In The Matter Of:

Application from NTE Connecticut, LLC

Siting Council Hearing

January 10, 2017

BCT Reporting LLC

PO Box 1774

Bristol, CT 06010

860.302.1876

Original File 10Jan2016 CT Siting Doc 470 LP1016 1100-1350 194pgs.txt

Min-U-Script®

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Docket No. 470

Application from NTE Connecticut, LLC for a Certificate of Environmental Compatibility and Public Need for the Construction, Maintenance, and Operation of a 550-Megawatt Dual-Fuel Combined Cycle Electric Generating Facility and Associated Electrical Interconnection Switchyard Located at 180 and 189 Lake Road, Killingly, Connecticut

Siting Council Hearing held at the Connecticut Siting Council, 10 Franklin, Square, New Britain, Connecticut, Tuesday, January 10, 2017, beginning at 11:00 a.m.

H e l d B e f o r e:

ROBIN STEIN, Chairman

A p p e a r a n c e s:

Council Members:

JAMES MURPHY,
Vice Chairman

ROBERT HANNON,
DEEP Designee

LARRY LEVESQUE, ESQ.
PURA Designee

MICHAEL HARDER
DANIEL P. LYNCH, JR.
ROBERT SILVESTRI

Council Staff:

MELANIE BACHMAN, ESQ.,
Executive Director and
Staff Attorney

MICHAEL PERRONE
Siting Analyst

A p p e a r a n c e s:(cont'd)

For NTE CONNECTICUT, LLC:

ROBINSON & COLE, LLP
280 Trumbull Street
Hartford, Connecticut 06103-3597
BY: KENNETH C. BALDWIN, ESQ.
JAMES P. RAY, ESQ.

For THE SIERRA CLUB:

50 F Street NW., 8th Floor
Washington, D.C. 20001
BY: JOSHUA BERMAN, ESQ.

For NAPP, and THE WYNDHAM LAND TRUST:

REID & RIEGE
One Financial Plaza
Hartford, Connecticut 06103
BY: JOHN BASHAW, ESQ.
MARY MILLER, ESQ.

For CONNECTICUT FUND FOR THE ENVIRONMENT:

900 Chapel Street
Upper Mezzanine,
New Haven, Connecticut 06510
BY: JOHN LOONEY, ESQ.

THE CHAIRMAN: Good morning, ladies and gentlemen. I'd like to call to order the hearing on Docket 470 of the Siting Council today, Tuesday, January 10, 2017. My name is Robin Stein. I'm Chairman of the Siting Council.

This evidentiary hearing is a continuation of the hearings held on October 20, 2016; November 3, 2016; November 15, 2016; and December 15th, also in 2016. It's held pursuant to the provisions of Title 16 of the Connecticut General Statutes, and of the Uniform Administrative Procedure Act, upon an application from NTE, Connecticut, LLC, for a certificate of environmental compatibility and public need for the construction, maintenance and operation of a 550-megawatt dual-fuel combined-cycle electric generating facility, and associated electrical interconnection switchyard located at 180 and 189 Lake Road in Killingly, Connecticut. The application was received by the Council on August 17, 2016.

A verbatim transcript will be made of the hearing and deposited at the town clerk's offices in Killingly, Pomfret and Putnam Town

Halls for the convenience of the public.

I wish to call your attention to the items shown in the hearing program marked as Roman numeral 1D, items 1 through 109.

Does the applicant or any party/intervener have any objection to the addition of item 11 that the Council has administratively noticed?

(No response.)

THE CHAIRMAN: Hearing and seeing none, accordingly the Council hereby administratively notices this existing document. We will proceed in accordance with the prepared agenda, copies of which are available over by the door, I believe, or in that general area.

I have a motion for Joshua Berman to appear pro hac vice, dated December 23, 2016.

Attorney Bachman, would you please comment?

MS. BACHMAN: Thank you, Mr. Chairman.

At the time that the Sierra Club had requested party status we were aware of the fact that the pro hac vice rule was going to change as of January 1. And so we conditioned

their status on the submission of an application. They will appear pro hac vice on or before the 31st of December, which they did, and therefore staff recommends that we approve the motion and grant them full status.

THE CHAIRMAN: Do I have A motion?

MR. HANNON: I'll move it.

MR. MURPHY: Second.

THE CHAIRMAN: All those in favor, signify it by saying, aye.

THE COUNCIL: Aye.

THE CHAIRMAN: Opposed?

(No response.)

THE CHAIRMAN: The motion carries.

And I have a motion for leave to file surrebuttal testimony from the Sierra Club, and Not Another Power Plant dated December 22, 2016. Again Attorney Bachman, please?

MS. BACHMAN: Thank you, Mr. Chairman.

In the closed proceeding on December 15th we did have the pleasure of having the opportunity to cross-examine Mr. Fagan. On portions of the topics that were confidential. He has submitted additional rebuttal testimony that

is not confidential and he is available today for cross-examination this afternoon on that rebuttal testimony. So staff recommends that we grant the motion.

MR. MURPHY: So moved, Mr. Chairman.

MR. HANNON: Second.

THE CHAIRMAN: All those in favor, signify it by saying, aye.

THE COUNCIL: Aye.

THE CHAIRMAN: Opposed? Abstention?

(No response.)

THE CHAIRMAN: The motion carries.

We have a request from NTE for their proposed redactions to the December 15, 2016, closed proceeding transcript dated December 29, 2016.

Attorney Bachman, please?

MS. BACHMAN: Thank you, Mr. Chairman.

During the holidays the closed proceeding transcript actually came in earlier than we expected. It was expedited, and so the parties who have signed the nondisclosure

agreement through e-mail have reviewed the confidential transcript and the proposed redactions by NTE. There are no objections, and therefore staff recommends that we grant that request.

MR. MURPHY: I'll move approval, Mr. Chairman.

MR. HANNON: Second.

THE CHAIRMAN: Motion and a second. All those in favor, signify it by saying, aye.

THE COUNCIL: Aye.

THE CHAIRMAN: Opposed? Abstention?

(No response.)

THE CHAIRMAN: The motion carries.

I have a request from NAPP/WLT for a submission of prefiled testimony of witnesses with Karen Johnson, Jason Anderson, Charlotte Desautels, Carolyn Johnston, and Benjamin Williams, as full exhibits without cross-examination.

Again Attorney Bachman, please?

MS. BACHMAN: Thank you, Mr. Chairman.

Again during the holidays Attorney

Bashaw respectfully had just requested all the parties to indicate whether or not they had some cross-examination for the Killingly resident witness panel. And we gave a 48-hour period for everyone to indicate whether or not they had cross, including this Council and our staff. And no one indicated that they had any cross.

So therefore, I recommend that the Council grant this request to admit those exhibits as full exhibits without cross-examination.

THE CHAIRMAN: Okay. Do I have a motion?

MR. MURPHY: I'll move approval, Mr. Chairman, if there's no objections today.

THE CHAIRMAN: Second?

MR. HANNON: I'll second.

THE CHAIRMAN: All those in favor signify by saying aye.

THE COUNCIL: Aye.

THE CHAIRMAN: Opposed? Abstention?

(No response.)

THE CHAIRMAN: The motion carries.

We have a request from the Sierra Club for supplemental administrative notice items,

plural, dated January 9, 2017.

Again Attorney Bachman, do you wish to comment?

MS. BACHMAN: Aside from the 24-hour notice of the request for the administrative notice items, that hopefully everyone did have at least an opportunity to check the links and see what the substance of those items are about. Staff does recommend that the request be granted, Mr. Chairman.

THE CHAIRMAN: Motion?

MR. MURPHY: So moved, Mr. Chairman.

THE CHAIRMAN: Second?

MR. HANNON: Second.

THE CHAIRMAN: I also would just like to comment that, if I am correct, today is January 10th. And it's really not appreciated with the volume of material that we have been receiving that we get additional items one day in advance. So I'm going to support the motion to allow this for what it's worth.

I would ask that all parties in this matter get any material they want before this Council, so we can make an intelligent ultimate

decision, to us with more than 24-hour notice.

I have a motion and a second. All those in favor signify it by saying, aye.

THE COUNCIL: Aye.

THE CHAIRMAN: Opposed? Abstention?

(No response.)

THE CHAIRMAN: The motion carries.

Okay. We're going to begin with cross-examination of the applicant by the group parties, not Another Power Plant, Sierra Club and the Wyndham Land Trust, to be followed by cross-examination of the applicant by the Connecticut Fund for the Environment.

MR. BALDWIN: Mr. Chairman, as Mr. Bashaw gets ready for his cross-examination we had one homework assignment from the last hearing. Perhaps we could deal with that right upfront with respect to some questions asked by Mr. Ashton?

THE CHAIRMAN: Okay. Sure.

MR. BALDWIN: Chris Rega on our witness panel, who's already sworn, will address that more direct response to Mr. Ashton's question.

F R E D S E L L A R S,
G E O R G E L O G A N,
L Y N N G R E S O C K,
K E V I N F O W L E R,
M A R K M I R A B I T O,
T I M E V E S,
C H R I S R E G A,
M I K E B R A D L E Y,
N O R M T H I B E A L T,
S C O T T H E S K E T H,
recalled as witnesses, having been previously sworn, were examined and testified on their oaths as follows:

THE WITNESS (Rega): Thank you.

Last time Mr. Ashton had indicated that our facility would need to coordinate our outages with an organization called NEEPC. Since last time we did a little bit of research, and this organization NEEPC is an organization that no longer exists anymore, but -- but its function is now handled by ISO New England.

And so we just want to clarify that, you know, of course we would, you know, coordinate. You know, Mr. Ashton is right. We'd

certainly coordinate, but we would coordinate with ISO New England and Eversource, of course, for all of our outages. And then at that point, you know, we could certainly isolate our facility to ensure the safety of our maintenance personnel.

THE CHAIRMAN: Okay. Thank you for the clarification. So I will begin by -- oh, everybody is sworn in. Correct? Okay.

You want to begin your cross-examination?

MR. BASHAW: Thank you.

Good morning. Again, John Bashaw with Reid & Riege. With me is Mary Miller, also of Reid & Riege. We represent the Not Another Power Plant, and the Wyndham Land Trust in this particular matter.

I'd like to begin discussion today with appendix L, the sound survey and analysis report. And there was a supplemental report of October 27, 2016. Both prepared by Tetra Tech.

Okay. I believe, Mr. Fowler, I believe I'll be directing my questions to you. Is that correct?

THE WITNESS (Fowler): Or --

(Audio feedback.)

THE CHAIRMAN: This is the updated system.

MR. BASHAW: I will try again. Back on November 15th we started discussing the Exhibit L, which is the sound survey prepared by Tetra Tech. Do you recall that?

THE WITNESS (Fowler): Yes.

MR. BASHAW: And that's the report that you prepared or had some assistance in preparing?

THE WITNESS (Fowler): Correct.

MR. BASHAW: And after preparing that report, which is dated June of 2016, Tetra Tech prepared an updated acoustic modeling analysis. Do you recall that?

THE WITNESS (Fowler): Yes.

MR. BASHAW: And that's dated October 27, 2016?

THE WITNESS (Fowler): Correct, yeah.

MR. BASHAW: And with respect to the update, is that a fair characterization that what the update did was take into account a revised site plan?

THE WITNESS (Fowler): Correct,

yes.

MR. BASHAW: And other than that the information that's in Exhibit L, the original report is still accurate and correct?

THE WITNESS (Fowler): Correct. We also added some of the intervening structures towards Alexander Lake, too.

MR. BASHAW: Okay. So if I could direct your attention to Exhibit L, please? And I'm assuming that we can agree that the KEC facility is going to be constructed in what's correctly classified as a class-A noise zone under the DEP noise regulations?

THE WITNESS (Gresock): That's correct.

MR. BASHAW: And a class-A noise zone is defined in the regulations as residential areas where human beings sleep, or areas where serenity and tranquility are essential to the intended use of the land. Is that correct?

THE WITNESS (Gresock): I don't have the definition right in front of me.

MR. BASHAW: But that, but a class-A noise zone would be defined in the DEP regulations. Correct?

THE WITNESS (Gresock): That's correct.

MR. BASHAW: And in contrast to a class-A noise zone, what's a class-C noise zone under the DEP regulations?

THE WITNESS (Gresock): A class-C noise zone is an industrial zone.

MR. BASHAW: So it includes manufacturing activities, transportation facilities, warehousing, military bases and mining. Correct?

THE WITNESS (Gresock): Among other items, yes.

MR. BASHAW: And you have been, of course, to the proposed KEC site. Have you not?

THE WITNESS (Gresock): We have.

MR. BASHAW: And you would agree with me that currently at the KEC site there are no manufacturing activities or other class-C noise activities on the KEC parcel?

THE WITNESS (Gresock): That is correct.

MR. BASHAW: And in fact, those type of activities are not being performed on any other parcels that directly abut the KEC parcel.

Correct?

THE WITNESS (Gresock): In proximity, but not directly abutting.

MR. BASHAW: But not directly abutting. So all of the properties that will abut the KEC facility and after construction of the plant will be class-A noise receptors under the DEP regulations. Is that correct?

THE WITNESS (Gresock): We have treated them that way, yes.

MR. BASHAW: And that's not going to change as a result of the construction of the plant. Correct? Receptors will still remain class-A noise receptors?

THE WITNESS (Gresock): And -- and we have treated them as such, yes.

MR. BASHAW: Now I'm going to direct your attention to table 2 on page 6 of Exhibit L. And just so I can understand the table, any noise that currently emits -- currently emits from the KEC property line would be required to meet the class-A daytime standard of 55 decibels. Is that correct?

THE WITNESS (Gresock): Or a residential land use emitting to another class 1-A

area. The daytime restriction is 55.

MR. BASHAW: Okay. And the nighttime is 45?

THE WITNESS (Gresock): That's correct.

MR. BASHAW: And that's measured at the boundaries of the property?

THE WITNESS (Gresock): Of the receiving property, yes.

MR. BASHAW: Which in this case, since I'm talking about the abutting properties, is also the property line of the KEC property?

THE WITNESS (Gresock): That's correct.

MR. BASHAW: Now based upon your analysis and the report, solely because KEC wants to construct an industrial emitter on the KEC facility you use the class-C industrial emitter category?

THE WITNESS (Gresock): The class-C emitter category was selected because of the type of facility proposed as is specified in the local zoning ordinance. It states where multiple uses exist within a given zone district, the least restrictive land-use category for the emitter and

receptor shall apply.

And in this case since what we were evaluating was the presence of the proposed facility in the location, yes, that is what we chose to do.

MR. BASHAW: Okay. And I just want to clarify one thing. I'm only talking about the DEP regulations right now, and you referred to local. So for now I'm just referring to the DEP regulations. So the question, that is solely because KEC wants to put an industrial emitter at this particular location. For purpose of your DEP analysis you're using a class-C industrial emitter?

THE WITNESS (Gresock): That's -- that's correct. DEP -- DEEP's rules are also land-use driven.

MR. BASHAW: And you mention, I believe, in your update that the Town of Killingly noise level standards, in their ordinance are consistent with what the DEP has with the exception of the definition of daytime. It varies?

THE WITNESS (Gresock): They're generally consistent, yes.

MR. BASHAW: Do you have a copy of the Killingly code of ordinance in front of you for noise?

THE WITNESS (Gresock): We do.

MR. BASHAW: If you could direct your attention to that for a moment?

Now we've already discussed that under the DEP regulations, the DEP looks at the emitter of the noise and that's in the left-hand side of your column, table two in Exhibit L. Do you see that?

THE WITNESS (Fowler): Are you talking about the far left column?

MR. BASHAW: Yes, I am. Okay. Now if you look at section -- there is a similar table in the Killingly ordinance. This is where I'm going to direct your attention to now. It's in section 12.5-125. Do you see that table?

THE WITNESS (Gresock): Yes.

MR. BASHAW: Okay. That same column, that same column that we're talking to -- talking about is titled in the Killingly zoning ordinance as the zone, the zone in which the emitter is located. Do you see that?

THE WITNESS (Gresock): And it's

followed by language that states, where multiple uses exist within a given zone district the least restrictive land-use category for the emitter and receptor shall apply regarding the noise standards specified.

MR. BASHAW: Okay. And what is the land use, to the extent that you know -- let me ask -- let me strike that.

You are aware. Correct? That the KEC facility, the proposed location is in a rural development zone?

THE WITNESS (Gresock): We understand the existing zoning, yes.

MR. BASHAW: Okay. And you also understand that that is a subcategory of a residential zone?

THE WITNESS (Gresock): We also understand that the use that is proposed is an industrial use.

MR. BASHAW: Yes, but that doesn't answer my question. The question was, are you aware that the rural development zone is a subcategory of a residential zone?

THE WITNESS (Gresock): It would fall within that category, yes.

MR. BASHAW: Okay. Thank you.
THE CHAIRMAN: I just have a followup. I understand the zoning, but I just wanted to clarify the plan of conservation and development, does that also have the entire parcel in residential?
MR. BASHAW: I believe it does.
THE WITNESS (Gresock): It's designated for -- for future industrial use, but it's not currently industrially zoned.
THE CHAIRMAN: I'm not sure that clears it up, but anyway.
MR. BASHAW: So again, I think we can agree based upon prior testimony in this discussion that even after the KEC facility is constructed, it is going to be located in what is classified in the Town of Killingly as a residential zone?
THE WITNESS (Gresock): That is correct. We state that in the application.
MR. BASHAW: And again, the receptors now, and I'm going to talk about the abutting properties for the time being, are also going to be in residential zones. Correct?
THE WITNESS (Gresock): Yes, and we

have treated them that way.

MR. BASHAW: All right. Now that being the case, under the Killingly zoning ordinance the zone in which the emitter is located we have agreed is residential, and the receptors we have agreed are residential?

THE WITNESS (Gresock): The zone in which the emitter will be located will be industrial if it is approved to be in that location.

MR. BASHAW: If it is approved?

THE WITNESS (Gresock): And that -- and that is the scenario we're evaluating.

MR. BASHAW: Well, unfortunately what the zoning -- my question is this, as the zoning exists today and as the zoning will exist on the date the KEC facility is constructed, it will be a residential zone?

THE WITNESS (Gresock): The Siting Council's approval, should they do so of the project, although not a formal zoning action is in lieu of zoning. And if this site is approved as appropriate for this use it will be as an improved industrial use.

MR. BASHAW: But under the Town of

Killingly zoning ordinance the question simply is, it will remain a residential zone?

THE WITNESS (Gresock): And under the Killingly ordinance there's a specific provision for cases where multiple uses exist within a given zone district as per the language I've read to you.

MR. BASHAW: For the sake of my continued -- my question simply is this, then for a zone in which an emitter is located -- if an emitter is located in a residential zone, and I understand you perhaps disagree with me as to what the categorization of KEC will be, but for the sake of my question, it's simple.

If an emitter is located in a residential zone, then the decibel level for a residential daytime receptor is 55 decibels. Correct?

THE WITNESS (Gresock): If a residential use in a residential zone is being compared, that would be 55 during the day and 45 at night, yes.

MR. BASHAW: Actually, that wasn't my question. You had said, if a residential use in a residential zone. I'm simply asking just

looking at this chart -- that's all I'm asking you to do.

THE WITNESS (Gresock): On the chart?

MR. BASHAW: On the Town of Killingly --

THE WITNESS (Gresock): That chart is clarified by the language under the chart, which specifies that there is a distinction between zoning and the possibility of land uses that are in the area. Yes, the -- the chart says 55 and 45.

