

BEFORE THE PUBLIC UTILITIES COMMISSION OF OHIO

- - -

In the Matter of the :
Application of Ohio Edison:
Company, The Cleveland :
Electric Illuminating :
Company, and The Toledo :
Edison Company for : Case No. 14-1297-EL-SSO
Authority to Provide for :
a Standard Service Offer :
Pursuant to R.C. 4928.143 :
in the Form of an Electric:
Security Plan. :

- - -

PROCEEDINGS

before Mr. Gregory Price, Ms. Mandy Chiles, and
Ms. Megan Addison, Attorney Examiners, at the Public
Utilities Commission of Ohio, 180 East Broad Street,
Room 11-A, Columbus, Ohio, called at 9:00 a.m. on
Thursday, October 29, 2015.

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VOLUME XXXV

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Thursday Morning Session,
October 29, 2015.

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EXAMINER PRICE: Let's go on the record.

Good morning. The Public Utilities
Commission has set for hearing at this time and place
Case No. 14-1297-EL-SSO, being In the Matter of the
Application of Ohio Edison Company, the Cleveland
Electric Illuminating Company and The Toledo Edison
Company for Authority to Provide a Standard Service
Offer pursuant to RC 4928.143 in the Form of an
Electric Security Plan.

My name is Gregory Price. With me are
Mandy Willey Chiles and Meghan Addison. We are the
attorney examiners assigned to preside over today's
hearing, which I believe is day XXXV of this
proceeding.

We will dispense with taking appearances
of the parties.

FirstEnergy, you may call your next
witness.

MR. KUTIK: Your Honor, for our last
rebuttal witness we call Judah L. Rose.

(Witness sworn.)

EXAMINER PRICE: Please be seated and

1 state your name and business address for the record.

2 THE WITNESS: Judah L. Rose. By business
3 address is 9300 Lee Highway, Fairfax, Virginia 22031.

4 MR. KUTIK: Your Honor, we ask to have
5 marked at this time as Company Exhibit 151, the
6 public version of the rebuttal testimony of Judah L.
7 Rose.

8 EXAMINER PRICE: It will be so marked.

9 (EXHIBIT MARKED FOR IDENTIFICATION.)

10 MR. KUTIK: We ask to have marked as
11 Company Exhibit 152 the confidential version of
12 Mr. Rose's rebuttal testimony.

13 EXAMINER PRICE: It will be so marked.

14 (EXHIBIT MARKED FOR IDENTIFICATION.)

15 MR. KUTIK: 152 Confidential. And we ask
16 to have marked as Exhibit 153 a document that we
17 circulated to the Bench and to the parties, which
18 indicates it's "Figure 9 (Corrected) EIA Gas
19 Prices-GHG Cases and Wilson Scenarios," as, again,
20 Exhibit 153.

21 EXAMINER PRICE: This is not
22 confidential?

23 MR. KUTIK: It is not confidential.

24 EXAMINER PRICE: It will be so marked.

25 (EXHIBIT MARKED FOR IDENTIFICATION.)

1 MS. FLEISHER: Your Honor, if this is a
2 fine time, I would like to raise a motion to strike.

3 MR. KUTIK: I haven't finished my direct
4 testimony, your Honor.

5 EXAMINER PRICE: Not yet. But I will
6 give you first shot at the motions to strike.

7 Please proceed, Mr. Kutik.

8 - - -

9 JUDAH L. ROSE

10 being first duly sworn, as prescribed by law, was
11 examined and testified as follows:

12 DIRECT EXAMINATION

13 By Mr. Kutik:

14 Q. Mr. Rose, do you have before you what's
15 been marked for identification as Company
16 Exhibit 151?

17 A. I don't have anything that's marked, but
18 I have my testimony.

19 Q. Okay. And that's the public version of
20 your testimony?

21 A. It's the confidential version.

22 Q. Okay. You recognize Exhibit 151 as the
23 public version of your testimony?

24 A. I do.

25 Q. And you have the confidential version of

1 your testimony before you?

2 A. I do.

3 Q. And that's been marked as Exhibit 152?

4 A. Yes.

5 Q. Do you have any additions or corrections
6 to make to your rebuttal testimony?

7 A. I do.

8 Q. And would those additions or corrections
9 be applicable to both the public and confidential
10 versions of your testimony?

