
18 position shall change for the other test conditions.

19 MR. FALTERMEIER: So just to clarify. When
20 you say -- did you say you thought it should apply to
21 the B-test as well because that's also at full load.

22 MR. ALATORRE: Well, full air flow most
23 likely. That's the amount of mechanical only hours,
24 and the small economizer integrated.

25 MR. FALTERMEIER: So the B-test is often

1 going to be an interpolation between a full load test,
2 they test essentially, test at the lower temperature,
3 and a lower stage test at that temperature, unless the
4 unit hit that lower stage. It's at 1.3 percent at a
5 lower stage.

6 Even interpolating the A or B-test results
7 with two tests at the B temperature at full load, and
8 a reduced load, then operating at that full load air
9 flow, I think, is already covered because it's the
10 same air flow as the full load cooling test.

11 MR. ALATORRE: All right. This is Mark with
12 PG&E. The main concern is basically as it's written
13 now would be that the damper positions could change.
14 It did seem like the tolerances is only applicable to
15 the full load test.

16 So if we could add a provision in there to
17 say that once the full load test is compliant with
18 this, the static split -- the test setup does not
19 change for the other three test conditions.

20 MR. WINNINGHAM: Mark, this is Dave with
21 Lennox. If you could be a little bit more specific.
22 I agree with your intent, but what you're stating is
23 the -- whatever damper position for the return stays
24 in that same position for the entirety of the test.

25 MR. FALTERMEIER: Yeah. That makes sense.

1 I think that the thought process was you set it, the
2 cooling test, with the tolerance, and those dampers
3 aren't adjusted for any limiting tests.

4 MR. ALATORRE: This is Mark with PG&E. I
5 think if we can -- if that could be reflected. Maybe
6 it has that now on the WebEx, but --

7 MR. WESTPHALEN: So after setting the return
8 air duct flow restriction to meet this requirement in
9 the full load test, the damper position may not change
10 for the other tests maybe. After setting the return
11 duct flow restriction for the full load cooling test,
12 the setting remain unchanged for the other tests.

13 (Pause.)

14 MR. ROBERTS: Thoughts on any of the
15 modifications to 12?

16 (Pause.)

17 MR. RILEY: If I'm interpreting this
18 correctly, that requirements means that the splitter
19 return and supply static is just for full load, but
20 leave the damper position on the return duct for part
21 load tests, and take what you get.

22 MR. WESTPHALEN: And the expectation is
23 you'll have the same split for all of the other tests
24 because you're controlling the full external static
25 pressure according to the square of the air flow.

1 MR. RILEY: I guess that's probably the
2 assumption. I just -- I'm hopeful that's what the
3 data shows, but I'm just making sure that if for some
4 reason it does this, as we're -- it should be close,
5 but as we're adjusting the supplies, the code test on
6 the supply side, I just don't have through my mind yet
7 what happens on the return air or that split.

8 MR. ROBERTS: Okay. Let's take a consensus
9 vote on recommendation 12. I see 11 up in the room.
10 Thanks, Joe. Sorry about that.

11 MS. WILLIAMS: So we have some revision to
12 something, these. This one? Per the suggestion, we
13 did double-check the outdoor dry bulb temperatures,
14 and it was the wrong output. So we have updated it,
15 and this is the new load line, which looks slightly
16 little better, I think.

17 And comparison to the industry lines, so
18 they intersect. You can ignore the orange, oh they're
19 the same. Whatever.

20 MR. LORD: Are these the actual
21 temperatures?

22 MS. WILLIAMS: Yes. They are. They've been
23 input right here into the term sheet. And we also
24 added the hours for ventilation, which is 5:15, and
25 for crankcase heat, which is 15:48.

1 (Background discussion.)