MR. BASHAW: Okay. We'll go back and see if you recall back to November 15th we were also beginning to talk a little bit about background noise sampling points that you collected. Do you recall that?

THE WITNESS (Fowler): Uh-huh, yes.

MR. BASHAW: And just about to bring us all up to speed, you selected five discrete short-term sampling points. Correct?

THE WITNESS (Fowler): Correct, with one longterm.

MR. BASHAW: And one longterm. Yeah, thank you. Okay. Your updated memo of

October 27, 2016, had a revised exhibit or figure 7-5. Do you recall that?

THE WITNESS (Fowler): Yes.

MR. BASHAW: And on that revised exhibit it identifies the locations of the five discrete sampling points as orange boxes. Is that correct?

THE WITNESS (Fowler): Correct.

MR. BASHAW: And based upon just looking at this diagram, am I correct in noting that ST-3, ST-5 and perhaps ST-1 are actually not located on the property boundary of the KEC facility?

THE WITNESS (Fowler): That's correct.

MR. BASHAW: So these sampling points are located some distance away from the boundary?

THE WITNESS (Fowler): They are, but they're not compliance points.

MR. BASHAW: But yet your study compares the data from the sampling points to the DEP regulations and to the Killingly zoning ordinance. Correct?

THE WITNESS (Gresock): And it also

provides the contour that demonstrates compliance with the 51 dB.

MR. BASHAW: All right. Let's talk a little bit about the model, acoustic model that you used. Bear with me. The model that you used complies with, according to your report, an ISO standard that's identified as 9613-2. Correct?

THE WITNESS (Fowler): Correct.

MR. BASHAW: Are you aware of what the confidence limit is for models for this, for this standard where it meets all assumptions and conditions?

THE WITNESS (Fowler): The confidence level?

MR. BASHAW: The accuracy of the model?

THE WITNESS (Fowler): Typically it's plus or minus 2 dB.

MR. BASHAW: Well, your report doesn't provide any sort of confidence limits to your model. Does it -- to your results? I'm sorry.

THE WITNESS (Gresock): The report is a commitment that NTE is making to those sound levels that will be required to be confirmed by

their EPC contractor, although there's some variability. They are also -- it's what the vendor specifications are that are utilized for the modeling, a little bit of margin built into that as well acknowledging that that's the case.

MR. BASHAW: But the data that you report in here for both your background sample results and for your model sample results have, based upon your testimony here, an accuracy of plus or minus 2 decibels?

THE WITNESS (Fowler): The background level would be plus or minus 1 dB based on the instrument that we used. That's not modeled. That was actually measured.

MR. BASHAW: But for the modeling itself, that still has a standard of deviation, if you will -- and again, I'm not a statistician, so I may not be using the right term, but it is a potential margin of error plus or minus 2 decibels based upon the ISO 9613-2 methodology?

THE WITNESS (Fowler): Correct.

MR. BASHAW: The data that's inputted into the model I think is somewhat identified by bullet points. It's section 5.1 of Exhibit L. I should phrase that as a question,

which would be, is that correct?

MR. BALDWIN: Do you have a page number for that, John?

MR. BASHAW: Sure. It's page 18.

THE WITNESS (Gresock): You're asking about the -- the model of assumptions and not the source data?

MR. BASHAW: Yes, correct.

THE WITNESS (Fowler): Yeah, that's correct.

MR. BASHAW: And some of these data points that you're inputting are things that you have to make a qualitative assessment. Correct?

THE WITNESS (Gresock): Qualitative or location specific.

MR. BASHAW: So in assessing for example, I mean, in identifying the effects of terrain features including relative elevations of noise sources, how does one input terrain features into the model?

THE WITNESS (Fowler): We have GIS topography data that is input into the model.

MR. BASHAW: Okay. And source directivity factors. What is that?

THE WITNESS (Fowler): It's the --

how the sound emit -- emits the, or how the source emits the sound. And in this case we assumed everything is omnidirectional.

MR. BASHAW: Okay. So I guess my point is, in doing a modeling there's some nonobjective data that goes into the modeling that's based upon your best guess, or your best estimate?

THE WITNESS (Gresock): The modeling involves the creation of a three-dimensional layout of the facility that incorporates the surrounding terrain, that incorporates the base elevation of the proposal, the way the buildings and structures are oriented on the site. And -- and there are some conservative assumptions that are applied.

As Kevin mentions, probably not all of the sources are omnidirectional, but assumptions like that are incorporated in order to acknowledge the -- the plus or minus nature and to build in some certainty in terms of compliance.

MR. BASHAW: And changes in some of that qualitative data could affect -- could affect the results of the modeling. Correct?

THE WITNESS (Gresock): There are

varying sensitivities.

THE WITNESS (Fowler): Yes.

MR. BASHAW: Now before you did the modeling you did obtain some baseline, what I'm calling baseline sound measurements. And we talked about the five discrete sampling points and the one long-term point. Correct?

THE WITNESS (Fowler): Correct.

MR. BASHAW: And that data is set forth on page 14 of Exhibit L, in table 6. Is that correct?

THE WITNESS (Fowler): Correct.

THE WITNESS (Gresock): The LEQ values are -- are identified there. And in the application itself we have presented the L-90 values which were also collected at the -- at the same time.

MR. BASHAW: In the data, for example, you have an LEQ data point for ST-1, daytime 47. I'm just using that as the first reference point. Is that number an average of the sound that was recorded over -- I believe that the short-term sampling points were about 30 minutes. Correct?

THE WITNESS (Fowler): Correct.

Yeah.

MR. BASHAW: All right. So is that number an average of what was recorded over that time period?

THE WITNESS (Fowler): Correct, yes.

MR. BASHAW: So there could have been points during that time period in which you could have had a discrete sound level that was in excess of 47?

THE WITNESS (Fowler): That could be, but typically LEQ values are measured over an average. We don't look at instantaneous periods of time.

MR. BASHAW: But the whole nature of an average is you may have some numbers higher and some numbers lower?

THE WITNESS (Fowler): Correct?

THE WITNESS (Gresock): And that would be why the L-90, which was presented in the application, is what is used in order to determine whether a location is considered to be a high noise environment, which would drive what the metrics are that are used for compliance assessment.

MR. BASHAW: But that's not what you used in your report, though?

THE WITNESS (Gresock): It's not what was presented in this report, but that was used.

MR. BASHAW: So neither of these reports are utilizing the L-90 values?

THE WITNESS (Gresock): The L-90 value and the LEQ value are not utilized in any event relative to the compliance demonstration, because both the state and the local ordinances are a project specific value, not a comparison to ambient conditions.

The ambient is provided for information, but the ambient is also provided in order to confirm that the project should utilize the values that are presented in the tables, versus being designated as an area of high noise that would require a different standard to be applied.

MR. BASHAW: So the background that you've done is used, if I can -- you tell me whether I'm stating it accurately -- is used as a means of reference or comparison to your model results?

THE WITNESS (Gresock): It is. It's -- it's frequently helpful to present that information.

MR. BASHAW: Again, correct me if I'm misstating this. So it's a means by which one can look at your modeling data and see what the numbers are and then you can compare it to what you've done for background to see whether it's better, whether it's worse than what you have for background?

THE WITNESS (Gresock): It's not a compliance metric, but it's -- it provides some context.

MR. BASHAW: Okay.

In table 8 on page 19 of Exhibit L -- and we need to use this table. I do know that you also have included that, a similar table in your October 27th report. I don't know if there's a -- I didn't go through it line by line to see if there's a substantive difference between the two. I can use either table.

THE WITNESS (Gresock): Yeah, it's table two in that reference. And we might want to look at that one since it's the most recent assessment.

MR. BASHAW: Yeah, that's perfectly fine. Now just so I can understand this table, you're showing in this table that there are certain pieces of equipment that will be used at the KEC facility that are going to emit broadband noise levels from 73 -- I may not have the range actually, you know, 73 to approximately 118 decibels.

THE WITNESS (Fowler): It's the sound power.

MR. BASHAW: The sound power. And so what does that mean?

THE WITNESS (Fowler): It's the power produced by the source, and it radiates off of it. It's not comparable to background noise levels, because background noise levels will be a sound pressure level. You're actually measuring the pressure of the -- of the air.

MR. BASHAW: So if I were to put a measuring device measuring sound pressure level right next to a source that has a power of 118 decibels, would I not see a pressure reading somewhat equivalent, equivalent to 118 decibels?

THE WITNESS (Fowler): No, it wouldn't.

MR. BASHAW: What would I?

THE WITNESS (Fowler): I mean, it depends on the distance and depends on the actual source and how it's emitting the sound off, but it's usually about 10 to 15 decibels quieter -- or lower than the sound power level.

THE CHAIRMAN: Is that at the property line?

THE WITNESS (Fowler): It would be just some distance off, maybe like five feet. That wouldn't be at the property line. It would be just like a 3-feet measurement from the source.

MR. BASHAW: So in your modeling are you using the sound pressure data for these devices, or are you using --

THE WITNESS (Fowler): The model inputs sound power levels --

MR. BALDWIN: Kevin, hold on.

MR. BASHAW: Let me clarify the question. For the input to the model for these devices are you using sound power or pressure?

THE WITNESS (Fowler): The model input we use is sound power. And the model calculates out the sound pressure to the property lines.

MR. BASHAW: Okay. But in general, for just in general, from what you've said if you look at these numbers, pressure in direct proximity, if you will, of the emitting source will be 10 to 15 decibels less than the power, the broadband dBA?

THE WITNESS (Fowler): Generally speaking, but it depends on the direction and -- and the type of source it is.

MR. BASHAW: Okay. But that's a good rule of thumb?

THE WITNESS (Fowler): Uh-huh, yeah. At, like, a distance of 3 feet.

MR. BASHAW: And are these numbers in table 2 with or without silencing devices?

THE WITNESS (Fowler): It is, correct.

THE CHAIRMAN: Correct? Which?

THE WITNESS (Gresock): It does reflect the mitigation measures that are specified.

MR. BASHAW: So these numbers in table two reflect the mitigating measures. So this is after the application of mitigating.

If you look at page 4 of your

October 27 supplement? And for purposes of these questions I'll also ask you to take a look at table 1 on page 5, of Exhibit L, which is your typical noise sources and acoustic environments.

And I'm just going to point out -- I'm not going to go through every single line on here, but these readings that you have here are actually sound pressure levels. Do you see that? For example, in bullet number two, turbine exhaust diffuser. You say it's equivalent to a sound pressure level of 88 decibels at 3 feet?

THE WITNESS (Fowler): Correct.

MR. BASHAW: So we have 88 decibels of sound pressure coming from the turbine exhaust diffuser. And if you look at your table one in Exhibit L, that's in the significant subjective impression category. Correct?

THE WITNESS (Gresock): That's right.

THE WITNESS (Fowler): And that's also at 3 feet from the source.

MR. BASHAW: I understand, but that source is going to be emitting a noise with a sound pressure level that you acknowledge is significant?

THE WITNESS (Gresock): There are many loud elements, which is part of why the layout and the design was developed that way.

MR. BASHAW: So then I don't have to go through the list. We will agree that there are many sources of noise that this facility will produce that will be significant, not necessarily at the property line, but will be significant at the point?

THE WITNESS (Gresock): At their source, yes.

MR. BASHAW: If you could now look at -- I'm going to have you look at two things, your October 27, 2016 report, your final modeling numbers, the table of the numbers, which is at page 5. And I would also like to have you look at your background measurements, section 3.3, table 6, in your Exhibit L.

Now if you look at ST-1 in the background table, your measurements were 47 decibels for day and for night. Do you see that?

THE WITNESS (Fowler): Uh-huh.

MR. BASHAW: And we just discussed all of the significant noise sources that are

going to be emitting from the KEC facility. Do you recall that?

THE WITNESS (Fowler): Yes.

MR. BASHAW: Yet your model shows what for a sound level at ST-1?

THE WITNESS (Gresock): Forty-four.

MR. BASHAW: It's going to reduce the sound?

THE WITNESS (Gresock): No that's the project's sound level. That's not the project sound level plus ambient. The -- the requirement in both the state and local ordinance is restricting -- restricting the emitted sound from a specific source.

MR. BASHAW: So again, you're going to have to explain to me what your acoustic modeling actually shows?

THE WITNESS (Fowler): The model shows the actual -- the projected noise levels from the KEC property only. It doesn't take into account existing background noise.

MR. BASHAW: So this will be additive to the background?

THE WITNESS (Fowler):

Logarithmic -- Logarithmically,

yes.

MR. BASHAW: So if I -- this is your opportunity to educate me. If I take ST-1 at 47 for background, am I adding 44 which is coming from the facility now to that?

THE WITNESS (Fowler): No. No, it's a logarithmic addition. So the increase, or the change in noise level would be less than 3 dB during -- for a logarithmic addition.

MR. BASHAW: But that's not reflected in any of these reports. This, I understand the --

THE WITNESS (Gresock): Because the compliance metric is for the facility alone, and because the ambient measurements were provided purely as a contextual tool we did not provide that information.

MR. BASHAW: So what we don't have is the actual noise level that is going to be at the property boundaries after this facility is constructed, both from the facility and from the existing noise that might be present?

THE WITNESS (Gresock): That's -- that's not presented because the only sound level NTE can control is the sound coming from its

project. The ambient background will vary over time depending upon whatever loud sources happen to be occurring in the area.

MR. BASHAW: I understand that, but all I'm saying is that the report does not provide information as to what actual model plus background sound level will be based upon existing levels at these property levels -- these property lines?

THE WITNESS (Gresock): That's correct. The report provides compliance only.

MR. BASHAW: So all that your report does is show just from this facility this is what we're going to have for noise levels?

THE WITNESS (Gresock): As is required by state and local standards, yes.

THE CHAIRMAN: Excuse me. The noise that would be provided by the facility is constant pretty much throughout the day? It's not like ambient which will vary? Or is that just a maximum?

THE WITNESS (Gresock): When all of the -- it's the maximum when all of the equipment is running steady state, yeah.

THE CHAIRMAN: Thank you.

MR. BASHAW: Okay. I'm going to shift direction into visibility at this point, so I don't know who the proper person would be to address those questions. I don't know who I'm directing my question -- oh, you, very good. Lucky you.

All right. This is appendix K to the application, the visual impact assessment prepared by Tetra Tech.

I've never addressed you, but it is --

THE WITNESS (Gresock): Gresock.

MR. BASHAW: Gresock. Thank you. Sorry. Ms. Gresock, you testified on November 3rd. I'm not going to ask you to recollect everything you said, but so you can correct me here -- but during your testimony on November 3rd you acknowledge that with respect to visibility, the density of the tree coverage on the KEC facility will provide adequate visibility protection in a leaf-off condition. Do you recall that?

THE WITNESS (Gresock): I don't recall that specifically, but it's a tree -- it's the tree density, not on the site per se, but

certainly a lot of tree density in the surrounding area.

MR. BASHAW: All right. So essentially what you're saying is the number of trees themselves, the trunks and the stems of the trees will provide adequate visibility protection, if you will, in a leaf-off condition?

THE WITNESS (Gresock): The photographs that we took were during leaf-off conditions so that we could simulate under those conditions. And it's difficult to find locations where direct views are possible. It doesn't mean that there won't be some areas where there are views.

MR. BASHAW: Is a fair statement that Exhibit K really focuses on the visibility of the 150-foot stack?

THE WITNESS (Gresock): The 150-foot stack is the tallest element, but all of -- all of the project structures were considered.

MR. BASHAW: But the analysis that's in the report, does it include analysis, if you will, of looking through these trees, if you will, to other structures that KEC will have

constructed on the site?

THE WITNESS (Gresock): To the extent they would have been visible from those locations they would have been shallow. Now that, that said --

MR. BASHAW: Well, let me ask the question here. On page 70 of the application, and you can go there if you want, but I'm just simply going to say, if you are aware that NTE is going to be removing vegetation on about 24 acres of land?

THE WITNESS (Gresock): Yes, and -- and I was going to say, that said, we could not simulate the clearing that will occur on the site.

There will be retained, in most locations, a fringe of trees. And for that reason and the viability assessment there are statements that reflect that locations that are approximate to the site may have some more direct views down the site driveway, for example.

MR. BASHAW: So this density of tree issue, once you remove 24 acres worth of trees -- is not necessarily going to provide as much visual buffer in a leaf-off condition as it does now?

THE WITNESS (Gresock): Visual screening will still occur at that -- at the close locations. And the clearing on the site will not affect this considerable screening that will occur even under leaf-off conditions due to the surrounding tree cover.

MR. BASHAW: I don't know. I have a copy of this just to make it easy, but what I'm going to show you is the revised site plan which is Exhibit 2, to the submittal, I think, to the restrict -- do you need this. You want me to give it to you?

MR. RAY: The right to restrict?

MR. BASHAW: Yeah, just to make it easier.

THE CHAIRMAN: Do you have an extra?

MR. BASHAW: No.

Oh, I have an extra. I'm sorry.

MS. MILLER: We do have an extra.

MR. BASHAW: Looking at this exhibit there is no -- oh yes, there is a north arrow. Okay. There's a north arrow way up in the far left corner of the map. If you look at kind of the southern boundary where it has a series of

elevation numbers, it's actually the line that's at the very bottom of the drawing. Do you see that?

THE WITNESS (Gresock): Along Lake Road.

MR. BASHAW: Not along Lake Road. It's kind of more to the southwest.

THE WITNESS (Gresock): Okay.

MR. BASHAW: It's adjacent to where the oil tank -- the boundary that's adjacent to the oil tank. Do you see that?

THE WITNESS (Gresock): Yes.

MR. BASHAW: The property that's on the other side of that, would you agree with me that that is the Wyndham Land Trust property?

THE WITNESS (Gresock): There is an access way along that border.

MR. BASHAW: And based upon this site plan and I didn't -- there's a scale on here and I didn't bring a ruler with me, but would you agree that there will be some structures on the KEC facility that will be as close as, I don't know. I'll just say 80 feet to that, to that border?

THE WITNESS (Gresock): I don't

have the scale with me either, but it will be as is, as is shown on that drawing.

MR. BASHAW: But there is a scale there and one could take a ruler, and I'll just go for the sake of argument. If one were to take a ruler and to measure to what -- I don't know what it is. Items 21 and 20 on the map -- I'm sorry, on the site plan, you're 60 to 80 feet to that border? I'm not looking for an exact number.

THE WITNESS (Gresock): Something on that order looks -- looks correct.

MR. BASHAW: And obviously, you're not going to have trees that are going to go right up to these particular structures as identified on the map. Correct?

THE WITNESS (Gresock): That's right.

MR. BASHAW: And in fact, around the oil tank in particular you're going to need some area for secondary containment. Yes?

THE WITNESS (Gresock): The area for secondary containment is shown around the oil tank. And there will be a fringe of trees that will remain around the perimeter of the property in that location.

MR. BASHAW: A fringe of trees?
THE WITNESS (Gresock): Correct.
MR. BASHAW: About how wide?
THE WITNESS (Mirabito): I'm sorry. Could you repeat the question?
MR. BASHAW: Sure. About how wide is this fringe of trees on the border with the Wyndham Land Trust that we're talking about?
THE WITNESS (Mirabito): Our intent is to make it up to 50 feet wide wherever possible on the perimeter of the site.
MR. BASHAW: In the visibility analysis on page 18 -- I call it a visibility analysis. It's formally called a visual impact assessment. Could you look at -- and it's actually figure 9, and there is a graphic.
I don't know how you want to describe it, but there is a depiction, if you will. You see the Dunne Preserve KOP? Do you see that in the upper left-hand column of figure 9?
THE WITNESS (Gresock): The line of sight drawings?
MR. BASHAW: Yes.
THE WITNESS (Gresock): Yes.
MR. BASHAW: Thank you. Okay. And

this one is -- the one I'm looking at says, Dunne Preserve KOP. What is that?