11 A. Yes.

12 Q. Could you take us through those additions
13 or corrections, please.

14 A. Page 2, towards the middle of the Table
15 of Contents under the second C, where it says
16 "Mr. Comings' Capacity Prices Are Flawed," I want to
17 interject "V. Forecasting Natural Gas Prices." And
18 on the right side, page "28," on that same line.

19 On page 5, line 6, there is a question
20 mark at the end of line 6 after "prices."

21 Page 6, line 19, the word "decline"
22 should be "increased."

23 Q. You should delete the word "decline"?

24 A. Yes.

25 MR. FISK: I'm sorry, which page?

1 THE WITNESS: Page 6.

2 Q. Do you want to say the line number again?

3 A. Line 19.

4 Q. What's your next change?

5 MR. OLKER: I'm sorry. Was the change
6 to strike the word "decline"?

7 EXAMINER PRICE: And add the word
8 "increased."

9 MR. OLKER: Okay. Thank you.

10 Q. (By Mr. Kutik) What is your next change?

11 A. Page 23, line 12, the close parentheses
12 should be deleted and a comma inserted.

13 MR. HAYS: I'm sorry, could you do that
14 once more, sir?

15 THE WITNESS: Page 23, line 12, after the
16 word "load" there is a closed parenthesis. That
17 should be deleted and a comma inserted.

18 A. Page 28, line 15, the words "above the
19 ones" should be deleted.

20 On page 28, same page, line 18, there
21 should be a Roman numeral V and a period in front of
22 "Forecasting Natural Gas Prices."

23 Page 34, line 4, after the word "well" it
24 should be -- that word should be "wells," and after
25 that should insert a parenthetical "(See Figure 3)."

1 On the same page, line 13 at the bottom,
2 insert "Source: ICF International."

3 Page 54, line 18, Roman numeral V should
4 be a "D" as in David, "D" as in David.

5 Page 56, line 8, towards the end of the
6 line, the first word in that sentence that says
7 "Staring" should be "Starting." There is a "T"
8 missing.

9 Q. Now, Mr. Rose, let me direct your
10 attention to what's been marked as Company Exhibit
11 153, the Figure 9 corrected. What is that?

12 A. It's a correction to Figure 9 to the
13 bottom gray line which is marked "Wilson Scenario 3
14 (Forwards)."

15 Q. Should the figure that is shown in
16 Exhibit 153 be inserted for Figure 9 on page 44 of
17 your rebuttal testimony?

18 A. Yes.

19 Q. And what is the change in that gray line?

20 A. The gray line starting at year '23 is
21 increasing as opposed to being flat so we had a real
22 number in there rather than a nominal number and so
23 the correction is to the bottom gray line so now,
24 it's increasing in a monotonically years.

25 Q. In nominal dollars.

1 A. Yes.

2 Q. With the corrections that you've
3 discussed including the inclusion of the figure
4 that's in Exhibit 153, if I asked you the questions
5 that appear in your rebuttal testimony documents,
6 would your answers be the same?

7 A. Yes.

8 MR. KUTIK: Thank you, your Honor.

9 EXAMINER PRICE: Ms. Fleisher.

10 MS. FLEISHER: Thank you, your Honor. So
11 just to provide a little context, last Wednesday the
12 attorney examiners in this case held an informal call
13 with the intervenors, at which time I understood
14 Mr. Kutik to represent we should contact him with any
15 questions regarding sources of information in
16 Mr. Rose's testimony. The following day I sent an
17 e-mail to FirstEnergy's counsel CCing the parties and
18 attorney examiners requesting sources for 14 separate
19 items of information in Mr. Rose's testimony that
20 contains facts or data that appeared to be drawn from
21 some outside source but contained no citation or
22 reference for those.

23 The following day I sent an e-mail to
24 FirstEnergy's counsel CCing the parties and attorney
25 examiners requesting sources for 14 separate items of

1 information in Mr. Rose's testimony that contains
2 facts or data that appeared to be drawn from some
3 outside source but contained no citation or reference
4 for those.

5 At this point I have -- none of the other
6 parties have any way to know whether Mr. Rose
7 perceived this data, if he did, where it comes from.
8 We have not had an opportunity to do discovery to
9 determine the source or explore the context of this
10 data in depositions or written discovery, and I would
11 say that having the opportunity to do it only now on
12 cross-examination without a chance to go back and
13 explore the sources would cause prejudice to myself
14 and the other intervenors because it is basically no
15 chance at all.