2 MR. YOUNG: This is Scott from LBNL. I
3 think we basically took -- there's a number for
4 crankcase heat hours for CUACs in IVEC. And then
5 there was a crankcase heat number for summertime for
6 CUHPs in IVEC. And then took the difference between
7 those two, and then took out the number of hours that
8 are in the total heating load line for heating hours,
9 and then figure that difference is the total amount
10 remaining that should be added.

11 MR. LORD: Can you maybe jot that down so we
12 can review it?

13 MR. YOUNG: Yeah. For sure. Yeah. I'll
14 put it in a spreadsheet, and send it out.

15 MS. WILLIAMS: We already voted on that one,
16 so I don't know if you all want to revote, or --

17 MR. ROBERTS: I think now we can wrap up the
18 body of the term sheet, and go to 11 for furnace fan.
19 And I don't think there's any new conversation, but
20 just for posterity sake, we can take a consensus check
21 on recommendation number 11.

22 Do you want to vote? Seven down, four up,
23 one sideways in the room. So we are not in consensus
24 on recommendation 11. And so what we'll do now is
25 that will be stricken from the term sheet as it

1 currently exists.

2 We'll go through the appendices, and then
3 we'll vote on the term sheet.

4 MR. ALATORRE: One question. This is Mark
5 with PG&E. Were we taking the consensus check on
6 what's in the track changes as the number one option,
7 and then the fallback being the metric? Because what
8 I've heard a few of you say that they were comfortable
9 with it being part of the IVEC standard.

10 MR. ROBERTS: I don't think it would go in
11 this term sheet if that was the case. I could be
12 mistaken, but that's my understanding.

13 MS. HOOTMAN: No. We would be comfortable
14 with talking about it in ECS, not in the test
15 procedure. Jill Hootman, Trane.

16 MR. ALATORRE: This is Mark. Is that what's
17 in the red underline that would be addressed as part
18 of the stringency of IVEC standard during energy
19 conservation negotiations?

20 MS. HOOTMAN: You would still be stating it
21 at test procedure on indoor fan control values here,
22 and we are not in favor of that.

23 MS. WILLIAMS: I think Ashley was trying to
24 write it as like the part -- this recommendation may
25 not be fully implemented. Would mean that the test

1 procedure provisions would not be finalized if these
2 conditions were met.

3 MR. WINNINGHAM: This is Dave with Lennox.
4 I guess our position is that we would -- we're
5 recommending to take this out, and we will discuss it
6 with potentially considering something if during the
7 ECS, but not consideration of a metric in the test
8 procedure.

9 MR. ROBERTS: Hearing from the Department,
10 they might want to discuss this a little bit more
11 tomorrow. So the question becomes where do we want to
12 spend the rest of our Wednesday afternoon on.

13 Onto the appendices? Okay. There's three
14 appendices. There's too much feedback on who
15 comprised the working group. But on appendices A and
16 B, any feedback on what is currently in the term
17 sheet? I guess we'll take A first. I'm sorry, I meant
18 appendix B.

19 MR. TEAKELL: Kevin Teakell, AAON. So this
20 still has some of this Qimech equation.

21 MS. WILLIAMS: It's actually struck out.
22 You just can't tell. I can actually delete it.

23 MR. TEAKELL: Okay. Maybe you want to take
24 out the strikeouts or something. Okay, thank you.

25 MR. ROBERTS: Any additional feedback on B?

1 MR. TEAKELL: Kevin Teakell, AAON. So one
2 of the things we had a concern with is that the
3 measurement of the control power basically had taken
4 total unit power minus -- you know, you're taking some
5 really big powers, and subtracting them to get a very
6 small one, and worrying about the resolution on that
7 with just the sensors --

8 I'm not saying I've got a solution to that.
9 Just that we may see some problems when we get to
10 test on that. But, you know, maybe talking 40/100
11 watts for this control power, and an overall unit
12 wattage maybe 10,000 watts or something. So measuring
13 something that small could be difficult to get
14 accuracy there.