THE WITNESS (Gresock): Are you asking what the graphic is?

MR. BASHAW: No, I'm asking the title. What is meant by the title, Dunne Preserve. Is that a location that was going to be considered, from the Dunne preserve?

THE WITNESS (Gresock): Well, as -- as noted on page 18, the Dunne Preserve is the property owned by the Wyndham Land Trust.

MR. BASHAW: Yes. I'm sorry. And so this line of sight drawing reflects a depiction from the Dunne Preserve, from a point on the Dunne Preserve?

THE WITNESS (Gresock): The line of sight drawings do provide one means of understanding what a view might be from those locations. These were locations that we felt were important enough to present, but did not feel that a visual simulation using photographs would be meaningful given exactly the issues you're describing relative to site clearing.

MR. BASHAW: So this, this point was not chosen for your analysis?

THE WITNESS (Gresock): This point was chosen and presented in this way, but it was not selected as a photographic simulation.

MR. BASHAW: Okay. This diagram shows -- the green box on here is the -- depicts what?

THE WITNESS (Gresock): That's presumed vegetation height.

MR. BASHAW: From the sample point on the Dunne Preserve to where?

THE WITNESS (Gresock): I'm not sure what you're asking.

MR. BASHAW: Let's start with it says, observer. Do you see that in the lower portion of that site diagram?

THE WITNESS (Gresock): Uh-huh.

MR. BASHAW: Okay. What does that depict?

THE WITNESS (Gresock): So that reflects a person standing in that location.

MR. BASHAW: And that location would be on the Dunne Preserve?

THE WITNESS (Gresock): And that location would be on the Dunne Preserve, yes.

MR. BASHAW: On the border with the

KEC facility?

THE WITNESS (Gresock): I would have to look at the maps to see the specific location, but there are graphics in the report that reflect the approximate location.

MR. BASHAW: This indicates a vegetation area that extends approximately 200 feet from the observer. Is that what that depicts?

THE WITNESS (Gresock): More important than the extent is -- is the height. A line of sight from a viewer to a structure in the distance is influenced by the nearer vegetation almost -- almost more than by vegetation that's further away due to the way that line of sight could be blocked by approximate vegetation.

MR. BASHAW: But getting back to my question, this green box, accepting what you just said, and I'll get to that in a second, if you look at it horizontally it's showing a vegetation that goes out 200 feet?

THE WITNESS (Gresock): It does, yes.

MR. BASHAW: Okay. And as we just discussed on the border with the Wyndham Land

Trust, Dunne Preserve, you're going to have after construction at best a 50-foot buffer?

THE WITNESS (Gresock): This, this view is intended to reflect the preserve itself and not necessarily the access way.

MR. BASHAW: So okay. So you therefore didn't select for your analysis a point on the Dunne Preserve that was going to be all of 50 feet worth of vegetation buffer between it and the KEC facility?

THE WITNESS (Gresock): Trees in that location would have a similar line of sight filtering function, but in selecting the locations to specifically present we wanted to have them be meaningful, and to have done a photographic simulation would have the same limitations as would be reflected from this location.

MR. BASHAW: So I'm going to get to your point before, also, about it being more important than the height of the trees closest to the observer. When we first talked about this, that's probably more important than the horizontal extent of the vegetation?

THE WITNESS (Gresock): And not necessarily the height. Trees don't need to be

very tall to block line of sight given the height of most persons.

MR. BASHAW: Because in this diagram, this line of sight diagram, it shows the height of trees to be 300 and -- 320 feet. Do you see that?

THE WITNESS (Gresock): Right. Right. I mean, that's above mean sea level not -- not tree height.

MR. BASHAW: That's measured from the observer. Okay. Well, we'll just do it relative to the observer. The observer is what? Six feet tall.

THE WITNESS (Gresock): So relative to the observer at -- at no matter what -- what the angle, would be the trees would block the view.

MR. BASHAW: But relative to the observer on this diagram that you provide --

THE WITNESS (Gresock): I'm sorry. I couldn't hear that question.

MR. BASHAW: I didn't finish it because you were being -- discussing. Relative to the observer this diagram shows trees that are over --

THE WITNESS (Gresock): Our -- our tree assumption is on page 17. It's, say, 60, 60-foot --

MR. BASHAW: I'm going to strike the question. I see where you're not starting at a zero-point of vegetation. The height of the vegetation. That's fine. So I don't need to ask that anymore.

But as far as the -- I guess my point being, or my question was, in choosing whether or not to take a sample point on the Dunne Preserve, you relied upon this line of sight diagram. Correct?

THE WITNESS (Gresock): We utilized this line of sight drawing because we felt it was an important place from which some indication of visibility needed to be expressed and we did not feel that a photographic simulation would do that effectively.

MR. BASHAW: And in actuality there will be points along the Dunne Preserve boundary line, the KEC where the vegetation buffer will be at most 50 feet?

THE WITNESS (Gresock): That's correct.

THE WITNESS (Mirabito): And I just add, but only along the access road to the Dunne Preserve itself. That as -- as part of our project there's actually upwards of 20 acres. There's upwards of 20 acres at the back of the property that we're going to be putting into a permanent conservation easement.

So that's 20 acres between our project and the primary Dunne Preserve itself. So in addition to what we're showing on this there's all the vegetation that's existing on the back of the property. So --

MR. BASHAW: No further questions on the visibility issue. Two other small, short issues to discuss. One has to do with the -- just to do about the interrogatory, NAPP interrogatory 28, which was a question regarding studies haven't been done with respect to radon.

The question was posed in the interrogatories as to what studies have been conducted to assure that radon gases entrapped in local bedrock will not be released into local residential drinking water wells and local homes. That was the interrogatory. And I'll give you a moment to pull that up so you can take a look at

the response.

MR. BALDWIN: What's the exhibit number, John?

MR. BASHAW: It's the NAPP. It's the -- I don't have the exhibit number. I'm sorry. It's the NTE responses to the NAPP interrogatories. It's dated October 20, 2016.

MR. BALDWIN: Thank you.

MR. BASHAW: And with respect to the response that was provided, which was essentially that given that the proposed blasting activities are a considerable distance from the nearest residence, it's unlikely that the blasting activities will result in increased radon levels.

And have any studies been performed by NTE to support that assumption?

THE WITNESS (Rega): There have -- there have been no studies conducted on the -- the specific studies on the effect of blasting on radon. What we do know is that blasting, you know, takes place sort of near the surface and far from, you know, where the aquifers are. So we don't expect any impact on radon levels in the water.

MR. BASHAW: Okay. But again, you

don't have any studies one way or the other to support that?

THE WITNESS (Rega): That's right.

MR. BASHAW: I believe I heard testimony or saw something in the application that referred to a pre-blast survey being conducted on structures within 250 feet of the -- is it 250 feet? Well first of all, am I correct in that assumption?

THE WITNESS (Rega): Yes, that sounds right.

MR. BASHAW: Okay. And is that 250 feet of the property line?

THE WITNESS (Rega): I believe the 250 feet was in reference to the location of the blasting.

MR. BASHAW: And I'm just curious as to, do you know how many wells and/or structures are going to be surveyed within that perimeter?

THE WITNESS (Rega): I do not know the number, but those surveys would certainly be offered to -- to any of the homeowners in that, in that area. Of course, it's up to the homeowners whether or not to accept those, those surveys, but

it's certainly something that we're willing to do, to do the pre-blast and the post-blast surveys.

MR. BASHAW: I just have a few questions on traffic.

Mr. --

THE WITNESS (Hesketh): Hesketh.

MR. BASHAW: Hesketh. Thank you. Mr. Hesketh, you are aware since you've done the traffic analysis that some of the traffic, so to speak, on Lake Road consists of horses and riders. Yes?

THE WITNESS (Hesketh): That's -- that's been brought to my attention, yes. We did not observe any during our studies, but there are farms in the area. So I expect that there are some people who ride horses in that area. That's correct.

MR. BASHAW: And so since that was brought to your attention during these hearings -- is that how it came to your attention?

THE WITNESS (Hesketh): I believe during the interrogatory process, if that's the correct terminology.

MR. BASHAW: So your traffic analysis does not take into account in any way how

traffic associated with the construction or operation of the KEC facility might impact equestrian riders on Lake Road?

THE WITNESS (Hesketh): Well, we have conducted a traffic study for capacity and -- of the roadway. We have looked at operations of intersections. We have made recommendations on improvements to Lake Road from our site driveway toward -- to the east, to widen that roadway to provide additional pavement, which would provide an additional area for pedestrians or equestrians to utilize that roadway.

So we believe that at least in that area where we're making improvements that the -- it will be a safer environment for those types of roadway users.

MR. BASHAW: But again, you've done no analysis of what these improvements will do with respect to noise, large trucks, large vehicles associated with the KEC facility, and how that might impact people who might be riding horses on Lake Road?

MR. BALDWIN: Noise? I'm not sure if that's the right guy for noise.

MR. BASHAW: The noise of the

vehicle, whether or not the sound of the vehicle, or the size of the vehicles, how it might affect. The question is very simple. You've done no analysis of it. Correct?

THE WITNESS (Hesketh): We have done no studies on the impact specifically of -- of horses on Lake Road. That's right.

MR. BASHAW: And so you've made no determination about how much the road is utilized by persons with their horses and riding on that, on that road.

THE WITNESS (Hesketh): I have not done any counts of equestrian activity on that roadway. That's correct.

MR. BASHAW: I have no further questions.

And I should clarify. My question was both for NAPP and for Wyndham Land Trust. Let me make it clear I'm not going to come back for Wyndham Land Trust.

THE CHAIRMAN: Attorney Looney, Connecticut Fund for the Environment.

MR. LOONEY: Good afternoon. John Looney for Connecticut Fund for the Environment. My cross-examination will make reference to

previous day's testimony. Does the applicant have the transcripts available?

MR. BALDWIN: Which day are we talking about?

MR. LOONEY: We're talking about the 3rd of November, the 15th of November and the 15th of December.

Well, while you're looking for this my first set of questions concerns water usage and they're directed to Mr. Mirabito.

Mr. Mirabito, as I understand it in your application it's estimated that when using or firing natural gas, on the order of 50,000 gallons per day is needed in the winter when the ambient temperature is below 59 degrees Fahrenheit. Is that correct?

THE WITNESS (Mirabito): Yeah, that's correct. That's a round number that we've been using and there's a water balance in the application that has more specific numbers.

MR. LOONEY: And in the summertime when the ambient temperature is greater than 59 degrees Fahrenheit, up to a hundred thousand gallons per day. Correct?

THE WITNESS (Mirabito): Correct.

Up to a hundred thousand depending on where the temperature is between 59 degrees and some summertime temperature.

MR. LOONEY: Okay. And then NTE anticipates when it's firing USDL in instances when natural gas is not available you anticipate using up to 400,000 gallons per day. Is that correct?

THE WITNESS (Mirabito): That's correct on those rare instances.

MR. LOONEY: Okay. And since the application was filed in August of 2016 have those estimates changed at all?

THE WITNESS (Mirabito): I -- I don't believe they have. I'm looking at Chris, because he was the owner of the -- the water balance itself. Those water balances haven't changed on the record.

THE WITNESS (Rega): The water balance has not changed. As Mr. Mirabito mentioned earlier, the numbers we cite are round numbers and the water balances have more specific numbers in them.

MR. LOONEY: Now I'd like to refer you to the transcript of the November 3rd hearing

at page 192. And again, this is for Mr. Mirabito.

THE WITNESS (Mirabito): Mirabito.

MR. LOONEY: Sorry, sir.

THE WITNESS (Mirabito): No problem. That's how they say it in upstate New York.

MR. LOONEY: 192, and I'd like to refer you to beginning at line 21. And on line 21 Mr. Perrone from the Council staff asked you if NTE had any discussions with the water company regarding supplying the plant even under drought conditions. Do you recall that?

THE WITNESS (Mirabito): Yes, I recall that.

MR. LOONEY: Okay. And I'd like to refer you to your response beginning on line 24 where you had indicated that there had not been any discussions with the Connecticut Water Company on that as you put in a particular scenario. Is that correct?

THE WITNESS (Mirabito): Yes, that's correct. At that time we hadn't had those discussions.

MR. LOONEY: Okay. Now referring to the transcript of the November 15th hearing --

THE WITNESS (Mirabito): But -- but we did subsequently have those discussions with the Connecticut Water. And frankly, that was part of the adequacy analysis memo that we submitted just before the September 15th hearing. And they confirmed that that analysis does consider drought sections. That margin of safety analysis does consider drought conditions.

MR. LOONEY: We'll get to that. Okay. On the November 15th hearing at page 405. Do you have that?

THE WITNESS (Mirabito): Yes, I've got it.

MR. LOONEY: Okay. Page 405 beginning at line 11. Chairman Stein asked basically the same questions concerning what the Department of Health Services and Connecticut DEP said concerning the need for a more detailed water supply analysis to account for system demand and water company existing commitments. Do you see that?

THE WITNESS (Mirabito): I do. Yes.

MR. LOONEY: Okay. And he also asked on page 406 beginning at line 8, the

Chairman asked, and is that taking into consideration the possible impacts of an extended drought? Do you see that?

THE WITNESS (Mirabito): I do, yes.

MR. LOONEY: Okay. And your answer begins at line 11. And to paraphrase, you answered that the water company did such an analysis early on and that resulted in the planned connection of the Plainfield system with the Killingly system to provide the largest volume of water. Is that a fair representation of your testimony?

THE WITNESS (Mirabito): Yes.

MR. LOONEY: Okay. And continuing, in your answer, also at line 14, concerned that they did such a determination in that if you look at line 18, that that considered the drought conditions. Is that correct?

THE WITNESS (Mirabito): Yes, that's what they told me.

MR. LOONEY: I'd like to refer you now to NTE's Exhibit 28 which was submitted at the December 15th hearing. And that is a demand and margin of safety analysis for the Connecticut Water Crystal System prepared by the Connecticut

Water Company and dated December 14, 2016, and it is addressed to you.

THE WITNESS (Mirabito): And we're getting a copy.

MR. LOONEY: Now is that the analysis that you're referring to in your response to Commissioner Stein?

THE WITNESS (Mirabito): No, not directly. On my November 15th testimony that refers to just a verbal conversation I had with Connecticut Water about their initial studies that were done when we inquired about the source of supply this past spring.

This memo was prepared more specifically in response to the DPH's request for such an analysis. So this, I didn't have access to this at the -- at the time that I responded previously. It was simply based on my conversation with Connecticut Water.

MR. LOONEY: So your testimony is today that there was not a written analysis by the Connecticut Water Company that concerned supplying adequate water to the NTE facility should there be an extended drought situation?

THE WITNESS (Mirabito): Not -- not

at that time. They of course have provided their ability to serve letter this summer sometime in August, I believe. We've provided that as part of our application, which they subsequently told us considered drought conditions. And then this memo was prepared to verify that.

MR. LOONEY: So your testimony was based on oral communications with the water company then. Is that correct?

THE WITNESS (Mirabito): On November 15th, yes. Correct.

MR. LOONEY: Okay. So Exhibit 28, the December 14th analysis from the Connecticut Water Company, if you look at the third paragraph that analysis was then based on historic demand. Correct?

THE WITNESS (Mirabito): Certainly part of this analysis considers historic demand.

MR. LOONEY: Okay. And that by its nature does not specifically mention anything relative to drought conditions?

MR. BALDWIN: Mr. Chairman, I think the letter from the Connecticut Water Company speaks for itself. I'm not sure Mr. Mirabito can speak too directly to the details of this, of this

report -- unless you have some specific knowledge about it?

THE WITNESS (Mirabito): No, other than to just confirm what I testified back in November 15th, which is this safe yield analysis, or this margin of safety analysis, as it's called in this particular memo, considers drought conditions. That's what Connecticut Water has told us.

MR. LOONEY: So other than those oral communications there's nothing in writing that has been presented as an exhibit before the Council that specifically states that the water company's analysis indicates that it can provide these amounts of water even under continuing drought situations?

THE WITNESS (Mirabito): I don't believe this memo -- doesn't appear has specifically the word "drought" in it. But again, I'd point to the margin of safety calculations that are both in the existing and projected scenarios. And there is -- there is, I would say, significant margin of safety shown under the various scenario study.

MR. LOONEY: My next series of

questions are addressed to Mr. Rega. I don't know if I pronounced that right.

Mr. Rega, I'd like to refer you to the transcript testimony from the November 3rd hearing, and particularly beginning on page 254 of that transcript. And I'll direct you to line 17.

At that point, in a response to a question from Councilmember Mr. Harder concerning the use of the graywater from Frito-Lay, you stated that there were two problems with using that source. Do you recall that?

THE WITNESS (Rega): Yes, I do.

MR. LOONEY: And at line 22 you state in response to Mr. Harder's question that one of the problems was that they have outages during the year, so it wasn't a reliable source of water. Do you see that?

THE WITNESS (Rega): Yes, I do.

MR. LOONEY: Okay. Can you explain what you mean by outages during the year?

THE WITNESS (Rega): The Frito-Lay facility, from what they have told us, shuts down their facility at certain times of the year to do maintenance on their facility. So at that time they don't produce the wastewater that they do the

rest of the year.

MR. LOONEY: So this is basically their operation?

THE WITNESS (Rega): Correct.

MR. LOONEY: My next series of questions concern the source of natural gas. Now sitting back there during several days of hearings I've heard people use, or referred to Yankee Gas as the owner of pipelines, but I'm going to use what's in the application, and that's Eversource.

So as I understand it, there is an existing distribution pipeline from the Algonquin Gas Transmission Company's mainline that goes down to Lake Road. Is that correct?

THE WITNESS (Mirabito): Yes, that's correct.

MR. LOONEY: And it's proper to say Eversource?

THE WITNESS (Mirabito): Yes, that's correct. Yankee Gas is the prior -- several prior iterations of the company.

MR. LOONEY: Okay. And the Algonquin mainline is approximately two miles northwest of the KEC facility. Is that correct?

THE WITNESS (Mirabito): Yes,

approximately.

MR. LOONEY: And that it's intended presently that the Algonquin mainline will be the source of natural gas that's used by the Killingly Energy Center. Is that correct?

THE WITNESS (Mirabito): Correct.

MR. LOONEY: And that the energy center will be serviced by an upgraded 2.8 mile pipeline lateral to be constructed by Eversource. Is that correct?

THE WITNESS (Mirabito): That's correct.

MR. LOONEY: And that it's NTE's proposal that the upgraded pipeline will be larger than or wider, if that's a right term, from what presently exists. Is that correct?

THE WITNESS (Mirabito): It will be a larger diameter pipe than what's there currently.

MR. LOONEY: And that the existing lateral pipeline was constructed over 50 years ago. Correct?

THE WITNESS (Mirabito): I believe that's the case, yes.

MR. LOONEY: And that the permits

for that construction of a new pipeline will be the responsibility of Eversource. Correct?

THE WITNESS (Mirabito): That's correct, yes.

MR. LOONEY: And would you agree with me that the environmental protection laws and regulations that exist now may differ widely from what was in existence 50 years ago?

THE WITNESS (Mirabito): I think that's probably correct, yes.