16 EXAMINER PRICE: Do you have a copy of
17 what the request was so we at least know what you are
18 talking about?

19 MS. FLEISHER: Yes. It's marked up. I
20 have a copy of the e-mail, but I can also read it out
21 to you.

22 MR. KUTIK: Your Honor, I have a copy I
23 can share with the Bench.

24 EXAMINER PRICE: That would be fine.

25 MR. KUTIK: May I approach?

1 EXAMINER PRICE: Yes.

2 Mr. Kutik, care to respond?

3 MR. KUTIK: Yes, your Honor. There are
4 multiple problems with the motion to strike.
5 Specifically, your Honor, the real complaint is that
6 Ms. Fleisher didn't have an opportunity to do
7 discovery. That is well-trod ground at this point.
8 You've already ruled on their motion for -- our
9 motion for protective order, and you have already
10 ruled in terms of what discovery would be
11 appropriate, and the discovery, frankly, that the
12 companies had agreed to, which was the deposition of
13 Mr. Lisowski and the deposition of Mr. Rose.

14 In our conversation with you on
15 Wednesday, as you recall, I said I would be willing
16 to work with the parties if they were, obviously,
17 willing to work out our dispute.

18 As you know, your Honor, I believe -- I
19 am not sure which of the e-mails you received, but I
20 know you received several of them. Every one of our
21 proposals was rejected summarily by every one of the
22 other parties. They were not going to work with us
23 and so we were -- they were basically stuck with our
24 final proposal, which was the deposition of
25 Mr. Lisowski for two hours and the deposition for

1 Mr. Rose between 2 and 5 o'clock last Friday. That
2 was the deal.

3 I further said, your Honor, that I -- in
4 that conversation we had with you that I would not
5 want to be deluged with discovery requests. That if
6 there were specific issues, I would be willing to
7 entertain those, but I certainly didn't make any
8 commitments.

9 Your Honor, if you go through some of
10 these -- I am not suggesting you do, but if one were
11 to go through some of these requests, you could see
12 that this is basically an exercise in busywork
13 because nine of them -- nine of them are cited in the
14 materials. So this isn't a legitimate request. It
15 is more an effort to again complain that they haven't
16 gotten discovery and to try to make some kind of
17 basis to get either more discovery or something else.
18 I don't know. It isn't a legitimate position, in any
19 event.

20 Mr. Rose was available for deposition.
21 He could have been asked this. I would note, by the
22 way, Ms. Fleisher didn't indicate she had any
23 questions at the end of the deposition.

24 And so we are ready to have Mr. Rose be
25 subject to cross-examination. If Ms. Fleisher has an

1 issue with respect to Mr. Rose's ability to come
2 forth with the bases for this information, she can
3 certainly test Mr. Rose, who is widely regarded and,
4 frankly, is undisputed as one of the leading
5 authorities in the energy industry in the United
6 States in terms of where he gets his materials and
7 his ability to provide sufficient foundation for his
8 information that he has provided to the Commission
9 today.

10 EXAMINER PRICE: Ms. Fleisher?

11 MS. FLEISHER: Certainly, your Honor. In
12 terms of this being a request for more discovery, I
13 would say it's informed by the fact we haven't had
14 the chance to have discovery, but really it's just a
15 simple question of the fact that it's the burden is
16 on the companies to present testimony and evidence
17 consistent with Ohio's Rules of Evidence in this
18 Commission's precedence, which requires them to lay a
19 foundation.

20 They didn't -- You know, they didn't do
21 so in the written testimony, although apparently they
22 were capable of identifying at least the sources of
23 at least nine of the items and declined to provide
24 that information in response to my request. And, in
25 the context of this being rebuttal testimony, it's

1 simply an issue of causing prejudice to the
2 intervening parties to basically sandbag and say, oh,
3 no, no, we'll lay the foundation at the last minute.

4 I certainly, you know, tried to preserve
5 my rights. I participated in the deposition.
6 Mr. Kutik indicated the deposition was closing before
7 I had the opportunity to ask questions.