15 MR. WESTPHALEN: Just wondering if there's a
16 suggestion on -- I mean, clearly, the more power
17 analysis you apply to it, the better you can do.

18 MR. TEAKELL: Yeah. I'm struggling with
19 that one. So it's more a comment than anything. I
20 don't know that I've got a solution.

21 MR. ROBERTS: Any other comments, or
22 concerns in appendix B?

23 MR. RILEY: This is Pat. I'm not sure if
24 others share my concern here or not, but there is an
25 immense amount of information here, and we can't --

1 right now we don't have the time to go through it, you
2 know, every last variable, every last subscript.

3 Is there anything that we can put in the
4 term sheet, maybe somewhat of a QC standard, as we
5 start running calculations of all these formulas that
6 if we find something incorrect, that we bring it back
7 to the group for an update?

8 MS. WILLIAMS: This is Alison. I mean, I
9 think we've done that before to some extent, but we
10 might want fairly tight language that it is restricted
11 to QC, and not like full revision.

12 MR. WINNINGHAM: I guess, Alison -- this is
13 Dave. If it doesn't change the intent, then it's just
14 a correction.

15 MR. ROBERTS: That's consistent with what
16 we'd done earlier today, which is like we're most of
17 the way there pending some final review.

18 Tim, do you have language in mind that you
19 think would speak to that?

20 MR. RILEY: Are you talking to me?

21 MR. ROBERTS: Pat. Sorry.

22 MR. RILEY: That's okay. This is Pat, from
23 Carrier. I don't. I mean, there were some QC
24 statements in here in the term sheet already. I don't
25 know if they even work for this section as well, but,

1 I mean, as Dave said, it's more not to change the
2 intent, just a correction.

3 MR. WINNINGHAM: And this is Dave, Lennox.
4 I believe there is two other QC statements up in the
5 above.

6 MS. WILLIAMS: Does this one look okay to
7 you?

8 MR. WESTPHALEN: Can we have that apply to
9 all the appendices?

10 MS. WILLIAMS: Yeah. I will move it when
11 it's agreed to. Is everyone good?

12 MR. ROBERTS: Anything else on appendix B?

13 Okay. Let's take a consensus check on
14 appendix B. Okay, we are very in consensus on
15 appendix B. Appendix C, and then we're going to move
16 down that one QC statement as well. Apologies, Joe.

17 Any feedback, or questions on anything in
18 appendix C?

19 MR. WESTPHALEN: Yes. There will be some
20 discussion of the potential that have cut-outs that
21 don't allow to operate 17. And so we're thinking we
22 want -- currently the way it's written, it has the
23 delta, the cut-out term only for the case where the
24 building load is greater than the highest stage
25 capacity, and that was based on the expectation that

1 you only get to the cut-outs when you have that case
2 happening; however, if that occurs above 17, then the
3 cut-out equation probably should apply to all of the
4 cases. For example, if you're interpolating between a
5 high stage and a low stage at 20, for example.

6 So I think we can resolve that just by
7 observing the deltas in the equations for the other
8 cases as well. And then we would also have to make
9 some revisions to indicate that the resistance heat
10 would have to provide any balance of heating below the
11 cut-out.

12 MR. TEAKELL: Kevin Teakell, AAON. So if it
13 doesn't run at 17, how do you do the interpolations
14 since it only ran at 47 then?

15 MR. WESTPHALEN: So it's my understanding is
16 that generally if a unit has come into the lab with
17 cutouts that don't allow it to operate quite down to
18 17, that they've been overridden, and the test has
19 been conducted. And so that would be the idea here,
20 you could still do that in the test. But then
21 obviously there's going to be cut-outs that --

22 MR. TEAKELL: So you're saying override the
23 cut-outs, run the test, and then apply the flow, and
24 heat, and all that?

25 MR. WESTPHALEN: Right. Apply the cut-out

1 approach.