MR. LOONEY: Okay. My next questions concern responses to NTE's redacted responses to NAPP's interrogatories. And in particular, question 13 which appears on --

MR. BALDWIN: Sixteen?

MR. LOONEY: Question 13 that appears on page 8, and these responses are dated October 27, 2016.

MR. RAY: Response to number 13?

MR. BALDWIN: This is NTE Exhibit 16.

THE WITNESS (Mirabito): Okay. We're there.

MR. LOONEY: Okay. Question 13 asks or states, explain whether the NTE facility

will be able to operate as proposed in the Siting Council application if permits and approvals for the modifications to the proposed 2.8 mile natural gas pipeline are not approved. Did I read that correctly?

THE WITNESS (Mirabito): Yes.

MR. LOONEY: Okay. And the response from NTE is to operate as proposed in the Siting Council application. Permits and approvals for the 2.8 mile natural gas lateral will be required.

That it says, however there are potential or alternatives for delivery of natural gas to the KEC facility should permits and approvals for the proposed supply lateral routing not being attained. Do you see that?

THE WITNESS (Mirabito): I do. Yes.

MR. LOONEY: Okay. Can you describe to me what the alternative sources for natural gas are?

THE WITNESS (Mirabito): We -- we looked at several different lateral routing locations, so this could be an alternate route via Eversource. It could be an alternate route via

Algonquin. We chose the one we put in the application because we thought it was the most -- not most, the least impactful, because it was using an existing right-of-way of almost the entire length of the required lateral.

MR. LOONEY: So there is a potential the natural gas will be supplied through an alternative pipeline lateral?

THE WITNESS (Mirabito): An alternative lateral, not an alternative mainline. The gas will be sourced from the mainline. It's just how you get it from the mainline to our project.

MR. LOONEY: Can you point out for me where in the application those alternative pipelines are discussed?

THE WITNESS (Mirabito): It doesn't appear that we explicitly included any discussion of the alternate laterals.

MR. LOONEY: So if your application is approved, then the source of natural gas to operate the KEC facility might be for something that's not presently before the Siting Council. Is that correct?

THE WITNESS (Mirabito): Yeah.

Yes, that's correct, but that's why we answered the interrogatory the way we did.

MR. LOONEY: I have nothing further.

THE CHAIRMAN: Thank you.

MR. BALDWIN: Mr. Chairman, while we have our panel still here could I just have three quick questions on redirect?

THE CHAIRMAN: Yes.

MR. BALDWIN: Thank you.

Ms. Gresock, with respect to the Chairman's question I just wanted to get some clarification. Could you again restate in response to his question what the current Killingly plan for conservation and development designates for the KEC parcel as for future use?

THE WITNESS (Gresock): The future use in the plan is designating it as industrial use.

MR. BALDWIN: Thank you. Also with respect to the noise report, the updated noise report and the information contained in the record including your most recent testimony, is it your opinion and Mr. Fowler's opinion that the KEC facility will comply with all state or local noise

ordinances as it relates to the KEC operations?

THE WITNESS (Gresock): Yes.

THE WITNESS (Fowler): Yes, it is.

MR. BALDWIN: And the compliance, again in accordance with those ordinances will be noise levels at the property line. Is that correct?

THE WITNESS (Gresock): That's correct.

MR. BALDWIN: And Mr. Rega, with respect to the pre-blast survey questions to the extent property owners are concerned about radon in their homes or radon in their well, could a pre-blast survey include addressing those concerns with some pre-blast radon testing and some post-blast radon testing?

THE WITNESS (Rega): Yes, definitely.

MR. BALDWIN: That's it, Mr. Chairman.

THE CHAIRMAN: Do any of the parties -- we're going to go to break for lunch soon, but do any of the parties have any additional questions for the applicant at this time?

(No response.)

THE CHAIRMAN: Okay. Break for lunch now. We'll come back at 1:45.

(Whereupon a recess was taken from 12:40 p.m. to 1:48 p.m.)

THE CHAIRMAN: Good afternoon, ladies and gentlemen. I'd like to resume this hearing on application of Docket 470. We have Mr. Fagan who I guess is one of the representatives from the Sierra Club, if I'm not mistaken. And so we'll start cross-examination.

MR. BERMAN: Chairman Stein, if I may? Can we move the admission of his surrebuttal testimony which the Council mentioned this morning?

THE CHAIRMAN: Oh, you want to verify it.

MR. BERMAN: Yes.

ROBERT M. FAGAN,

recalled as a witness, having been previously sworn, was examined and testified on his oath as follows:

MR. BERMAN: So Mr. Fagan, do you

have a copy of the surrebuttal testimony of Robert Fagan, Synapse Energy Economics, in front of you?

THE WITNESS (Fagan): Yes.

MR. BERMAN: And was this testimony prepared by you or under your supervision?

THE WITNESS (Fagan): Yes, it was.

MR. BERMAN: And do you have any corrections to that testimony at this time?

THE WITNESS (Fagan): No, I do not.

MR. BERMAN: Is the testimony true and accurate to the best of your knowledge?

THE WITNESS (Fagan): Yes, it is.

MR. BERMAN: Council, I would move, respectfully move the admission of surrebuttal testimony of Robert Fagan Synapse Energy Economics as an exhibit in this proceeding.

THE CHAIRMAN: Any opposition to that?

(No response.)

THE CHAIRMAN: If not, it's admitted.

MR. BERMAN: Thank you. And Mr. Fagan is available for questions at this time.

THE CHAIRMAN: We'll start with the staff, Mr. Perrone.

MR. PERRONE: Thank you, Mr. Chairman. I just have a few short questions on the surrebuttal testimony. We'll start with the end of page 3 going into page 4.

At the end of page 3 it says, at a high level new renewable supply, a current surplus of capacity resources and declining net peak loads all mitigate against the potential economic retirement of 5600 megawatts. So just for clarity, Mr. Fagan, are you saying that a surplus of capacity resources and declining peak loads would make economic retirements more or less likely?

THE WITNESS (Fagan): No, that's essentially saying it mitigates against any perceived reliability effects that might otherwise be tied to the potential for retirement of any of that capacity.

MR. PERRONE: And also the very next line at the beginning of page 4 when it gets into ISO New England permitting the use of reliability must-run contracts. Is RMR still actively used in Connecticut, to your knowledge?

THE WITNESS (Fagan): It's still available to be used throughout New England. I

don't have -- I don't know exactly the extent to which RMR contracts currently exist in New England.

MR. PERRONE: And lastly, on page 7 -- no. Actually, the end of page 6, beginning of page 7. And the report notes that New England has about one half the peak load of the California ISO. Could you give us some rough numbers on that? ISO is X and California ISO is about two X?

THE WITNESS (Fagan): Sure. The peak load in the California ISO region of California is on the order of between 45 and 50 thousand megawatts. That's a summer peak load.

MR. PERRONE: And New England?

THE WITNESS (Fagan): New England, the peak load is on the order of 25,000 megawatts, or it was last year.

MR. PERRONE: Thank you. That's all I have.

THE CHAIRMAN: We'll now continue with cross-examination by the Council.

Senator Murphy?

MR. MURPHY: I have no questions of this witness at this time.

THE CHAIRMAN: Mr. Silvestri?
MR. SILVESTRI: I have no questions, Mr. Chairman.
THE CHAIRMAN: Mr. Hannon?
MR. HANNON: I have no questions at this time. Thank you.
THE CHAIRMAN: Mr. Harder?
MR. HARDER: No questions.
THE CHAIRMAN: Mr. Lynch?
MR. LYNCH: No questions.
THE CHAIRMAN: Mr. Chairman, yes, he has questions.
As I'm sure you know Connecticut is one of the highest-cost states in the country regarding electric rates. And I don't want to go into -- and there was discussion at the last hearing regarding the applicant's statement that if their facility was to go into operation it would lead to some reduction in rates. And I know there was -- and I don't want to go into that. I'm really asking a more general question of you, since your experience.
Without going into a dissertation, what does Connecticut need to do so our rates can get reduced?

THE WITNESS (Fagan): I'm sorry. I missed a little bit of that last sentence.

THE CHAIRMAN: What do we have to do here in Connecticut, and obviously how would it tie into this hearing that it would actually have a significant impact on our electric rates?

THE WITNESS (Fagan): The most important thing would be to increase the investment that Connecticut makes in energy efficiency resources. Energy efficiency resources are by far the least expensive. It's cheaper to save a kilowatt hour of energy than it is to produce and deliver one. That's pretty much number one just about in any state, or all states in the country, certainly including Connecticut.

Connecticut has a fairly strong energy efficiency construct, but not quite in the top five, for example. So I think continuing to increase the amount of energy efficiency that Connecticut strives to achieve would be -- certainly be the first thing.

You know, beyond -- beyond that certainly, you know, moving forward into a world where there's a lot more renewables helps to hedge against future gas price increases and, you know,

simultaneously the renewable costs are coming down so that helps a lot. But from a perspective of what's best for rate payers, what's best to lower bills in Connecticut, energy efficiency is just -- is at the top easily without a doubt. Everything else -- everything else sort of pales in comparison, frankly.

THE CHAIRMAN: Okay. Now I'm trying to get a sense of, not only where we are today and where we are in two or three years when if this project moves forward it gets approved, but where we are over the 20, next 20 or 30 years. Where, again if it's approved my understanding it would still be in operation.

And I'm not, I guess, none of us -- well, maybe some of us think we're prophets. But I'm just trying to get a sense of in the future, and I don't know really how to define that, but how much can we expect, for example, starting with efficiency and conservation? Do we have only, you know, if we put more political will and more money into the Connecticut programs will that -- what would that result in?

THE WITNESS (Fagan): Yeah. I mean, for comparative purposes, you know,

Connecticut, if I remember my numbers right, achieves on the order of about 1 and a half percent of its retail sales per year in energy efficiency savings. Massachusetts, Vermont, Rhode Island are in the high twos.

So very broad order of magnitude, you know, Connecticut could, you know, practically double its achievement of energy efficiency savings, you know, with the moving forward with -- with increased spending on energy efficiency programs.

Down the road, you know, over the long term, you know, the question is what's the best way to have energy policy that's least cost and aligned with what the New England state's, or Connecticut State's environmental goals are. So what does that look like? It looks like 80 percent reduction in greenhouse gases by 2015, which means a lot more renewables and as much efficiency as you could possibly procure.

So going forward it's -- it's continuing to keep track of what cost of renewable energy is and trying to buy the least cost forms of renewable energy first, but recognizing that you're going to need a lot of it, you know, over

the coming decades. And the costs associated with those resources will most likely continue the trend of declining costs, which is what they've shown recently, or are projected to show that moving forward.

I mean, it's a big question, you know, but essentially, you know, to move away from fossil fuels, the cheapest way to do is don't waste energy and buy the best price first on the renewable side of things. But recognizing that it's going to take more time for some of those costs, such as offshore wind, to come down.

THE CHAIRMAN: And I just wanted to go over more specifically, again how you see these particularly in this area moving forward. For example, solar. We've had a number of projects and continue to have projects coming to us, but most of them with maybe one exception are under 20 megawatts, you know, so they're not -- compared to a 550 and they do take up a lot of land and there are issues with farmland and forestland.

So I'm just -- I'm trying to see how much we can expect, again looking into the future with, well, starting with solar?

THE WITNESS (Fagan): Sure. Solar

PV is a distributed resource. It's a different animal. It's beauty is that's it's not concentrated. It is distributed everywhere. I don't have my fingertip -- tips on the, you know, the actual technical potential on rooftops in New England, for example. It's -- it's significant.

States do get to carve out policies about where you put the stuff. You don't necessarily put in on forest land. You put it up in parking lots. You put it along the interstates. You put it on rooftops, residential rooftops, commercial rooftops. It is a distributed resource. It is -- it's unlikely that you'll find 500-megawatt scale solar projects in New England.

It's not out of the question, but the economies of scale have to take into account, do you have land area for a 500-megawatt plant? Probably more importantly you don't necessarily need to do that to capture the -- the economies of scale kick in, in sort of the production and the installation stage of solar resources.

So you don't -- you don't have to have a 500-megawatt site in order to make solar work. Solar works at much smaller levels. It's a

distributed resource that has lots of benefit by being placed further downstream on -- on the system.

You know, New England already has, you know, on the order of a few thousand megawatts of installed solar altogether, if I've got my current numbers right. It's in my desktop somewhere. So by taking advantage of the distributed nature of the resource you're able to put three, four, five, six gigawatts on the New England system over a period of time as the policies play out in the individual states.

And if you need to be careful about making sure it doesn't go on farmland, if that's what the state's policy needs to be, the state can make that policy. It's not like the only place to put it is on farmland. There's a -- there's a lot of places where you can go.

THE CHAIRMAN: I just want to go down sort of through a list. I'm sure I think this Council knows better than anyone how difficult politically the route is, and I was just trying to figure out how many wind turbines we could get on this. And I think if it was a short one we could get on one based on the -- you could

get one based on that. But I'm unsure and I don't know if you have any sense, because there is, you know, there are concerns although they're somewhat different from solar.

THE WITNESS (Fagan): You could think about if you wanted to put a wind turbine or turbines on the site. I don't think that that's -- that that's not the right question.

THE CHAIRMAN: There may be no wind on this site in any case.

THE WITNESS (Fagan): Right. I mean, you know, the wind resources in New England are not best in Northeast Connecticut, you know. But because you can't put 500 megawatts of wind on a site such as what's proposed for this gas-fired plant, that that it's not that relevant.

What's relevant is that the wind -- the wind resource locations that are good in -- in New England, certainly in Northern New England. In Maine there's a lot of them, and it's certainly offshore. And then distributed around New England in different pockets there -- there are locations that are on a smaller scale.

What's -- what's important is that the economies of scale for wind would be you put

the wind somewhere else and you can deliver it to Connecticut. You can deliver it to the load across New England. The fact that New England has an integrated grid, it makes it sensible to put the wind where it makes the most sense, where the resource is good. And if you need to have more transmission to get it out of Maine, well, then you do the analysis to see how much more transmission you need and when you need that transmission, and you go from there. You know, and that's -- ISO New England and other parties are doing that.

I mean, there is a bit of a shortage in integrated planning in New England. ISO New England doesn't do integrated planning. Connecticut has an integrated resource planning process. I know it's not complete yet for 2016 and 2017, but an integrated resource planning process, you know, looks at all these details. It wouldn't assume that it's going to make sense to do wind in Northwest Connecticut, but it would make sense that it could be reasonable to do wind in Maine.

And probably do wind in Maine before you do the offshore wind, but at the same

time state policies can recognize that you sort of need to prime the pump. And that's what Massachusetts is doing by passing a law to get the 1600 megawatts of wind into Massachusetts over the next -- over the next decade, is -- is what the target is for.

So -- so it's pretty straightforward. Solar as a distributed resource can go just about anywhere, except where you don't want to put it from a state policy perspective. Wind can be a distributed resource. It can be economical, you know, a single turbine or multiple turbines, and you do see that in some places around New England.

Most of it is economies of -- most of it. Better economics are when you see a larger utility scale wind farm. And you know, getting up to the, at least the tens of megawatts, if not the hundreds of megawatts. So it makes sense that you would see it being connected in Maine, or begin to see the even larger scale of wind farms being considered for the ocean.

THE CHAIRMAN: Just on that latter point, I just have a question. My understanding is that in Europe they have a considerable amount

of offshore wind. Are the reasons we don't in the US, is because for some difference in the oceans, and technological or cost?

THE WITNESS (Fagan): No, it's not a technological difference. It's not a cost difference. It's an institutional difference and a governmental policy difference, purely.

Europe I think over the last few years has ramped up from just a few thousand to, I believe, they're upwards of 10,000 megawatts now with either plans or certainly goals, you know, that -- that double and triple that, you know, over the next few decades. And the technology has continued to evolve.

You know, primarily they're using larger sized turbines that allows the -- allows capture of economies of scale. So right now the -- the working turbines are on the order of five or six or seven megawatts, and it's inching up with every year. Whereas five years ago the working scale was more like, you know, three megawatts, two, three megawatts for an offshore facility. So it's just institutional on policy.

It's not -- not technological.

It's costly. I mean, those costs have been coming down, but Europe invested earlier in the offshore wind.

THE CHAIRMAN: The last one I'm interested, because you gave us some material from Massachusetts, is energy storage. That plan that Massachusetts -- a two-part question. The first, do you know if Connecticut either has or is looking into something similar, a program?

THE WITNESS (Fagan): I -- I don't know the status of where Connecticut is with storage. I can find that out and return a response around that.

Massachusetts, I'm a little bit more familiar with because they passed a law last year that incorporated storage as an alternative for those proposing to meet either the clean energy standards or the offshore wind requirements that the law called for.

But the law also said the state will determine whether or not it wants to set a procurement target for storage, and it made that determination at the end of last month, that they will set a procurement target. I think they -- they didn't really -- don't have the number yet,

but they'll set that number sometime during the first six months of this year.

And for comparison purposes, about maybe three or four years ago California set a target of 1.3 gigawatts of storage by 2024. You know, so given the scale of the systems, you know, you might expect that New England or Massachusetts, anyway you know, might have a target in the early 2020s that's, you know, on the order of 500 megawatts give or take, you know, the technology changes.

The -- the report that was done for Massachusetts, the executive summary of, which is an exhibit to my testimony, indicated that it was economical to have as much as 1700 megawatts of storage in New England. And for Massachusetts they were looking at 600 megawatts by 2020 as -- as a nice goal to consider.

Now I don't know if the targets that the Massachusetts Energy Department will set will be 600 megawatts by 2020. It could be. In a way it's, I mean, important that the resource is coming along. New England doesn't need to have storage connected up immediately to continue to operate its system reliably with more renewables

because they're, you know, they're behind California for example. It's going to take a little while to climb up to that level like California has.

And we have a different mix of resources. I mean, you know, in a sense the Quebec system service has a big storage reservoir for New England and we get quite a bit of energy from Quebec. And we may continue to get more, and the fact that there's a storage in Canada is sort of relevant to where New England goes with potentially considering battery storage, which is the currently -- the current sort of commercial storage that's -- that's -- it's on the cusp of being commercial, essentially.

THE CHAIRMAN: I guess I have one, one last question. I just wanted a quote. It's a -- I guess it's a long sentence or a short paragraph from the Siting Council's Docket F-2014/2015, Connecticut Siting Council review of ten-year forecast for Connecticut electric load and resources.

And in our conclusion, I'm quoting, this Council has considered Connecticut's electric energy future and finds that even taking into

account the most conservative prediction, the ISO New England 9010 forecast, and conservatively neglecting the effects of non-ISO New England dispatch distributed generation, the electric generation supply during the period 2015 to 2024 will be adequate to meet demand.

I'm assuming you followed me? Is that --

THE WITNESS (Fagan): I did follow you. Yeah, I would agree. I mean, the most recent information from the ISO New England and the CELT sort of clearly indicates significant circles of capacity in New England. And I know that the Connecticut forecast is Connecticut only, but Connecticut does indeed operate as part of that broader grid. So what's most important is the overall level of resource adequacy in New England.

And yes, it's safe to assume that based on what I've got in my testimony and based on ISO New England's projections of reserved capacity, we are resource adequate, absolutely.

THE CHAIRMAN: Okay. I thank you. We'll now go to cross-examination by the applicant.