8 EXAMINER PRICE: Actually, I did look --
9 I have to say I did look at towards the end of the
10 deposition, and it did seem before he went on to -- I
11 think he had started with Sierra Club and then asked
12 Mr. Sauer if he had any questions, and then Mr. Sauer
13 said he would defer to Mr. Olikier, so I'm sorry you
14 got lost in the shuffle, but I can't say that it was
15 just the company because clearly, I think, the
16 impression I had was that you guys had worked out the
17 order of deposition, and that was why Mr. Olikier went
18 ahead of Mr. Sauer. Now, maybe that's just my
19 misapprehension from looking at the deposition.

20 MS. FLEISHER: I can tell you I did not
21 coordinate with other parties in terms of setting an
22 order for asking questions. I waited for a chance to
23 participate. I was conscious of the fact that with a
24 limited time for deposition, I didn't necessarily
25 think it was really appropriate for -- to have to

1 burn up, you know, who knows how long in the
2 deposition to go through items because the companies
3 had failed to provide any -- any reference or
4 citations supporting those items given the limited
5 time frame as opposed to substantive questions about
6 the -- about Mr. Rose's testimony.

7 And, again, I tried to informally work
8 this out outside the context of deposition. I'm not
9 sure why -- or whether Mr. Kutik has provided any
10 particular reason other than resenting having to do
11 the work why he couldn't have responded.

12 EXAMINER PRICE: It is going to be a long
13 day if we start saying "resenting" each other.

14 MS. FLEISHER: Okay. I will leave it at
15 that. I did reach out to Mr. Kutik. He did not
16 respond. I was not able to get this information
17 through deposition. This is my only avenue left, and
18 I believe it's inadequate.

19 EXAMINER PRICE: Thank you.

20 We are going to deny your motion to
21 strike. Again, the Commission rule does not provide
22 for written discovery after the commencement of the
23 hearing. There was a discovery cutoff except for
24 notice of deposition in this case, which was quite a
25 while ago, and so there was -- there is no

1 opportunity for written discovery.

2 It would have been great if the parties
3 had worked this out. I would have appreciated it,
4 but that didn't happen. Likewise, it would have been
5 great if the intervenors had better coordinated the
6 limited deposition time and given you a chance to ask
7 questions.

8 So any other motions to strike before we
9 start cross?

10 Having said that you can, of course, ask
11 him on cross his source for this information.

12 MS. FLEISHER: Okay. And, of course, I
13 would like to preserve my right to raise this in
14 briefs.

15 EXAMINER PRICE: Absolutely.

16 MS. FLEISHER: Thank you, your Honor.

17 EXAMINER PRICE: Any other motions to
18 strike at this time?

19 Okay. Mr. Fisk.

20 MR. FISK: Thank you, your Honors.

21 - - -

22 CROSS-EXAMINATION

23 By Mr. Fisk:

24 Q. Good morning, Mr. Rose.

25 A. Good morning.

1 Q. How are you doing today?

2 A. Good. How are you doing?

3 Q. Pretty good. It's the last day, so.

4 If we could start at page 60 of your
5 rebuttal testimony. Let me know when you are there.

6 A. I'm on page 60.

7 Q. Okay. And starting at lines 16, you
8 discuss the CO-2 projection of Mr. Comings and how it
9 could impact his natural gas and energy price
10 projections; is that correct?

11 A. Yes.

12 Q. Okay. And Mr. Comings assumed a carbon
13 price starting in 2020, correct?

14 A. Yes, sir.

15 Q. And your forecast in this proceeding also
16 assumed a carbon price starting in 2020; is that
17 correct?

18 A. A lower one, but I also had one.

19 Q. And we now know that the carbon price
20 would start in 2022; is that correct?

21 A. Yes. The CO-2 control program starts
22 January 1, 2022.

23 Q. Okay. And you are referring there to the
24 final Clean Power Plan; is that correct?

25 A. Yes, which is described in footnote 70.

1 Q. Yes. Okay. And on page 60 of your
2 rebuttal, line 22, you refer to Mr. Comings's CO-2
3 price as overly high; is that correct?

4 A. Yes. It's nine times -- it's higher.

5 Q. And the CO-2 price that Mr. Comings used
6 was calculated by ICF using EPA's assumptions as
7 parts of ICF's work for EPA on the Clean Power Plan;
8 is that correct?

9 A. Yes. It was ICF's implementation of
10 directions and instructions from EPA.

11 Q. Okay. And that ICF-calculated CO-2 price
12 that Mr. Comings recommended was for the draft Clean
13 Power Plan; is that right?