2 MR. TEAKELL: But you ran the test just to
3 get the line.

4 MR. WESTPHALEN: Exactly.

5 MR. TEAKELL: Okay.

6 MS. HOOTMAN: Do you need to change any of
7 the language for that?

8 MR. WESTPHALEN: There will be a lot of
9 little changes required. I think we represent all
10 that. So maybe the thing to write in is provisions to
11 be added to address units that have cutouts that don't
12 allow operation at 17.

13 MR. ROBERTS: Anything else in appendix C?

14 All right. Hearing no additional comments,
15 or concerns, let's take a consensus check on appendix
16 C. Seeing 11 thumbs up in the room. Thank you, Joe.
17 Twelve thumbs up.

18 All right. So I think the only outstanding
19 item here, and outstanding in that it was the only
20 item that we are not in consensus on, here's a
21 question that I actually got through Ashley.

22 I'll kind of phrase it in my own way. Which
23 is hearing manufacturers' concern about expressly
24 tying them to discussing furnace energies in the
25 heating metric. Is there some way that tonight they

1 wouldn't mind -- they are able to circulate language
2 that speaks to that concern, but also perhaps
3 indicates a commitment to potentially talking about
4 this element in ECS?

5 Alison? I knew I was going to mess it up.

6 MS. WILLIAMS: I'm not entirely sure that's
7 the intent, but, I think, the requested is to try to
8 come up with language that addresses DOE'S position
9 that has been expressed multiple times that you would
10 be able to sign off on.

11 MR. WINNINGHAM: So Alison, this is Dave.
12 Is that -- is DOE coming up with the language?

13 MS. WILLIAMS: No. That would your all's
14 language that you will be willing to vote on, but that
15 it's responsive to DOE'S position. And if you have
16 questions, I'm sure you could ask someone.

17 MR. WINNINGHAM: I just wanted to clarify
18 who is doing -- who is doing what.

19 MR. ROBERTS: So with that, any questions at
20 all for the Department, for one another? And tomorrow
21 it would just be reviewing that language, and then
22 reviewing the term sheet in its entirety.

23 MR. ALATORRE: This is Mark with PG&E. So
24 the changes to appendix C to address the cutouts, and
25 all that, will be reviewable tomorrow? Is that what

1 you said? I still don't understand what we're going
2 to do.

3 MR. WESTPHALEN: Maybe.

4 MR. ALATORRE: No pressure.

5 MS. RIVEST: Hi, everyone. So apparently
6 there's supposed to be some bad weather in D.C. early
7 tomorrow morning. So there might be a case where DOE
8 has like a delay, and so that can be checked at
9 OPM.gov, in which case we will probably just start
10 late. And then we'll circulate an email. Usually at
11 5:00 a.m. is when they find out.

12 MR. TEAKELL: So you're saying you would
13 send out an email if it's going to be late?

14 MS. RIVEST: Right. Unless people want to
15 override it, which apparently is a possibility.

16 MS. WILLIAMS: I think this happened during
17 one other negotiation, and somehow we still got in the
18 building. Yeah?

19 MS. HOOTMAN: We did. We had a delay with
20 no --

21 MS. WILLIAMS: But didn't we still come?
22 Anyway, we probably don't need to discuss this.

23 MS. HOOTMAN: We came a little bit later,
24 you know, instead of 8:00 start, or whatever it was,
25 we would be coming in at 10:00.

1 MS. WILLIAMS: So how about what the
2 Department says though? Can you estimate confirming
3 start time?

4 MS. SKIDD: This is Allison. So there
5 wouldn't be a situation where even with a delayed
6 start we would start on time virtually. We would just
7 postpone the start of the meeting.

8 (Background discussion.)

9 MR. ROBERTS: We can probably go off the
10 record now to discuss this.

11 (Brief break from 4:15 p.m. to 4:38 p.m.)