MR. RAY: Thank you, Mr. Chairman.
Good afternoon Mr. Fagan. Jim Ray.
THE WITNESS (Fagan): Good afternoon.
MR. RAY: So it's fair to say that it's your opinion that the proposed plan is not needed. Right?
THE WITNESS (Fagan): Yes.
MR. RAY: And, you know, in response to the Chairman's questions, it's also fair to say that you believe some of these other resources such as energy efficiency and renewables, and along with the existing capacity will provide sufficient capacity to meet our electric needs now and in the future. Right?
THE WITNESS (Fagan): Yes, that's correct.
MR. RAY: Okay. Now I want to read a sentence from your report on page 3. Do you have your report in front of you?
THE WITNESS (Fagan): Direct or --
MR. RAY: Direct. I'm sorry.
All right. On page 3 starting on line 2, and I'm just going to read. You're talking about some of the different resources.

You say, these resources include energy efficiency and renewable resources that supplant the reliably need for the proposed KEC plant, and storage resources that support renewable resource integration and the development of an inherently more flexible electric power system.

Did I read that correctly?

THE WITNESS (Fagan): Yes, you did.

MR. RAY: So energy efficiency measures and behind-the-meter solar are two types of these resources that you spoke of. Correct?

THE WITNESS (Fagan): Yes, that's correct.

MR. RAY: And ISO New England publishes year-by-year numeric projections for both energy efficiency and behind-the-meter solar. Correct?

THE WITNESS (Fagan): Yes, they do. It's contained in the CELT report and they also publish every spring a distributed resource forecast that includes a lot of solar PV detail.

MR. RAY: And you reference those numbers in several of the tables in your report. Right.

THE WITNESS (Fagan): Yes.

MR. RAY: The ISO New England numbers, the Celt numbers?

THE WITNESS (Fagan): Yes, I also include specifically some of the pages from the CELT exhibit and --

MR. RAY: Right. That's in Exhibit 1, I believe.

THE WITNESS (Fagan): That's right. And a separate exhibit is the actual full distributed PV forecasts from ISO New England from 2016.

MR. RAY: Now you don't provide any other year-by-year numeric projections different than the ISO New England projections for energy efficiency measures anywhere in your report. Right?

THE WITNESS (Fagan): No, I don't think I do. I think I stay relatively conservative, and I used ISO New England's projections going forward.

MR. RAY: You use their projections?

THE WITNESS (Fagan): That's correct.

MR. RAY: Okay. And the same thing

for behind-the-meter solar. You don't use your own projections. You rely on the ISO New England projections?

THE WITNESS (Fagan): Yes, I do. But --

MR. RAY: That's fine.

THE WITNESS (Fagan): That's true.

MR. RAY: And in the various sections of your report you also mention other resources that will come online to supplant the reliability needs, such as utility scale wind and solar storage, and Canadian hydro imports. Some of the things you talked about with the Chairman just a moment ago. Right?

THE WITNESS (Fagan): Yes, and offshore wind resources also.

MR. RAY: Right. And you don't provide anywhere in your report any year-by-year numeric projections for new utility scale solar. Right?

THE WITNESS (Fagan): No, I don't. I -- I rely on the ISO New England's projection for solar resources going forward.

MR. RAY: And those are just the behind-the-meter solar resources. Correct?

THE WITNESS (Fagan): No. I -- I reference -- I reference the in front-of-meter or utility scale solar in my surrebuttal testimony and I also include the full solar PV forecast as an exhibit. And that exhibit, which contains a lot of information, breaks down the solar PV in New England into both utility scale and behind-the-meter small solar PV.

MR. RAY: Are those projections just ones for which are captured in the CELT reports with existing capacity supply obligations. There will be some in there. Right?

THE WITNESS (Fagan): Some of it. There's -- there's a lot of the solar. And New England does not attract the capacity supply obligations, because it's behind the meter and ISO New England treats it in a different way. They give it a credit and they reduce the load.

MR. RAY: But those are in the CELT reports, the behind-the-meter projections?

THE WITNESS (Fagan): Those are absolutely in the CELT reports. That's correct. And they --

MR. RAY: And you don't --

THE WITNESS (Fagan): I'm sorry.

Go ahead.

MR. RAY: You don't provide any year-by-year numeric projections for utility scale wind. Do you? And again, year-by-year numeric projections?

THE WITNESS (Fagan): No, I'm relying on ISO New England's projections to address reliability. Yeah.

MR. RAY: And the same thing, you don't provide any year-by-year numeric projections for new battery storage?

THE WITNESS (Fagan): No, I don't provide year-by-year projections. I reference the Massachusetts, the existence of the Massachusetts storage report, which came out at the end of last year.

MR. RAY: Which just talks about setting targets. Right? There's no projections in that report?

THE WITNESS (Fagan): No, that report doesn't talk about setting targets. The setting targets comes directly from the legislation that the Mass DOER set, just announced that it's going to set the targets. The energy --

MR. RAY: Which they haven't done

yet?

THE WITNESS (Fagan): Which they haven't done yet. The energy storage report, which I include as an exhibit, is an extensive report development under Mass DOER and it talks about a lot more than just setting targets. It talks about the overall cost benefit of storage.

MR. RAY: Are there any projections? I asked about year-by-year numeric projections of battery storage in your report.

THE WITNESS (Fagan): No, that wasn't what I was doing in my testimony.

MR. RAY: That was my question. That was my question -- was, are there year-by-year numeric projections in your report for battery storage?

THE WITNESS (Fagan): No, there's none.

MR. RAY: And you have not -- you're not relying on any numeric modeling of capacity demand in the ISO New England system to reach your conclusions. Correct?

THE WITNESS (Fagan): No, I didn't need to do any numeric modeling of ISO systems to reach my conclusions.

MR. RAY: It's a yes-or-no question. I just asked if you knew. I want to make sure I understand whether or not you've done any numeric modeling to support your conclusions?

THE WITNESS (Fagan): Numeric analysis, yes. Numeric modeling, not explicit in the way that myself as a consultant thinks about a modeling exercise using some sort of a formal tool.

MR. RAY: I'm not suggesting that you didn't talk about numbers in your report. I just want to make sure we're not -- that it's clear that you didn't do any modeling of this ISO New England system?

THE WITNESS (Fagan): No, not in a way I think you're characterizing.

MR. RAY: Computer modeling, did you do any computer modeling?

THE WITNESS (Fagan): No. I used a computer to do some of my analysis. We didn't do any analysis using a production cost simulation tool, or using a capacity expansion tool, or using -- ISO New England, for example, uses the GE MARS reliability assessment tool to look at loads and resource balance to come up with their

reliability metrics. And no, we did not operate any of those models. There wasn't a need to.

MR. RAY: Now you talked earlier about energy efficiency and those measures are generally funded by the state or the utility. Right?

THE WITNESS (Fagan): Energy efficiency measures are a combination of funded by all ratepayers and contributing contributions from those who participate in those programs.

MR. RAY: And you did not in your report anywhere provide a cost per megawatt for energy efficiency savings. Do you?

THE WITNESS (Fagan): No, but I do reference the Massachusetts, Connecticut and Rhode Island three-year energy efficiency plans that each of the states put out. And those reports, while not attached as an exhibit to my testimony, do contain information on the -- the costs of saved energy associated with the state utility efficiency programs.

MR. RAY: Now you stated earlier that the cost of energy efficiency was cheaper than the cost to deliver the -- generate electricity. Is that found anywhere in your

report, that analysis? Or can you point to me in your report where that's discussed?

THE WITNESS (Fagan): No, like as I just said --

MR. RAY: It's either in there or it's not. That's all I want to know.

THE WITNESS (Fagan): There's a reference to reports that have that information. The essence of my testimony was not to document in any kind of detail the costs associated with energy efficiency implementation.

MR. RAY: Okay. And I think we covered this last time, but it's fair to say that your report and your testimony in general doesn't deal with the cost of energy efficiency or behind-the-meter solar, or any other renewable resources and what those costs would be to ratepayers compared to a facility like Killingly?

THE WITNESS (Fagan): No, we did not do -- we did not do a direct analysis of costs associated with the alternatives to Killingly.

MR. RAY: Now a lot of these utility scale projects that you referred to earlier are often -- have power purchase agreements with the utilities. Right?

THE WITNESS (Fagan): Can you be more specific?

MR. RAY: Well, for example the Block Island. We talked about that a little bit last time, the Block Island offshore wind facility. That has a power purchase agreement, I believe, with Narragansett electric. Correct?

THE WITNESS (Fagan): Yes, it does have a power purchase agreement.

MR. RAY: And the cost of that power purchase agreement is passed along to the ratepayers. Correct?

THE WITNESS (Fagan): Yes, as is the cost of all electricity produced and delivered in New England.

MR. RAY: But it terms of the Block Island wind facility the costs there that are being borne by the ratepayers are millions, or hundreds of millions of dollars more today than what it would cost to buy that power from a more conventional fossil fuel facility. Correct?

THE WITNESS (Fagan): Oh, I don't know. I didn't do that analysis.

MR. RAY: You never looked at that issue?

THE WITNESS (Fagan): Oh, I certainly looked at the issue, but I can't comment to -- as soon as you start talking about -- I mean, you just put a hypothetical to me and I don't know the answer to it. You know, it wasn't my charge to take a look at that.

It's above market, absolutely. It's an above market resource. The State of Rhode Island said, let's go ahead and let's get moving with this stuff, and there, there you have it.

MR. RAY: Now the Killingly facility won't have a power purchase agreement. Correct?

THE WITNESS (Fagan): I -- I don't know. You could have a power purchase agreement and I might not see it publicly, but to my knowledge it's participating as a merchant facility. I don't know if you're going to have power purchase agreements associated with a portion of its capacity or energy. That's possible.

MR. RAY: You've not seen anything in the records to suggest that there's a power purchase agreement involved in this facility. Have you?

THE WITNESS (Fagan): No, I have not.

MR. RAY: And so the economic risk associated with the construction and operation of this plan is on the merchant developer. Correct?

THE WITNESS (Fagan): No, not necessarily. The costs to -- to construct a powerplant and sell its energy ultimately fall to ratepayers. You can look carefully at the mechanism, but all power generation and supplies in New England that flow to ratepayers, eventually are paid for ratepayers in some way, shape or form.

MR. RAY: The only way they'll flow to the ratepayers is if they clear the forward capacity market. That's one way which those costs ultimately will flow to ratepayers. Correct?

THE WITNESS (Fagan): There's certainly resources that don't participate in a forward capacity market and those costs still end up being borne by ratepayers in some way, shape or form. It's a fairly complex set, you know, you're sort of simplifying it.

There's the capacity market, yes. And --

MR. RAY: There's the energy markets as well. Right?

THE WITNESS (Fagan): There's the energy markets.

MR. RAY: And if they aren't successful bidding into the energy markets and they don't clear the forward capacity market, the people who are going to pay for that are the merchant developers and not the ratepayers. Right?

THE WITNESS (Fagan): I -- I don't know. I suppose that's possible. Anything can happen over time.

MR. RAY: You mentioned solar previously. There's still a fair number of government subsidies and tax incentives for solar. Correct?

THE WITNESS (Fagan): It's a dramatically lower level subsidies now compared to the past and the subsidies are continuing to decline over time.

MR. RAY: And the average capacity factor for a utility scale solar project is about 15 percent. Right?

THE WITNESS (Fagan): No.

MR. RAY: What is it then?
THE WITNESS (Fagan): It depends on where you are. It depends on --
MR. RAY: Fair enough. How about New England?
THE WITNESS (Fagan): It depends on whether or not it's on, you know, it's tracking or not. The average annual capacity factor probably ranges for utility scale solar probably, you know, I'd say between 15 percent, 25 percent give or take. That's the ballpark estimate.
MR. RAY: And you mentioned earlier when you were talking in response to the Chairman's questions about locations for all of this solar, and you mentioned rooftops. Correct?
THE WITNESS (Fagan): That's one possible -- that's one location, obviously.
MR. RAY: And installing rooftop solar on a, you know, per kilowatt basis is more expensive than utility scale solars on farmland, for example. Right?
THE WITNESS (Fagan): I think as a general characterization that's true, but what's different is that the value stream associated with rooftop solar is different from the value stream

associated with a utility scale solar. You might put a 20-megawatt utility scale solar, you know, at a substation out of, you know, distribution or some transmission level connection.

You put a rooftop solar, you know, all the way downstream at the end of the distribution system. So there's additional benefits associated with reduced losses on the distribution system. For example, potentially not having to build out or reinforce aspects of the distribution system.

So it's sort of an apples-and-orange comparison on the benefits side. So it's important to recognize that when you note that it's more costly to do a rooftop solar installation than it is to do a large utility scale solar installation along the highway.

MR. RAY: But for the person building it on his rooftop it's more expensive than on a per megawatt, per kilowatt basis, than what the developers of the utility scale project might do?

THE WITNESS (Fagan): I think that's probably true. I know that those --

MR. RAY: Is that what these

show --

THE WITNESS (Fagan): Well, these estimates have been changing. And you know, my testimony didn't get into all the nuances of the cost trends of solar. You know, I essentially reference the places where it's clear that the costs of solar resources have come down dramatically, especially in the recent last five years, give or take. Sort of as simple as that.

MR. RAY: You mentioned the battery storage and that new storage may be coming. New storage capacity in Massachusetts may become available based on new legislation and things of that nature?

THE WITNESS (Fagan): I think it's a little bit stronger than may become available. If the, you know, the law says it's allowed and the recent declaration by the energy department says they're actually going to set targets. So --

MR. RAY: It's not a mandate, though. Correct?

THE WITNESS (Fagan): I don't believe it's a mandate. I'm pretty sure that the law doesn't mandate it, but the law does say that they will look more favorably on some of the

responses to the energy and capacity RFPs if there's storage that's included.

MR. RAY: They'll also have to consider costs. Right?

THE WITNESS (Fagan): Sure. They'll certainly have to consider costs.

MR. RAY: And you mentioned that you provided only the executive summary of the -- you're referring to the state of the charge report. Correct?

THE WITNESS (Fagan): That's correct.

MR. RAY: Okay. I assume you're familiar with the report itself?

THE WITNESS (Fagan): Yeah, I -- I've looked through the executive summary and I've looked at parts of the main body of the report, but I haven't studied it.

MR. RAY: Mr. Chairman, this is something that Mr. Fagan provided, again the executive summary of the report as an exhibit. He also, in the footnote, provided the website addresses for the entire report.

I would like to show Mr. Fagan a portion of -- from the main body of the report

with your permission. I have extra copies. If it's necessary we can obviously provide the whole thing, but like I said, the website references are already there and he's provided the executive summary.

THE CHAIRMAN: Why don't you continue then?

MR. RAY: Thank you.

Now, Mr. Fagan I'm showing you an excerpt of that report. We've got the cover page and then starting with section 4.6.2 titled, energy storage technologies, from that report.

Do you recall seeing this previously?

THE WITNESS (Fagan): Yeah, I'm aware of the report. I've seen the report.

MR. RAY: And on table 4.1, which is on the third page at the bottom, it's page 83, identifies a number of different battery storage technologies such as short duration and medium to short duration and so on. Do you see that?

THE WITNESS (Fagan): I do. I see that.

MR. RAY: And then if you go over to page -- figure 4-4, which is on the last page,

this is titled, the distribution of storage in 2020 by power and energy. Do you see that?

THE WITNESS (Fagan): I do see that.

MR. RAY: And this, is it your understanding this was based on some optimization modeling that was done of energy storage throughout Massachusetts?

THE WITNESS (Fagan): No, I believe this is throughout New England, but if you could point me to where it says --

MR. RAY: Okay. Fair enough. Whether it's New England or Massachusetts is probably less important for purposes of my question.

If you look at the pie chart on the left-hand side for power in figure 4-4, that figure shows that 58 percent of the power comes from short duration storage, which has 30-minute duration at full power based on the previous table. Correct?

THE WITNESS (Fagan): That sounds reasonable.

MR. RAY: Okay. And then there's another 14 percent under medium to short duration

which has a one-hour duration at full power. Right?

THE WITNESS (Fagan): Looks about right, yeah.

MR. RAY: So that, that figure shows the 2020 distribution of power storage to be 72 percent of either short term or medium to short-term duration of energy storage. Correct? 58 plus 14, if my math is correct?

THE WITNESS (Fagan): Sure.

MR. RAY: Now isn't it true under the ISO New England market rules that for a resource to qualify as capacity in the forward capacity market it must be able to discharge electricity for at least two hours?

THE WITNESS (Fagan): I believe that's the current -- that's the current goal, yes.

THE CHAIRMAN: Excuse me, because all we have is this. Is there another figure that shows us for 2030. 2020 is right around the corner and your plan isn't even -- you'll be barely up and running by then. I'm interested --

MR. RAY: I don't know the answer to that question, Mr. Chairman.

THE CHAIRMAN: -- in what's going to happen. Not just -- it's almost the immediate future, is what I'm looking at here.

MR. RAY: But I can certainly have our team check on that.

THE CHAIRMAN: Thank you.

MR. RAY: Now I want to talk a little bit about the plan just to make sure we've got a common understanding. It's a combined-cycle powerplant. Right?

THE WITNESS (Fagan): Yes.

MR. RAY: And it's got a combustion turbine, a heat recovery steam generator and a steam turbine. Right?

THE WITNESS (Fagan): That sounds right.

MR. RAY: I'm not suggesting exclusively there's other, other equipment. Now that's different than a simple-cycle plant. Right?

THE WITNESS (Fagan): Yes, that's correct.

MR. RAY: Simple-cycle plants generally operate in the 30, 40 percent efficiency range. Does that sound right to you?

THE WITNESS (Fagan): No. Simple-cycle plants could be much higher than 30 to 40 percent efficiency depending on the vintage of the simple-cycle plant.

MR. RAY: Well, they're not going to be as high efficiency as a combined-cycle plant like Killingly. Right?

THE WITNESS (Fagan): No, it shouldn't, not if you're operating a combined-cycle plant in the --

MR. RAY: Sixty, 65 percent?

THE WITNESS (Fagan): -- with relatively high average on your capacity factor, that's correct.

MR. RAY: I'm not talking about the capacity factor. I'm talking about the efficiency rating of the plant?

THE WITNESS (Fagan): Yes, the overall efficiency rating is higher for a combined-cycle plant than it would be for a simple-cycle plant, but you used the phrase, 30 to 40 percent. There are later vintages of simple-cycle plants that I believe achieve something greater than 40 percent.

MR. RAY: The primary fuel for this

plant would be natural gas. Right?

THE WITNESS (Fagan): That's my understanding, yes.

MR. RAY: And you understand that, and tell me if you don't, that NTE has a firm contract for supply and transport of natural gas for the plant. Do you understand that?

THE WITNESS (Fagan): I think I understand that it has one for seven years. I don't -- I'm not familiar with the contract. I don't know what it --

MR. RAY: You have not looked at that at all?

THE WITNESS (Fagan): -- what it spells out. It's not relevant to my testimony.

MR. RAY: That does mean that they are not reliant on, for example, pipeline expansion in order to get gas for the plant. I'm not talking about the pipeline lateral that will come, but I'm talking about expansion of, like, the Algonquin pipeline?

THE WITNESS (Fagan): Yeah, I don't know. This isn't an area that I focus my time and effort on.

MR. RAY: And are you familiar with

the plants having interruptible gas supply?

THE WITNESS (Fagan): I'm familiar generically with that concept, yes.

MR. RAY: And do you know that that's different than plants with firm gas supply?

THE WITNESS (Fagan): Yes, I do understand the difference.