12 MR. ROBERTS: It's tomorrow. Before we hear
13 from manufacturers on where their thinking is on 12
14 right now, or 11, whichever one, I know that Alison
15 had a few brief number updates. So, I'll turn the
16 microphone over to her.

17 MS. WILLIAMS: We just realized
18 recommendation number 2 did not have version 17
19 numbers that we updated them. They're like two
20 numbers apart. So it isn't inconsequential change.

21 MR. YOUNG: Also, Scott with LBNL. The
22 crankcase heat numbers here will get updated because
23 the totals of the other IVEC numbers are a little
24 higher now. So those crankcase heat hours will go
25 down. So we're not including more than 8,760 hours in

1 a year.

2 (Background discussion.)

3 MR. ROBERTS: Any questions, comments?

4 MS. MAUER: This is Joanna. I think I maybe
5 have two additional concerns with the language. One
6 is that it seems to be kind of prejudging that IVEC
7 will, in fact, adequately capture fan energy.

8 And I think my other concern -- well, I
9 guess I'm not opposed to manufacturers providing an
10 analysis, but I'd kind of like to also see DOE'S
11 analysis of this question.

12 MR. THARP: Rusty Tharp, Daikin. And thank
13 you for that. And as was stated earlier, the
14 manufacturers feel quite confident that what is there
15 in the IVEC, and IVHE, do address the situation, the
16 concern that is there.

17 And we have no issue with an analysis
18 policy, including stuff done by DOE, and the
19 consultants, and anyone else that's basically having
20 an analysis that's part of the ECS system to validate
21 the position.

22 MS. MAUER: This is Joanna. I mean, I guess
23 maybe -- give Rusty a break clearly, but maybe the
24 issue is so what if the analysis -- I understand that
25 you're confident, but what if the analysis doesn't

1 show that it's adequately capturing?

2 MS. ARMSTRONG: Ashley, agreed.

3 MR. THARP: Rusty Tharp, Daikin. In the 001
4 percent chance that that might happen, we did not
5 consider that option.

6 And I'll just throw in, if I may, that a
7 couple other items that we have discussed that we have
8 not thrown on the table yet. One of our concerns
9 about the proposal, at least as was written in even
10 the A metric of such nature, is one of the things with
11 specifically that particular option take the 848 test
12 or watts, however you want to look at it.

13 What that actually does is that incites
14 manufacturers to break at a lower air flow rate. So
15 that actually can be counterproductive to the overall
16 intent because it's a cfm/watt. The lower the air
17 flow rate you have, the lower your power consumption
18 is going to be on a cfm/watt basis. So as such, that
19 really may not be where you want to go.

20 And there are some other areas that we could
21 discuss, but we also discussed a lot of them, so I'll
22 just leave it at that.

23 MS. ARMSTRONG: So I think the issue is the
24 language at the bottom, which I did just make a few
25 changes to. I'm happy to add just to make it less

1 leading. I'm happy to completely understand that
2 there's 99.9 percent chance where it lands.

3 The problem is there needs to be -without
4 the first statement, without the first paragraph,
5 there's no what if, right? There's no commitment by
6 you guys, by us, by others around the table, to say it
7 will be addressed either this pathway, or that
8 pathway, and that's the goal with paragraph 1.

9 And so the point of paragraph 1 is to say
10 here's our fallback. We're all hoping that we go this
11 way. We welcome you guys to illuminating us with the
12 analysis, and then it just depends on levels at that
13 point.

14 And I have complete faith that that's all
15 going to work out, but, if not, I'm back to
16 negotiating the same point. And I really don't want
17 to negotiate the same point, which is why I really
18 prefer a fallback there. Not that I ever hope to have
19 to use it.

20 MR. WINNINGHAM: This is Dave with Lennox.
21 I appreciate your perspective, and I appreciate
22 Joanna's perspective, but we made significant changes
23 to where fan energy is going to have bigger impact on
24 the total outcome. I don't think anyone can debate
25 that.

1 We're taking an approach that is putting the
2 burden on manufacturers to, okay, demonstrate to me a
3 level that shows -- that meets my criteria. And we
4 have no idea what that criteria is.

5 And I think our approach is we strongly
6 believe that the metrics we have put in place
7 adequately capture fan performance, and will be a
8 significant factor that manufacturers have to consider
9 going forward.

10 And kind of putting the cart before the
11 horse so to speak, it just takes away the kind of
12 burden to demonstrate that it's needed.

13 MS. ARMSTRONG: I mean, I think we're past
14 the part of demonstrating need, right? We identified
15 an energy use. I'm not saying needs to be separate or
16 regulated. I'm to saying how it should be. I'm not
17 jumping to an outcome. I'm saying to be
18 representative, we have a portion of the energy use
19 that may or may not be accounted for.

20 And whether or not -- I would agree with
21 you, we've made great strides as a team across the
22 aisle on all sides here. We're going to a place
23 that's a much better place for incenting more
24 efficient fans, et cetera, along with all these other
25 things.

1 I think how far that ends up going is yet to
2 be determined. We're all going to be moving towards
3 this next stage with the best faith.

4 But it's not a question, right, whether --
5 we have a previous term sheet. We have things on the
6 table that they have not addressed.

7 And so my point here is to close the gap,
8 and address it in the term sheet. I'm not saying how,
9 but I am saying these are two avenues, and we need to
10 make a decision, and we're committing to make that
11 decision here, and not somewhere else. We're not
12 leaving it on the table again.

13 MR. WINNINGHAM: As part of those
14 negotiations and that determination, CUAC and CUAFF are
15 both included in those, and it's not absolutely clear
16 that the CUAC has to bear the burden of CUAFF fan
17 energy.

18 MS. ARMSTRONG: And if that is -- honestly,
19 like we can sit here and edit this all night long, but
20 if that's where we're going, if we're going back
21 there, that's where we are, and you say, DOE, you deal
22 with it. But your guiding principles that you started
23 with of same timeline, all these other things, not
24 separate redesigns, are off the table at that point.
25 Do you want to chat?

1 MS. MAUER: This is Joanna. I guess I'm
2 just trying to understand because I think with the two
3 paragraphs combined, I think what they say is if you
4 guys are correct, if you're correct, then at the end
5 of the day we're all going to decide that fan energy
6 is adequately captured. But, I think, the paragraphs
7 are saying the metric goes away. So why is that a
8 problem?

9 MR. WINNINGHAM: What is your threshold to
10 say that that's okay?

11 MS. MAUER: I mean, I think we would have to
12 assume that we're reasonable people around the table
13 is I guess what I would say.

14 MR. WINNINGHAM: Five minutes?

15 MR. ROBERTS: Take all the time you need.
16 You all have just been meeting out in the hallway,
17 right? Yeah. Take all the time you need.

18 (Brief break from 4:51 p.m. to 5:30 p.m.)

19 MR. ROBERTS: All right. I think we're
20 going to go back live once, so we can display the new
21 proposed language for recommendation 11.

22 (Pause.)

23 MR. ROBERTS: All right. If folks want to
24 turn their attention to the webex, the screen for --
25 If you want to pull up the term sheet, and review the

1 revised recommendation 11. The industry do you want
2 to talk through how you arrived at this. Or no?

3 MR. THARP: We listened to Ashley. We met,
4 and discussed. We met, and discussed the topic, and
5 we came up with this.

6 MS. ARMSTRONG: So I think what the
7 important part here is the commitment that we will be
8 dealing with the furnace fan, energy use, and heating
9 mode, in this rulemaking.

10 Now, what's left on the table heavily
11 informed by an analysis that's committing to be done
12 on exactly how, and what that looks like.