MR. RAY: Basically the people having interruptible supply are more likely to be -- have their gas supply curtailed during winter periods when there's a much higher demand for natural gas. Right?

THE WITNESS (Fagan): I don't know. I don't know the statistics on the likelihood of curtailment during the wintertime.

MR. RAY: But you know that interruptible supplies will be interrupted before anybody with a firm contract?

THE WITNESS (Fagan): Well, they can be, certainly.

MR. RAY: Now assuming its air permit is granted, they'll also have the capability to use ultralow sulfur diesel for as much as 720 hours per year. Right? Are you familiar with that?

THE WITNESS (Fagan): That's my general understanding, yes.

MR. RAY: And that's -- that makes it a dual-fuel facility. Correct?

THE WITNESS (Fagan): Now that's correct.

MR. RAY: Another term I've heard and learned about is heat rate. Are you familiar with that term in the context of powerplants?

THE WITNESS (Fagan): Yes, I am.

MR. RAY: And so, that's defined as the amount of fuel used to produce a certain amount of electricity. Right?

THE WITNESS (Fagan): That's correct.

MR. RAY: And so if you're comparing powerplants using the same fuel, the one with the lower heat rate uses less fuel to produce the same amount of electricity. Right?

THE WITNESS (Fagan): Yeah. All else equal, yeah. Sure.

MR. RAY: And all else being equal and using less fuel the plant with the lower heat rate would generate less emissions. Right?

THE WITNESS (Fagan): That's not

necessarily true. I think -- I think it often goes with it. The lower heat rate tends to be a lower emitting plant, but you have to look at the emissions coefficients as opposed to just the BTU per kilowatt hour.

MR. RAY: Two plants, identical emissions controls and all of those type of things, the one with lower heat rate is going to generate less issues?

THE WITNESS (Fagan): You needed to say that. It needed to -- you have to say, all else equal, so in terms of the emission controls have to be the same in order for you to make the conclusion that a lower heat rate is a lower emission --

MR. RAY: If I didn't say that, I apologize. I thought I did.

THE WITNESS (Fagan): -- on the same fuel. I mean, the reason -- the only reason I bring it up is, so much of my testimony is not to go into the thermal detail of the KEC plant. You know, so I'm very familiar with generically, but I have not looked at every single area that you are talking about in terms of KEC's application and all the thermal details associated

with the plant.

MR. RAY: If you turn to page 68, we'll talk about what you have talked about --

THE WITNESS (Fagan): Sure. No, I --

MR. RAY: -- on your direct testimony?

THE WITNESS (Fagan): I reference the heat rating, absolutely.

Yes.

MR. RAY: All right. And that, that table is titled, illustration of the most efficient combined-cycle generation in New England. Correct?

THE WITNESS (Fagan): That's correct.

MR. RAY: And it shows the annual heat rate for a number of facilities. Right?

THE WITNESS (Fagan): It shows the average annual heat rate for a specific year based on data from USEIA.

MR. RAY: And over on page 69 starting on line 9, you acknowledge that the applicants state the full load heat rate was 6529 BTUs per kWH?

THE WITNESS (Fagan): Yes, that's right. The applicants do state that.

MR. RAY: Okay. If these -- comparing to what's stated on page 68, that is a lower heat rate than any of those facilities. Correct?

THE WITNESS (Fagan): Well, no. Go back to 69. The full load heat rate is 2569 without duct burners, and 7,069 BTUs with duct burners. I don't have a sense of what the applicant's plan is for operation with or without duct burners over the course of the year.

MR. RAY: But even with duct burners, it's lower than just about every facility on this list. Right?

THE WITNESS (Fagan): It is. It is lower than many of them. And it's --

MR. RAY: All but one. Correct? And the one being with duct burners?

THE WITNESS (Fagan): In fact -- in fact all but one. That's -- that's correct.

MR. RAY: Thank you. I want to direct your attention to what's been marked for administrative notice by the Council at number 33, which is the November 17th remarks of ISO New

England's CEO Gordon van Welie at the New England Canada Business Council's annual energy conference. And I have copies for you and I have copies for the Council, if you would like as well.

You're familiar with Mr. van Welie. Right?

THE WITNESS (Fagan): Yes, I know that he's the president and CEO of ISO New England. Correct.

MR. RAY: And the title of this is, challenge of ensuring system reliability through wholesale markets as the resource mix evolves. Correct?

THE WITNESS (Fagan): Yes.

MR. RAY: And if you could turn to page 6? Now this slide is entitled, ISO New England is focused on developing solutions to the region's top reliability risks. Right?

THE WITNESS (Fagan): Yes.

MR. RAY: And in the last section there's a bullet about integrating renewable resources. And CEO van Welie said that quote, renewable resources provide valuable energy production and are typically not reliable capacity resources. Correct?

THE WITNESS (Fagan): I see where he says that, yes.

MR. RAY: Okay. And he also says to assure reliability the region needs fast responding flexible capacity resources that are not constrained in their operation. Right?

THE WITNESS (Fagan): That's correct.

MR. RAY: And you agree that the electric system in New England needs capacity resources that are both dispatchable and schedulable to support the integration of renewables as you suggest. Right?

THE WITNESS (Fagan): Yes, I do agree with that.

MR. RAY: And in fact, if you look on page 10 of your testimony -- bear with me. I want to find the right spot. Down on line 15 it says, the proposed plant shares some aspects of the characteristics of dispatchability or schedulability needed for renewable resource integration. Right?

THE WITNESS (Fagan): Yes.

MR. RAY: Now I want to talk a little bit about the capacity planning process.

One of the things that -- ISO New England looks at summer peak load, is one of the factors they look at in their capacity planning process. Right?

THE WITNESS (Fagan): By capacity planning process, what are you referring to?

MR. RAY: Well, fair enough. It's a fair question to an unfair question.

Each year ISO New England generates the CELT reports. Right?

THE WITNESS (Fagan): Yes, that's correct.

MR. RAY: Okay. And those are just so we create a clear record that's the forecast report of capacity energy loads and transmission. Right?

THE WITNESS (Fagan): Yes.

MR. RAY: And the most recent one is the 2016 to 2025 CELT report dated May 1, 2016. Correct?

THE WITNESS (Fagan): That's correct.

MR. RAY: And in fact, you take some excerpts from that -- are found in Exhibit 1 of your report. Right?

THE WITNESS (Fagan): Yes.

MR. RAY: Now first of all, I just want to make sure on page 5 of your direct testimony you say there's no short-term reliability need for the plan. Right?

THE WITNESS (Fagan): That's correct.

MR. RAY: And you define short-term is through 2020. Right?

THE WITNESS (Fagan): Yes that's correct.

MR. RAY: NTE is not suggesting that this plant, which isn't scheduled to go online until 2020, meets some sort of short-term need as you've defined it. Right?

THE WITNESS (Fagan): I don't believe NTE is suggesting that. I'm just putting into context the overall reliability structure.

MR. RAY: Okay. Fair enough. Then you also say there's no medium-term need, which you defined as 2021 to '25 in your mind because there's surplus capacity. Right?

THE WITNESS (Fagan): That's correct.

MR. RAY: And you state on page 5 beginning on line 18, you said primarily this is

because -- I'm sorry. I want to make sure you get there.

THE WITNESS (Fagan): I'm there.

MR. RAY: Okay. Primarily this is because net peak load growth in New England is projected to be flat or declining through the next decade. Did I read that correctly?

THE WITNESS (Fagan): That's correct.

MR. RAY: Okay. And then similarly on page 15, starting on line 15 you state the forecast of load and capacity requirements change every year. Recently these changes have led to flattening or even declining net load forecasts. Did I read that right?

THE WITNESS (Fagan): Yes, you did.

MR. RAY: Okay. So I want to focus on what you've referred to as flat or declining load forecast.

Now ISO New England prepares projections of summer peak load on a yearly basis and publishes them in the CELT reports. Correct?

THE WITNESS (Fagan): They do. They also publish the net load numbers.

MR. RAY: Right. Now, okay. So

there are two, there's peak load and then there's net peak load. Right?

THE WITNESS (Fagan): That's right. You're referring to --

MR. RAY: I want to talk about both, so we'll make sure that we're careful in our terminology.

THE WITNESS (Fagan): Sure.

MR. RAY: In section 1.1 of the CELT report they provided a table, table 1.1 that includes the summer peak load forecast. Right?

THE WITNESS (Gresock): That's correct.

MR. RAY: And you've got that in front of you?

THE WITNESS (Fagan): I do.

MR. RAY: I have copies if anybody wants the table 1. It's in Mr. Fagan's Exhibit 1, but if anybody wants it, just a copy of the table 1.1 it might be easier.

All right. If we start with the table 1.1, line 1.1 it says, reference without reductions. That's peak load before they make reductions to get the net peak load. Correct.

THE WITNESS (Fagan): Yes, it's

a -- it's a counterfactual. It's not a real -- it's --

MR. RAY: Projections. Right?

THE WITNESS (Fagan): It's a gross load projection. That's right.

MR. RAY: Projection. Okay. And if you look at that going from 2015 all the way across to 2025 it shows an increase in projected summer peak load without reductions each year. Correct?

THE WITNESS (Fagan): That's what it says, yeah.

MR. RAY: And then to get to -- so there's no projected decline in summer peak load. Right?

THE WITNESS (Fagan): As gross peak load as defined and characterized in this table increases from 28660 to 31794. Yeah, there's no --

MR. RAY: I just want to make sure we're talking about the same thing?

THE WITNESS (Fagan): That's factual.

MR. RAY: And to get to net summer peak load ISO New England, again to get to net

projected summer peak load, ISO subtracts its projections for behind-the-meter solar and passive demand response from its projections of growth summer peak load. Right?

THE WITNESS (Fagan): Yes, that's correct.

MR. RAY: Okay. And net summer peak load is what's shown in line 1.3. It says with reduction for the BTMPV. That's behind-the-meter solar, and PDR which is passive demand response. Correct?

THE WITNESS (Fagan): Yes, that's correct.

MR. RAY: Okay. This is now ISO New England's projected net summer peak load. Right?

THE WITNESS (Fagan): That's correct.

MR. RAY: And that number is 26661 in 2015. Right?

THE WITNESS (Fagan): That was a forecast of 26661.

MR. RAY: These are all projections?

THE WITNESS (Fagan): In two

thousand -- that's -- that's correct. Yeah, 2015? Actually, 2015 might be the actual.

MR. RAY: Okay. And it goes up in 2016 to 26704. Correct?

THE WITNESS (Fagan): Yes, that's correct. And again, that's a projection.

MR. RAY: Understood. These are all -- they're forecasts now. Right? Projections for net summer peak load?

THE WITNESS (Fagan): That's correct.

MR. RAY: Now in 2017 it goes down to 26698. That goes down by 6 megawatts. Right?

THE WITNESS (Fagan): That's right.

MR. RAY: And then isn't it true that every year from 2018 through 2025 the number for projected net summer peak load increases?

THE WITNESS (Fagan): Yes, that's correct. On an England -- on a New England-wide basis, so that's a little bit different when you look at the states individually.

THE CHAIRMAN: Excuse me. Do we have a percentage? Is there a table showing percentage increase?

MR. RAY: There may be one with my

handwritten notes.

THE CHAIRMAN: Because some might argue that 26661 and 2712 is not exactly a robust increase.

MR. RAY: Mr. Chairman, I'm not here to argue the nature of the increase.

THE CHAIRMAN: I was just curious if you had any?

MR. RAY: I believe I seem to recall a 1 and half percent increase over that time, but I'm not sure.

THE CHAIRMAN: 1 and half percent total, not yearly?

MR. RAY: Right. But it's fair to say for that period of time, projected net summer peak load is either flat or increasing. It's not declining. Correct?

THE WITNESS (Fagan): As I just said, in some states -- in one state, Rhode Island, it's declining. In the rest of New England it's essentially flat. And with respect to your questions, sir, on page 45 of my testimony I show what that number is. It's not 1.5. It's 0.17 percent compound average annual growth rate.

MR. RAY: That's annual.

THE WITNESS (Fagan): The net peak load.

MR. RAY: That's annual. Right?

THE WITNESS (Fagan): It's a compound -- compound annual growth rate. So you take the -- take the entire ten-year period and you -- and you develop what the year-over-year number would be based on their projection for 2025.

MR. RAY: I just want to make sure Mr. Chairman understood that I was not suggesting it was 1 and a half percent per year.

But it's not declining?

THE WITNESS (Fagan): It once was that.

MR. RAY: It's not declining. Correct?

THE WITNESS (Fagan): It once was 1.6. I mean, in 2010 the projection was 1.6. In 2016 the projection was .17, I mean, which is reflective of a key point in my testimony that you look at the vintages of the forecast in each year, the projected peak load for a given out year goes down.

MR. RAY: But the trend is not

declining. Correct? It's flat, or if anything, it's increasing on a year-to-year basis?

THE WITNESS (Fagan): The essence of my testimony is what I just referenced now in terms of reliability, that it's essentially -- it's projected to be positive .17 for New England right now.

MR. RAY: The essence of your testimony is on page 5. Primarily this is because net peak load growth in New England is projected to be flat or declining?

THE WITNESS (Fagan): It's projected to be declining in Rhode Island. It's projected to be flat elsewhere.

MR. RAY: It says, growth in New England. It's not declining in New England. Correct?

THE WITNESS (Fagan): I -- right now CELT 2016, the number is .17, as I show in my testimony. It's -- it is projected to -- well, essentially the -- the projections have continued to come down. Year over year the projected load, net peak load for the years in the future has been lower and lower, and lower, and lower with each year as the actual energy efficiency and

behind-the-meter solar PV gets picked up in the data. And then ISO New England redoes their analysis every year. It comes out with a new forecast.

And that's -- the declining trend that's referenced in the text is seen in the box in my graph on page 45.

MR. RAY: We'll come to that one. Thank you.

Now in order to get the trends that we see we have -- the net peak load they have subtracted out behind-the-meter solar and passive demand response. Right?

THE WITNESS (Fagan): That's correct.

MR. RAY: And in order to get the trends we are seeing, put aside our differences as to how you characterize them, they've gotten to those trends as a result of behind-the-meter solar and energy efficiency measures that are growing from anywhere from 5 percent to 13 percent in those figures. Right?

THE WITNESS (Fagan): Yeah, they're definitely growing. I'd have to see where you're -- where the 5 and 13 numbers you reference

come from, but that's what they do. They look at the energy -- they have an energy efficiency forecast and they have a distributed PV forecast. They put those things together and they come up with CELT and the net load forecast.

MR. RAY: So in order to get even flat we have to continue to relatively significant percentage increases in behind-the-meter solar and energy efficiency in all those years through 2025?

THE WITNESS (Fagan): We have to continue to see the trends that we've seen, yes.

MR. RAY: Now long term, you said there's no long-term reliability. Correct?

THE WITNESS (Fagan): For the KEC plant, yes, that's correct.

MR. RAY: Sorry. I should have been a little more specific there.

And among the reasons, if you go to page 6 of your testimony, starting on line 6, is steadily increasing renewable energy supplies and increasing levels of efficiency, like we've been talking about. Right?

THE WITNESS (Fagan): Yes, that's correct.

MR. RAY: And then it says these

along with new storage capacity will, and I quote starting on line 10 of page 6, eventually lead to increasing retirements of the remaining older primarily capacity providing fossil units in New England. Did I read that correctly?

THE WITNESS (Fagan): Yes, you did.

MR. RAY: Let's talk a little bit about retirements. You provide in Exhibit 6 to your report excerpts from the September 28th remarks of ISO New England CEO van Welie. Right?

THE WITNESS (Fagan): Yes, that's correct. Excerpts from a different day I believe than the presentation that you provided as an earlier exhibit.

MR. RAY: Yeah, and while I've got a full complete copy of the September 28th one as well, they are similar but different. I think just it looks as if he repackaged for a subsequent presentation.

THE WITNESS (Fagan): Yes, I have that, my Exhibit 6 in front of me.

MR. RAY: My partner will be brining you a full copy of that, those remarks for you to take a look at.

And just for the record while he's

passing those out, that's NTE administrative notice item number 2.

Now on page 2 which is immediately after the title page, the slide is entitled, ISO New England is focused on developing solutions to the region's top reliability risks. Correct?

THE WITNESS (Fagan): Yes, I believe it's the same as the page in the other handout that you provided, or similar --

MR. RAY: The heading is the same. I'm not sure the whole thing is, but we'll talk about that.

THE WITNESS (Fagan): You're right about that.

MR. RAY: And the very first bullet there states that New England will need sufficient replacement resources to replace retiring resources. These resources must be able to perform under adverse weather conditions. Did I read that correctly?

THE WITNESS (Fagan): Yes.

MR. RAY: And you're familiar and have talked about the fact that ISO New England has identified a number a resources that are at risk of retiring. Correct?

THE WITNESS (Fagan): That's correct.

MR. RAY: And in fact on your surrebuttal report now starting on page 3, line 10, and I believe you're referring to these plants that ISO New England has identified is at risk to retire, that quote, they will retire if the combination of FCM prices and peak period energy prices are too low to support their own going forward operating costs.

But these circumstances, low FCM and energy prices are to be expected only when sufficient new supply and/or lower peak demand is present. Did I read that correctly?

THE WITNESS (Fagan): You did.

MR. RAY: So you state that at least on one of the factors that might cause these older plants to retire is new supply. Correct?

THE WITNESS (Fagan): That's correct.

MR. RAY: Okay. And that statement is not limited to new renewal of supply. Right? So new supply from a plant like Killingly might also create the conditions that could cause them to retire?

THE WITNESS (Fagan): Yeah, but you have to be careful. New renewables, it immediately begs the discussion about the construction of the supply curve in the forward capacity market.

MR. RAY: I am not begging for that conversation.

THE WITNESS (Fagan): My emphasis was on --

MR. RAY: Mr. Paterno has begged me not to let him drown again.

THE WITNESS (Fagan): Well I mean, it is important, the supply curve, which is generally not given a lot of attention, and Mr. Paterno's testimony is fairly critical of what's going on in the FCM.

So if you have a new renewable resource that gets in under a state policy, for example, it pushes the supply curve to the right. Whereas a new merchant generator, such as a CT or a CC plant that participates directly in the FCM is going to come in at some marginal mid price according to what the merchant supplier feels they need to receive if they want to go ahead and construct the plant.

So it's sort of two different things, and you have this bit of a conundrum where New England has a lot of renewable resources that are trying to get to the grid pursuant to state policies on RPS and on the Global Warming Solutions Act-like policies, but that doesn't mesh that well with all of the details of the forward capacity market construct.

And the ISO New England and the stakeholders in New England are beginning to hash that out and to align the wholesale markets with state policies in New England. And that's likely to be a multiyear, if not a longer process. And the same way that the forward capacity market has evolved over time with changes to its tariff structure, to its tariff at FERC, those changes will continue as this integrating markets and public policy initiative winds its way through the stakeholder processes and eventually through FERC.

MR. RAY: Mr. Chairman, I'll withdraw the question, but I promise a simple question.

I want to focus on retirements. Now if you look at page -- I'm now back to your direct testimony on page 7. You're talking about

units that have already retired. And then you state starting at line 6, it says, the remaining so-called at risk fossil units in New England have already indicated their participation in FCA-11 for the 2021, i.e., they are not retiring before then. Do you see that?

THE WITNESS (Fagan): I do see that.

MR. RAY: And then you talk about a subset of those at-risk units, they have indicated auction price sensitivity. Right?

THE WITNESS (Fagan): That's -- that's correct. ISO New England -- ISO New England made this indication.