13 Essentially what it says is we're going to
14 look at the stringency of the levels first, and we're
15 going to look at the levels just period. And informed
16 heavily by the analysis that's going to be done, and
17 if we're all comfortable with that, it's not going to
18 be addressed in a separate metric.

19 If we're uncomfortable with that, then we
20 are committing to address it in a separate metric in
21 this rulemaking, and that's the important part for the
22 Department. So with that, the Department is
23 comfortable.

24 MR. THARP: Rusty Tharp, Daikin. So we --
25 so this would be the entirety of -- that paragraph

1 would be the entire recommendation evidence?

2 MS. ARMSTRONG: That's correct.

3 MR. THARP: Thank you.

4 MR. ROBERTS: Any final questions on this?

5 MS. MAUER: This is Joanna. I don't want to
6 prolong this, but my preference would be to slightly
7 edit the first sentence so that we're not
8 predetermining the result of the analysis, but to
9 participate in an analysis to evaluate, or to evaluate
10 whether the agreed upon value is adequately captured
11 in fan energy.

12 MS. SKIDD: Or validate the assumption that,
13 because that's more where we're at here.

14 MS. MAUER: That would be fine. And, I
15 guess I just want to understand maybe the intent of
16 manufacturers commit to developing a metric. I mean,
17 I think the working group would need to agree to that.

18 MR. THARP: Rusty Tharp, Daikin. Similar to
19 the first paragraph, manufacturers commit to
20 participating in the development of the work that's
21 been --

22 MR. RILEY: Yeah, that's good. Can we
23 further clarify that it would be committed to
24 developing a separate metric? Is that a no?

25 Sorry. Strike that. Separate comment.

1 MR. ROBERTS: Anything else? All right.
2 Well, let's take a consensus check on recommendation
3 11.

4 MR. ALATORRE: Sorry. I had one.

5 MR. ROBERTS: No. Go ahead, Mark.

6 MR. ALATORRE: Do we need to be more
7 specific in efficient air moving systems?

8 MS. ARMSTRONG: Bring it to the standards
9 negotiation.

10 MR. ROBERTS: All right. Now, let's take a
11 consensus check on recommendation 11. Thank you, Joe.
12 I think we're all up in the room.

13 And then the final consensus check on the
14 entirety of the term sheet.

15 MS. WILLIAMS: Let me just comment that
16 Detlef implemented whatever he was supposed to do in
17 appendix C. So that's in there, and we changed some
18 numbers. So appendix C is updated.

19 MR. ROBERTS: Any final comments on the term
20 sheet. Otherwise, we can take a consensus vote on
21 adopting the term sheet in its entirety.

22 MS. ARMSTRONG: You guys want to vote in the
23 morning. Yes?

24 MR. ROBERTS: Vote in the morning. Okay.

25 MS. WILLIAMS: Virtually?

1 MS. ARMSTRONG: You can be virtual.

2 MR. ROBERTS: 10:00 a.m. start?

3 MS. ARMSTRONG: Whatever you want to do.

4 MR. ROBERTS: The brave souls who stuck
5 around on WebEx, picking up live tomorrow at 10:00
6 a.m.

7 (Whereupon, at 5:45 p.m., the meeting in the
8 above-entitled matter adjourned, to reconvene at 11:00
9 a.m. the following day, Thursday, December 15, 2022.)

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REPORTER'S CERTIFICATE

DOCKET NO.: EERE-2022-BT-STD-0015

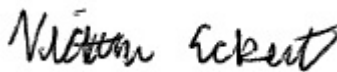
CASE TITLE: Commercial Unitary Air Conditioners and
Heat Pumps ASRAC Working Group Meeting

HEARING DATE: December 14, 2022

LOCATION: Washington, D.C.

I hereby certify that the proceedings and
evidence are contained fully and accurately on the
tapes and notes reported by me at the hearing in the
above case before the U.S. Department of Energy,
Office of Energy Efficiency & Renewable Energy.

Date: December 20, 2022



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