MR. RAY: Right, and that means those units have the option to get out of the auction if the clearing price gets too low. Right?

THE WITNESS (Fagan): That's correct.

MR. RAY: So that could be as much as 1600 megawatts right there. Right?

THE WITNESS (Fagan): I believe the number is 1622 megawatts, is the number that ISO New England gave to FERC as units that are at risk

to retire depending upon price.

MR. RAY: In FCA-11?

THE WITNESS (Fagan): In FCA-11. That's correct.

MR. RAY: And on page 13 of your testimony you're asked a question starting at line 7, what is the level of planning reserve capacity in New England at this time accounting for planned retirements and editions? Do you see that?

THE WITNESS (Fagan): I do.

MR. RAY: And in your answer you referred to the CELT report. Correct?

THE WITNESS (Fagan): That's correct.

MR. RAY: Okay. So if we could go back to the CELT report. And I just want to note you provide a table there, table 2 at the bottom of page 13?

THE WITNESS (Fagan): That's correct.

MR. RAY: That's information that was extracted from the CELT report. Right?

THE WITNESS (Fagan): That's correct. The specific numbers and notations and titles I believe are verbatim, although the table

doesn't necessarily have everything, but it's on the same table.

MR. RAY: But you stop at 2023. The CELT report goes to 2025. Correct?

THE WITNESS (Fagan): Oh, that's true also.

MR. RAY: That was just an observation. That was not meant to be any type of criticism. I just want to make sure we're working off the same thing. I'd like, if you don't mind, if we could just work off the CELT report, the table 1.1.

And if you look at section 4.1 in the CELT table, that says that's installed reserves based on CSOs of generating resources line 2.1; active DR, line 2.2.1; and imports, line 2.3. Right?

THE WITNESS (Fagan): That's correct.

MR. RAY: Okay. And if you look at the numbers on line 4.1.1, which reflects megawatts of installed reserves, that shows a decline in reserves for every year from 2019 to 2025. Correct?

THE WITNESS (Fagan): Yes,

that's -- that's correct. And I think that's probably attributable to the increased -- the increased load. It's a relatively small decline.

MR. RAY: Now if you look at line 2.1 in table 1.1, that line indicates the total megawatts of the generating resources based on FCL obligations. Correct?

THE WITNESS (Fagan): I'm sorry. Could you give me that reference again?

MR. RAY: Sure. Line 2.1 of table 1.1?

THE WITNESS (Fagan): Yes.

MR. RAY: That's generating resources, total megawatts of generating resources based on FCM obligations. Correct?

THE WITNESS (Fagan): That's correct.

MR. RAY: Okay. And that number for 2020 is 31441. Correct?

THE WITNESS (Fagan): That's correct.

MR. RAY: And it's that, that number remains at 31441 for years 2020 through 2025. Correct?

THE WITNESS (Fagan): That's

correct. It does.

MR. RAY: Okay. So those numbers for 2020 through 2025 don't reflect any reductions for possible retirements in those years. Correct?

THE WITNESS (Fagan): That's correct, just like they don't reflect possible additions of additional resources that would come online, such as Canadian Hydro or of the capacity value associated with utility scale wind or solar.

MR. RAY: My question was related to retirements?

THE WITNESS (Fagan): Okay. Well, that's fine.

MR. RAY: And that was my question?

THE WITNESS (Fagan): But in considering the context of retirements in future years it's critical to also take into consideration what's going on in those future years with additions, because retirements don't happen in a vacuum.

MR. RAY: And you've not provided any models or projections like ISO New England does here. Correct? Year-by-year projections.

THE WITNESS (Fagan): No, I have not. I do rely on the fact that the New England

region, the states individually and then the region as a whole have renewable portfolio standards and policy goals that are striving to get more renewables on. That's the pressure for seeing additional renewable resources show up in those future years.

MR. RAY: So we know that at least 1600 megawatts could retire in the 2020/2021 capacity commitment period if the clearing price in FCA gets too low. Right?

THE WITNESS (Fagan): That's correct.

MR. RAY: And we also expect that Bridgeport Harbor 3, Unit 3 will retire in 2021 as a condition of Bridgeport Harbor Unit 5 coming online. Right?

THE WITNESS (Fagan): I believe that's a possibility, yes.

MR. RAY: Okay. And then there's a number of other units that ISO New England has identified as at risk for retirement. Correct?

THE WITNESS (Fagan): Yeah. Certainly, this is the 5600 megawatts.

MR. RAY: So the reserves calculated in 4.1, line 4.1 that are declining

after 2019 don't encounter any possible retirements after years 2020?

THE WITNESS (Fagan): That's -- that's correct. Like I just said, they don't account for retirements and additions in the later years.

MR. RAY: Now on page 26 --

MR. BERMAN: Of what document?

MR. RAY: I'm sorry?

MR. BERMAN: Of what document?

MR. RAY: Direct testimony, sorry. Thank you.

That's a table of all the at-risk units. Right?

THE WITNESS (Fagan): Yes, it is.

MR. RAY: Okay. Now not counting Brayton Point, which is already scheduled to retire. Correct?

THE WITNESS (Fagan): That's correct.

MR. RAY: The capacity represented by these at-risk units is over 5500 megawatts. Right?

THE WITNESS (Fagan): That's correct.

MR. RAY: And I think when you subtract those out of the generation capacity supply obligations, you have 25794 shown down there at the bottom, near the bottom of your chart. Right?

THE WITNESS (Fagan): The 25794 is everything else in New England, the generators with CSOs for 2019.

MR. RAY: And then you add back in some capacity supply obligations representing demand resource and in imports. Right?

THE WITNESS (Fagan): That's correct.

MR. RAY: And that gets you to 29990. Correct?

THE WITNESS (Fagan): Exclusive of the 5600 megawatts of resources.

MR. RAY: Yeah, you've taken that out. Those, that represents taking out the at-risk retirements. Right?

THE WITNESS (Fagan): Sure. That's just math.

MR. RAY: But I just wanted to make sure that it's clear what -- how you arrived at that number?

THE WITNESS (Fagan): Yes, it's a subtotal, non-at-risk demand and imports. That's correct. That's generation demand and imports exclusive of the 5600 megawatts of existing capacity.

MR. RAY: Okay. And the net installed capacity requirement for 2020 is over 34,000 megawatts. Correct?

If you have the exact number I'd be happy to --

THE WITNESS (Fagan): I believe it's 34070, but let me not guess. Yes, the net I see are for 2020/2021 is 34075 megawatts.

MR. RAY: Thank you. Now the forecasts that are in those CELT reports, that those are used as part of the preparation of those yearly installed capacity requirements. Correct?

THE WITNESS (Fagan): I'm sorry. Could you repeat that?

MR. RAY: Yeah, the data that's prepared in those CELT reports, the projections and things like that, you talked earlier about the probabilistic model that you used to generate the installed capacity requirement. Some of that information from the CELT reports is part of that

process. Right? Used in the preparation of the installed capacity requirement. You know, it's preliminary. We don't need to get into the discussion. I'll withdraw the question.

THE WITNESS (Fagan): I mean, the installed capacity requirements, yes, does depend in part upon attributes of generation resources.

MR. RAY: Fair enough. In January of each year ISO New England publishes a report that includes the installed capacity requirement for the capacity commitment period three years out. Right?

THE WITNESS (Fagan): Yes, that's correct. They've -- they've done that for FCA-11, yeah.

MR. RAY: And in Exhibit 8 of your testimony you talk -- is the January 2016 report.

THE WITNESS (Fagan): That's correct. That's the most recent one available at the time of the filing.

MR. RAY: All right. And on page 15 of that -- if you could turn to page 15? It's right at the beginning. It states that the ICR, or the -- excuse me. The ICR is the minimum level of capacity required meet the reliability

requirements defined for the New England area, balancing authority area. Correct?

THE WITNESS (Fagan): That's correct.

MR. RAY: If you turn to page 20 of your direct testimony?

THE WITNESS (Fagan): Yes.

MR. RAY: Now in table three there you list the ICR and NICR for various periods. Right?

THE WITNESS (Fagan): That's correct.

MR. RAY: So for example, the first column under the heading 2017, that's for the 2017/2018 capacity commitment period. Right?

THE WITNESS (Fagan): Yes, that's correct, the one coming up this year.

MR. RAY: No, that's FCA-8 it says underneath there?

THE WITNESS (Fagan): Right. But it's the capacity period for 2017/'18 coming up this year.

MR. RAY: I'm sorry. I thought you meant the auction.

THE WITNESS (Fagan): Beginning

summer this year.

MR. RAY: Now FCA-8 was for that capacity commitment period. Right?

THE WITNESS (Fagan): That's correct.

MR. RAY: Okay. And that was held in February of 2014?

THE WITNESS (Fagan): That's correct.

MR. RAY: Now the number you list there for installed capacity requirement, 34246, that's an October 2016 number. Correct?

THE WITNESS (Fagan): Yes, that's correct. They update it every year.

MR. RAY: That's not the number that was used during the forward capacity auction number 8. Correct?

THE WITNESS (Fagan): That's correct.

MR. RAY: And the same thing for the net installed capacity requirement, that's an October 2016 number. Correct?

THE WITNESS (Fagan): That's correct.

MR. RAY: And the NICR was higher

at the time of FCA-8. Right?

THE WITNESS (Fagan): Subject to check, that that may be the case. I don't think I have that number in front of me right now.

MR. RAY: But then if you go to the capacity supply obligation role where it's 33712 that's the amount that actually cleared at the time of the auction. Right?

THE WITNESS (Fagan): Yes, that's correct.

MR. RAY: And in fact, at the time of the FCA-8 the amount that cleared the auction received capacity supply obligations was actually less than the NICR. Correct?

THE WITNESS (Fagan): I don't know. Subject to check, that might be the case, but that's not what this table is about.

MR. RAY: So you don't recall that at the time of the auction there was actually a deficit that cleared?

THE WITNESS (Fagan): I recall that one of the years that was definitely the case and it may very well have been this year, but like I said, subject to check that might have been the case.

MR. RAY: Okay. And it wasn't until the peak demand projections came out in subsequent years that a surplus appeared to exist, assuming that that was a deficit at the time of the auction?

THE WITNESS (Fagan): Yes, which is part of my primary point, that when you get closer in time and you have a better handle on the forecast, you know, lo and behold perhaps you've bought too much. So you have to look at the trends when you're doing this and think carefully about whether or not you might be buying too much.

MR. RAY: But they certainly didn't buy too much that year. Right, if that's the year that there was a deficit?

THE WITNESS (Fagan): Well, no. They actually did buy too much that year.

MR. RAY: Not at the time. They didn't think they were buying too much at the time. Right?

THE WITNESS (Fagan): They didn't think they were buying too much --

MR. RAY: And that's the purpose of the annual reconfiguration auctions. Right?

THE WITNESS (Fagan): That's

correct. The purpose of that new reconfiguration auction is to -- is to rebalance when you have more information.

MR. RAY: And you don't discuss those in here, what happened at the subsequent annual reconfiguration auctions?

THE WITNESS (Fagan): I referenced the existence of those auctions as an important part of doing the overall capacity balancing as we get closer to realtime and you have a better handle on the forecast. But I don't -- I don't do an analysis of the reconfiguration auction results, no.

MR. RAY: Now on figure 1 over on page 22, if you would go to that? All the numbers in that table, the first line, for example, net installed capacity requirement, they're all for the year 2020. Correct?

THE WITNESS (Fagan): Yes, the intent of this table and graph is to show how things change over time for thinking about a particular year in the future.

MR. RAY: But in each one of those years -- for example, in 2011, not only did they do a projection for 2020, but they also did a

projection for 2018, 2019, 2021. Right?

THE WITNESS (Fagan): Yes, in the -- in the CELT step at that point in time.

MR. RAY: And isn't it true that in one of those projections in 2011 that there was an increase from 2018 to 2019 projection, and an increase from 2019 to 2020, and an increase from 2020 to 2021?

THE WITNESS (Fagan): Certainly. Back in 2011, yes.

MR. RAY: Isn't it the same for everyone of those years you show here?

THE WITNESS (Fagan): That --

MR. RAY: We already looked at 2016, so --

THE WITNESS (Fagan): That would not surprise me. I mean, this again goes to one of my core points, that they project too high. And they're getting -- those projections are coming down as indicated in my figure 6 on page 45 in my direct testimony.

MR. RAY: But they always show either a flat or an increasing trend from one year to the next?

THE WITNESS (Fagan): The --

MR. RAY: That's a simple question.
THE WITNESS (Fagan): I know, but the answer --
MR. RAY: That's all I want to know. What do the numbers say?
THE WITNESS (Fagan): The answer to that question is on page 45 of my direct testimony. What the trends show is each year the actual projection of what the growth rate looks like for the next ten years comes down, and down, and down, and down.
MR. RAY: And as you get closer to the year that you're projecting?
THE WITNESS (Fagan): Well, no. In each year as you look out ten years, you look out the next ten years. Then you look out the next ten years, and as you do that, as they've done that, each time they look out the next ten years their projection comes down.
MR. RAY: But the curve is always either flat or slightly up?
THE WITNESS (Fagan): Until -- we're right of the cusp. In this year the projection was 0.17 percent, which is pretty close to flat. You -- you can see in that --

MR. RAY: But it's not declining. Right?

THE WITNESS (Fagan): It's --

MR. RAY: It's not declining?

THE WITNESS (Fagan): It's not declining, but as I said before --

MR. RAY: You don't need to repeat yourself. There's not a question pending. Thank you.

Let's talk a little about winter reliability, if we can. If you turn to page 9? Starting on line -- I'm sorry. I don't want to get ahead of myself.

Starting on page 16, it says, the New England region has plentiful winter capacity reserves in excess of 50 percent, for a system that needs 15 percent. Did I read that correctly?

MR. BERMAN: I think you may have misspoken about the page before. You were talking about page 16 of the --

MR. RAY: Page 9, line 16. Did I say page 16, line 9? Sorry about that.

THE WITNESS (Fagan): Yes, that's -- that's correct. I think you read that right.

MR. RAY: Now one of the concerns with respect to winter reliability is more about fuel availability and less about overall capacity. Correct?

THE WITNESS (Fagan): Not one of the concerns, that's the concern. It's about fuel. It's not about overall capacity.

MR. RAY: Now if you go back to Mr. van Welie's September 28th presentation, would you go over to page 5? Do you see that? Are you on page 5?

THE WITNESS (Fagan): Yes.

MR. RAY: Okay. In the last bullet it says, for a number of reasons our operating situation is precarious during wintertime and we are concerned that beyond 2019 it may become unsustainable during extreme cold conditions. Did I read that correctly?

THE WITNESS (Fagan): Yes, you did.

MR. RAY: And one of the reasons is that, as he states above, that very little pipeline gas is available to support gas generators under extreme cold conditions. Right?

THE WITNESS (Fagan): I think it's fair to say that that's one of the reasons. He

says that in the last bullet, but I don't want to, you know, claim to understand how he makes his linkages across the table.

MR. RAY: And it's fair to say that one of the reasons is there's, at times little pipeline gas is available in the wintertime, is more gas is consumed for things like residential use and other higher priority uses, leaving less natural gas for the electricity sector. Right?

THE WITNESS (Fagan): You used the phrase, during the wintertime. His first bullet is, during extremely cold periods. So I just don't want to lose sight of the fact that gas is generally available throughout most of the winter. It's only during very cold periods when you -- when you don't have it.

MR. RAY: Okay. Fair enough. And the concern is that during these very cold periods, is the ability of natural gas-fired powerplants to generate electricity if their gas supply is curtailed. Right?

THE WITNESS (Fagan): Well, no. The concern is, do we have enough fuel of those plants that don't have gas in order to keep the lights on? Do we have enough oil, or LNG, or coal

plants?

MR. RAY: That's because the natural gas plants aren't going to be firing. Correct?

THE WITNESS (Fagan): Well, that's -- that's correct. That's their concern --

MR. RAY: I'm trying to be as efficient as possible, Mr. Fagan. And I would just ask if you would please just listen to my questions. Okay? I think I'm entitled to answers to my questions.

Now if the plants -- powerplants with interruptible gas supplies are the ones that might be at risk at a time like very cold periods. Correct? At risk of not operating?

THE WITNESS (Fagan): That's a fair statement.

MR. BERMAN: Was the question in reference to plants that lack --

MR. RAY: That's interruptible gas supplies.

MR. BERMAN: Right, but is that also assuming that the plants lack a secondary fuel?

MR. RAY: I will get to that next.

MR. BERMAN: All right. Fair enough.

MR. RAY: So to Mr. Berman's point, if those with interruptible gas supplies are not dual-fuel facilities they won't be available to generate electricity. Correct? During these extreme cold conditions?

THE WITNESS (Fagan): If during the extreme cold condition the gas is not available even though they're interruptible, that's -- that's true.

MR. RAY: Okay. Now Killingly is a dual-fuel facility. Right?

THE WITNESS (Fagan): Right, as are many other units in New England.

MR. RAY: Now on page 9 of your testimony starting on line 17 -- I'll give you a minute to get there.

It says, the region has taken various steps to ensure sufficient fuel availability to the existing asset base to ensure winter reliability, thousands of megawatts of which are equipped with dual-fuel capability. Did I read that right?

THE WITNESS (Fagan): That's

correct.

MR. RAY: Now not all those dual-fuel facilities use natural gas as their primary fuel. Correct?

THE WITNESS (Fagan): That may be true. There may be units that are oil as their primary fuel. That's possible.

MR. RAY: And you would expect that those that are not using natural gas as a primary fuel would already be dispatched during these periods of natural gas shortages. Right? Assuming they have their primary fuel?

THE WITNESS (Fagan): Possibly, depending upon what the load is, depending on what the merit order looks like. Yeah, there are instances when a lot of oil plants are -- are turned on in advance or committed in advance if they're forecasting an extreme cold snap period.

MR. RAY: And you also refer to some of these other steps. Those are generally referred to as the ISO New England winter reliability program. Right?

THE WITNESS (Fagan): The first portion of this, yes. The various steps to ensure sufficient fuel availability is just that.

MR. RAY: And one of those things is incentives to ensure that these generators fueled by oil or liquified natural gas secure fuel supplies before the winter heating season. Right?

THE WITNESS (Fagan): That's correct.

MR. RAY: And the program may compensate them for unused fuel at the end of the season. Right. Isn't that how it works generally?

THE WITNESS (Fagan): Yeah, subject to check I'm not familiar with all the details, but that the general --

MR. RAY: And that's a cost that's borne by the ratepayers --

THE WITNESS (Fagan): -- parts of it. Excuse me?

MR. RAY: That's a cost that's borne by the ratepayers. Correct?

THE WITNESS (Fagan): Yes, as with all costs of electric generation in New England ratepayers eventually pay.

MR. RAY: Last topic. I want to talk a little bit about greenhouse gas emissions. And if you look at page 8, again of your direct

testimony, right up there at the top starting on line two. You said the proposed KEC plant would annually emit 1.8 million metric tons of CO2 pollution. Do you see that?

THE WITNESS (Fagan): I do see that.

MR. RAY: Okay. And then in a footnote you refer to page 95 of NTE's application. Right?

THE WITNESS (Fagan): Yes.

MR. RAY: And that 1.8 million short tons is from the DEEP air permit application. Right?

THE WITNESS (Fagan): Sure. That sounds reasonable.

MR. RAY: Okay. And you understand that to be a potential to emit number?

THE WITNESS (Fagan): If I could look at the page of the application, please?

MR. BALDWIN: Do you have the narrative?

MR. RAY: Yeah, page 95. At least that's what's referenced in the footnote.

THE WITNESS (Fagan): Yes, the table says, KEC annual potential emissions.

MR. RAY: And are you familiar with the assumptions that were made in calculating that potential to emit figure?

THE WITNESS (Fagan): Not in detail. I presume the emission rate was multiplied by the megawatt hour, annual megawatt hour number.

MR. RAY: When you say, annual, that's based on operation, 8,760 hours per year, which is 24/7/365. Correct?

THE WITNESS (Fagan): 8760 is 24/365, yes. I don't know if this number -- I don't know what annual capacity factor or level of operation this specific number is associated with.

MR. RAY: So you don't know whether or not --

THE WITNESS (Fagan): I presume that it was associated with the full operation of the plant.

MR. RAY: Okay. So if it's full operation of the plant that's 24/7/365 for purposes of the air permit application. Right?

THE WITNESS (Fagan): Yeah, it -- the actual, you know, the actual information on how frequently the plant operates could be

different than that number. Sure. I'll -- I'll go back to your original question and say, yes. It's my understanding that it's the annual potential emissions, and I don't know specifically what average annual capacity factor that number might be tied to.

MR. RAY: So when you say, the plant will annually emit 1.8 million metric tons of CO2 pollution, you don't know under what conditions that scenario could come from?

THE WITNESS (Fagan): That's correct. I'd have to do the math. Subject to check, I could.

MR. RAY: Now on page 67 of your direct testimony?

THE WITNESS (Fagan): Yes.

MR. RAY: Line 4, you note that in 2013 total GHG emissions in Connecticut were between 41 and 43 million metric tons, and the electric power sector produced 7.4 to 9.5 million metric tons in 2013. Did I read that correctly?

THE WITNESS (Fagan): Yes, that's correct.

MR. RAY: Now those figures don't

assume that every combustion turbine is operating 24 hours a day, 365 days a year. Correct?

THE WITNESS (Fagan): Certainly not if they're actual data.

MR. RAY: Do you know if the figures you put in there are actual data?

THE WITNESS (Fagan): Yes, I believe they are actual data coming from the citations that I have listed here from the Connecticut DEEP, the Connecticut greenhouse gas emission inventory. So I presume that that inventory is actual data.

MR. RAY: Right. So it would not presume 24/7/365 day operations of these powerplants?

THE WITNESS (Fagan): For a CT, or probably even for CCs, yes, that's correct.

MR. RAY: Those would be anywhere from 35 to 60 percent capacity factors?

THE WITNESS (Fagan): Which? The CCs?

MR. RAY: You threw out both.

THE WITNESS (Fagan): CCs will be higher than CTs. Depending on the vintage and the location there's a wide range.

MR. RAY: Just for the record, CCs being combined cycle. CT is being combustion turbine?

THE WITNESS (Fagan): Yes.

MR. RAY: Thank you. So the KEC figure you use of 1.8 million tons is potentially very different in terms of the underlying assumptions than the Connecticut total figures that you cite from the DEEP report?

THE WITNESS (Fagan): The 1.8 million metric tons that I cite for KEC from the application may actually just be just a maximum potential. That number might be lower. If you operate at some number less than something that's reflected in the table on page 94 and 95 of the application, then that number would be lower than 1.8 million metric tons.

MR. RAY: And do you know if that figure in the application that generates the 1.8 million metric tons also includes 720 hours per year of operation on ULSD?

THE WITNESS (Fagan): I don't know.

MR. RAY: And then over on table 10 on page 68 you provide figures for the megawatt hours produced in 2015 by a number of

combined-cycle facilities. Right?

THE WITNESS (Fagan): Yes, that's correct.

MR. RAY: And those are probably actual numbers. Am I correct?

THE WITNESS (Fagan): Those are actual numbers from the EIA data, yes.

MR. RAY: And at the bottom of that table you have several facilities that will coming online shortly. Right?

THE WITNESS (Fagan): That may be coming online.

MR. RAY: Fair enough?

THE WITNESS (Fagan): Some of them more likely than others. And yes, I just made an assumption to put a number in there.

MR. RAY: All right. And for those new facilities you assume a 50 percent capacity factor in projecting energy output. Right?

THE WITNESS (Fagan): Yes, that's -- that's correct.

MR. RAY: Okay. So for those plants you don't assume they'll be firing 24/7/365. Right?

THE WITNESS (Fagan): No, for the

purpose of this table that's correct.

MR. RAY: Now you talk about economic studies in the footnote 100, which is over on page 65 -- excuse me, 70 of your direct testimony?

THE WITNESS (Fagan): Yes, that's correct. I'm referring to ISO New England's studies.

MR. RAY: All right. And then you provide what you refer to as a selection of key pages from the studies in Exhibit 16. Right?

THE WITNESS (Fagan): That's correct.

MR. RAY: Those studies evaluate five different resource mix scenarios?

THE WITNESS (Fagan): That's correct, yes.

MR. RAY: And you highlight scenario 3 over on page 72 as the only way to meet the proposed RGGI targets. Right?

THE WITNESS (Fagan): I don't think I used the word "only," but let me check.

MR. RAY: You may not have. That was perhaps my shorthand.

THE CHAIRMAN: Excuse me. I'm just

trying to get a sense of how much longer?

MR. RAY: I am hoping five minutes, five to ten minutes.

THE CHAIRMAN: I like the former. I was wondering if we need to take a break.

MR. RAY: I should be brief, yeah.

THE CHAIRMAN: But if we could keep this moving, thank you.

MR. RAY: Now just for the record, what Attorney Baldwin is handing out is pages 21 to 23 of the draft results, part 2. I don't believe these were provided in the key pages that you attached to your testimony. So I just wanted to supplement that.

Now on page 21 it talks about results and observations, and talking about capacity factors. Correct?

THE WITNESS (Fagan): That's correct.

MR. RAY: If you look on page 23 it states that even in scenario 3 generation from combined-cycle units is needed year round to meet load. Do you see that?

THE WITNESS (Fagan): Yes, I see that.

MR. RAY: And it also states on the same page that newer NGCC, and I assume that's natural gas combined cycles, reduced the runtimes of older, less efficient units. Correct?

THE WITNESS (Fagan): Yes.

MR. RAY: And then over on page -- flipping back to page 22, it states at the top the addition of renewable resources decreases the annual capacity factor of fossil units. Right?

THE WITNESS (Fagan): Yes, it states that.

MR. RAY: Okay. So even under scenario three this assumes that many natural gas fired units are needed to provide capacity. They'll just have a lower capacity factor than the other scenarios. Correct?

THE WITNESS (Fagan): I think that's what the modeling reflects, yes. It doesn't necessarily reflect many combined-cycle units are needed. It reflects operation of many combined-cycle units per the input assumptions for this modeling exercise.

MR. RAY: Okay. Fair enough. And then on page 74, starting on line 15, you note that Connecticut DEP categorizes the greenhouse

gas emissions in the 7 different sectors, electric power, transportation, agriculture, residential commercial industrial, and waste. Right?

THE WITNESS (Fagan): Yes, I'm aware of that characterization.

MR. RAY: And one of the things they talk about on page 74 to 75 is that mitigation measures in the transportation sectors may include a transition to electric cars. Right?

THE WITNESS (Fagan): Yes, that's right.

MR. RAY: So if all of those cars and trucks transition to electricity you'd expect significant greenhouse gas reductions in the transportation sector. Right?

THE WITNESS (Fagan): Yes, that's correct.

MR. RAY: But on that scenario the demand on the electricity sector would increase. Right?

THE WITNESS (Fagan): It would increase somewhat, yes, depending upon the penetration level of the electric vehicles.

MR. RAY: How much they're able to convert?

THE WITNESS (Fagan): Yeah.

MR. RAY: Okay. So there's no allocation of greenhouse gas emissions between these seven sectors. Right? In other words, there's nothing that says each one has to get down 80 percent. You may get more significant reductions in the transportation sector, but you may increase demand a little bit on the electricity sector?

THE WITNESS (Fagan): Yeah, I think it depends on what the -- what the policies are going forward. If they -- if they aim for and implement a least-cost policy they'll hopefully try to get reductions from least cost per greenhouse gas emission reduction first.

MR. RAY: Now on figure -- finally on figure 13 on page 77 of your report, you show electricity generation by various resources over time. Correct?

THE WITNESS (Fagan): Yes, that's correct.

MR. RAY: And in the 2015 time horizon, if I'm reading this correctly, that's over 50 percent and the electricity generated would come from solar. Correct?

THE WITNESS (Fagan): This is for Connecticut, yes. That's what this graph shows.

MR. RAY: And you don't present any data about the cost to achieve such a resource mix. Right?

THE WITNESS (Fagan): No, I'm just presenting the information from DEEP.

MR. RAY: And you also aren't presenting any information about the acreage or square miles that would be required to support that level of solar generation. Correct?

THE WITNESS (Fagan): No, I'm not presenting any information on the specific siting information. That's right.

MR. RAY: One moment.

THE CHAIRMAN: Yes, sir.

Mr. Lynch would like to have a follow-up question.

MR. RAY: I have nothing further, so thank you.

MR. LYNCH: Mr. Fagan, sometime during the afternoon of the last two hours, either in your question by the Chairman or Attorney Ray, it came to state or federal credits, tax credits, whatever. If -- I know some of them have already,

like, fuel cells have already expired and I know for wind and solar there's an expiration date I think at the end of this year.

If those aren't extended, what impact would that have on the renewables for solar and wind, and someone for development?

THE WITNESS (Fagan): It's not an easy question to answer. It's not the end of this year. It's the congress passed a law last year that phases them out, the credits for solar and wind between 2016 and 2020, so they -- so they ramp down.

The costs of the technologies separate from any subsidies have declined dramatically, and subsidy free are now approaching, or in some areas are at parity with wholesale generation. I would expect that the penetration of these resources nationwide, certainly in New England, will continue regardless.

Will the pace change? It's possible. There's probably a mix of factors. Will state policies change? If federal policy just does what it does they'll look and see what the costs look like around 2018, 2019, 2020 and

the states will have to make decisions about what sort of specific solar policies might be in place.

RPS policies, it's unclear to me that RPS policies will change much because of what's going on with tax credit type of policies, but the -- the overarching point is that the technologies' costs have been declining rapidly and subsidies have, you can argue, have helped to achieve such a cost to client.

And at some point soon the federal tax credits disappear, but there's -- and there's projections out there. I don't have numbers on them as to what might happen in the 2020s, but it will continue. There will be some sort of a hiccup, perhaps. Perhaps not. It depends. It depends on state policies and what happens over the next few years with the continuing cost declines for those technologies.

MR. LYNCH: Thank you, I was looking more for a comment than an answer to a question, anyhow. Thank you.

Mr. Chairman.

THE CHAIRMAN: Did you say you were finished?

MR. RAY: I'm done. Thank you very

much.

THE CHAIRMAN: We're going to ask just to see if Attorney Looney had any questions, but I don't see Attorney Looney.

Do I sense 30 seconds of redirect?

MR. BERMAN: I have thirty seconds of redirect.

Mr. Fagan, based on the most recent line of questioning about greenhouse gas emissions, if the greenhouse gas from the facility were one half of the 1.8 million tons per year that's referenced in your testimony, would this alter your analysis of the plant's consistency with Connecticut's climate goals?

THE WITNESS (Fagan): No, it would not.

MR. BERMAN: And I have one other question. You were asked some questions about -- if you turn to page 26, table 4 in your direct testimony -- tell me when you're there.

THE WITNESS (Fagan): I'm there.

MR. BERMAN: All right. Do you foresee a scenario in which 5,577 megawatts of generation retires in 2020 with no new generation coming into the system?

THE WITNESS (Fagan): No, I do not.
MR. BERMAN: Okay. I have no further questions.
THE CHAIRMAN: Yes, Mr. Harder?
MR. HARDER: A couple of questions on demand. The first, I guess, is simple. Do you know roughly in terms of when looking at the demand for electricity how much of that is related to electric lighting, roughly just ballpark?
THE WITNESS (Fagan): Between 40 and 70. I may be a little high. Maybe it's more like 30 to 60. There was a time when I could have given you the exact number. It's a significant fraction of the --
MR. HARDER: The other question is in determining demand, from what you know in determining demand in any particular year going forward over a period of time, could you describe the factors, the assumptions that go into determining demand?
I'm wondering how much -- is it assumed that people, either people, or industries, or organizations, or whatever that require electricity, is there an assumption that those users will adopt state-of-the-art, you know,

energy conservation methods or devices, electronics, you know, lighting, whatever, that uses state of the art? Or is there a certain percentage, or you know, a fraction lower over time?

You know, what assumptions are made to determine, you know, just how much the demand is going to be and how much it will increase or decrease over time?

THE WITNESS (Fagan): There are assumptions made about the level of energy efficiency going forward and the take up of the higher efficiency measures through, either improved grouping standards or through state energy efficiency programs.

ISO New England does an extensive process of forecasting energy efficiency every year, and it takes this into account. They do econometric analysis where they look back and they -- they try to parse the data looking back to see what their level of efficiency has been in the past, and they take that into account when they project forward.

So the short answer is, yes, they take that into account. It's a science, but it's

not perfect and part of that imperfection shows up in the fact that they're a little bit off as you -- as you go forward.

If you look at their projections from past years they tend to be a little bit high on load. But they do take that stuff into account and various other organizations, you know, parallel ISO New England's work, use different types of models, and use end-use models as opposed to econometric models to assess what load might look like in the future, splitting it up between residential, commercial/industrial sectors to try to capture trend differences across the sectors.

So a lot of people do put a lot of work into that forecasting to take into account what's the stock of efficiency in the -- in the appliances and in the lighting and the refrigeration and the motors, and what might -- how might that stop change over time. So they -- they do give it lot of attention. The forecast intends to reflect those changes.

MR. HARDER: I assume more or less by definition that's whatever state of the art is. There's always some number of steps ahead of what's actually happening on the ground?

THE WITNESS (Fagan): Yeah. I mean, what you find is there's a, you know, there's an adoption curve for technologies. And it took a while before people started putting in CFL, but eventually they did. And now we're going through the same process for LEDs.

Sort of on a different basis, the refrigeration equipment, motors, industrial process equipment has also improved over time in significant part due to federal and state and industry standards. And -- and the utility efficiency programs would also incent or rebate procurements of higher efficiency stuff.

So that feeds back into the cycle of, what's the efficiency of the stock that's available? And -- and over time the efficiency of -- across all the ideas, is it tends to creep up, because of the presence of the codes and standards and because of the feedback effects of the energy efficiency programs that sort of push the codes and standards to get better over time, so to speak.

MR. HARDER: Is it fair to try to quantify how far short we are at any point in time in terms of, you know, what's on the ground, what

we're doing in reality, versus kind of, you know, what the state of the art is in terms of energy efficiency appliances and that kind of thing?

THE WITNESS (Fagan): It is absolutely fair to try to quantify it. That that's what they do, the folks, you know, for example, at the California Energy Commission or the folks at the Connecticut, Massachusetts and Rhode Island energy efficiency advisory commissions are doing this quantification all the time in figuring out what their program designs should be, what their rebate levels should be.

At what point do they no longer give any rebates for CFLs because the market has absorb -- CFL costs have come down and we see that now. So it's absolutely fair to quantify, and that quantification goes on all over the place.

MR. HARDER: I guess a different way of asking the question is, is it fair of me to ask you to quantify it?

THE WITNESS (Fagan): Sure. We have to get specific. I mean, when I -- my focus for this testimony was at the level of New England. What's the requirement on the grid for

capacity? And -- and that number reflects a lot of things that have been happening with energy efficiency processes throughout all of New England.

Earlier I talked about, you know, one of the best things Connecticut could do would be to bump up its energy efficiency programs to attain the levels that Vermont, Rhode Island, and Massachusetts, California have -- have seen, you know, which might turn to a, you know, 50 percent or a doubling of the expenditures for energy efficiency in the state. And the folks who work on developing those programs quantify -- quantify the megawatt hours and the megawatts that would come out of such incremental spending.

So you know, at a high level you can look at the costs of saved energy from energy efficiency studies and you look at the spending of utility efficiency programs, which is just a portion of the cost. People pay a portion of the costs also directly, and you can do any kind of analysis that you want.

ISO New England takes all that data, and it turns into a net load forecast that you could use to assess where are we on the grid,

taking into account what's been going on, on the demand side New England-wise.

MR. HARDER: Thank you.

THE CHAIRMAN: Mr. Hannon has a question.

MR. HANNON: Yes, just one. Thank you.

This is sort of following up on some of your comments about how government -- well, I think you'd be state/federal making policies and how it could have an impact out there.

Based on a number of comments that have come out of the Washington DC area in the last couple of weeks, one of the things that it sounds like is some manufacturing companies in the US are complaining about the regulations that are associated with requiring them to meet certain efficiency requirements, and there's now talk about rolling back some of those regulations.

What impact would that have on the energy industry?

THE WITNESS (Fagan): It could slow down the growth of the availability of the most efficient units. So the stock could be -- the

trend of the stock increasing in overall efficiency over time might be perturbed, is what it amounts to.

DOE appliance efficiency standards have been around for a long time. There's been -- there's been a lot of changes. Different ministrations come and go and the standards get strengthened. They get weakened, or at least they don't get strengthened at the same pace that they have been being strengthened.

I don't think anything that comes out of Washington will -- will change the overall upward trend in increasing efficiency for the things that the federal government makes some language for.

THE CHAIRMAN: Okay. Attorney Looney, do you have any cross examination?

MR. LOONEY: I do not.

THE CHAIRMAN: The Council announces that it will continue the evidentiary session of this hearing at the offices here at 10 Franklin Square, here in Britain, on Thursday, January 26, 2017, at 11 a.m., this hearing room 1. Copies of the transcript of this hearing will be filed at the Killingly, Putnam and Pomfret Town

Clerk's offices. And I hereby declare this hearing adjourned. And thank you, all for your participation and drive home safely.

(Whereupon, the witnesses were excused and the above proceedings were concluded at 3:51 p.m.)

CERTIFICATE

I hereby certify that the foregoing 193 pages are a complete and accurate computer-aided transcription of my original verbatim notes taken of the Siting Council Hearing in Re: Docket No. 470, Application from NTE Connecticut, LLC for a Certificate of Environmental Compatibility and Public Need for the Construction, Maintenance, and Operation of a 550-Megawatt Dual-Fuel Combined Cycle Electric Generating Facility and Associated Electrical Interconnection Switchyard Located at 180 and 189 Lake Road, Killingly, Connecticut, which was held before ROBIN STEIN, Chairman, at the Connecticut Siting Council, 10 Franklin Square, New Britain, Connecticut, Tuesday, January 10, 2017.

_____

Robert G. Dixon, CVR-M 857

Notary Public

BCT Reporting, LLC

PO Box 1774

Bristol, Connecticut 06011

My Commission Expires: 6/30/2020

I N D E X

WITNESSES

Fred Sellars

George Logan

LYNN GRESOCK

Kevin Fowler

Mark Mirabito

Tim Eves

Chris Rega

Mike Bradley

Norm Thibealt

Scott Hesketh - Page 835

Robert M. Fagan - Page 901

EXAMINATION

Mr. Bashaw - Page 835

Mr. Looney - Page 885

Mr. Baldwin - Page 899

Mr. Berman - Page 901

Mr. Perrone - Page 902

Mr. Ray - Page 919