14 A. Yes.

15 Q. And it's your belief that that
16 ICF-calculated carbon price is too high; is that
17 right?

18 A. We know for a fact it's too high. It's
19 not my opinion.

20 Q. Because it starts in 2020 rather than
21 2022?

22 A. Right. Or the program starts in 2022,
23 and that's why we had the very low number for 2020,
24 and my issue is his number is higher, and we now know
25 it's zero because there's no program --

1 Q. Okay.

2 A. -- in that year.

3 Q. Okay. Is it your opinion for years where
4 there -- you do expect there to be a carbon price,
5 the ICF-calculated carbon price for the draft Clean
6 Power Plan is too high?

7 A. The -- the set of numbers that
8 Mr. Comings is referring to, on average, is similar
9 to the ICF number. It's much higher in 2020 and has
10 a different year-by-year pattern, significantly
11 different year-by-year pattern, but, on average, it's
12 similar.

13 Q. Okay. And when you say it's similar to
14 the ICF number, you're referring to the ICF number
15 you used in this proceeding?

16 A. That's correct.

17 Q. Okay. And ICF has calculated multiple
18 CO-2 prices for the final Clean Power Plan using
19 EPA's assumptions, correct?

20 MR. KUTIK: May I have the question read,
21 please.

22 EXAMINER PRICE: You may.

23 (Record read.)

24 A. Yes. I just want to make sure it's clear
25 when you say "assumptions," there is a whole set of

1 assumptions and instructions that we're receiving,
2 and we are implementing those instructions as per our
3 contract with EPA.

4 Q. Okay. And you would not use the CO-2
5 price that is ICF calculated for the final Clean
6 Power Plan in any of your own forecasting, correct?

7 A. No. It turns out the average is similar
8 but I would not use the -- that set of numbers.

9 Q. Okay. So the numbers that ICF calculated
10 for the final Clean Power Plan you would not use?

11 A. No. It's not for this type of analysis.

12 Q. Okay. And looking back at your rebuttal
13 testimony on page 60, lines 6 through 14, you have a
14 discussion there regarding Mr. Comings below that
15 there will be higher CO-2 prices, which, all things
16 being equal, would raise gas prices; is that correct?

17 A. Yes.

18 Q. Okay. And so you're critiquing
19 Mr. Comings in part for relying on EIA's 2014 AEO gas
20 price forecast that did not include a carbon price,
21 while at the same time urging use of a higher carbon
22 price; is that right?

23 A. Higher than zero. He was using zero in
24 all years, and I said he should use a number greater
25 than zero.

1 Q. Okay. Because in order to -- because he
2 is using an EIA gas price forecast, it didn't include
3 carbon, correct?

4 A. That's correct, yes.

5 Q. Okay. And it's your testimony, am I
6 correct, that Mr. Comings should have increased the
7 EIA gas price projection to account for a CO-2 price?

8 A. Yes.

9 Q. And that's because it's your opinion
10 that, all else equal, a price on CO-2 emissions would
11 have an upward impact on natural gas prices; is that
12 right?

13 A. Under most reasonable assumptions, that
14 would be the effect, and when you raise the gas
15 prices, there's also the -- it doubles the effect of
16 those two pathways for which the CO-2 is raising the
17 electrical energy forecast. It's directly affecting
18 the marginal costs and it's also affecting gas
19 prices, and he was coming up with a lower electrical
20 energy price, and that was the problem.

21 MR. FISK: Your Honor, I would move to
22 strike the portion of that question dealing with
23 electrical energy prices. I was asking about
24 relationship between carbon prices and gas prices.

25 EXAMINER PRICE: We are going to grant

1 the motion to strike.

2 Mr. Rose, we would like to get you up and
3 down as quickly as we can. If you could listen
4 carefully to counsel's question, that will expedite
5 matters immensely. Thank you.

6 THE WITNESS: Thank you, your Honor.

7 MR. FISK: Thank you, your Honors.

8 Q. (By Mr. Fisk) So if you are comparing two
9 gas price forecasts for a particular year, you would
10 want to ensure that both forecasts either include a
11 CO-2 price or do not include a CO-2 price; is that
12 correct?

13 A. That would be an important contribution.
14 I would like to know what the assumptions were for
15 the CO-2 when I am assessing whether or not the gas
16 prices are reasonable.

17 Q. Okay. Okay. And with the caveat of the
18 EIA forecast not including a carbon price, am I
19 correct you otherwise believe that EIA's 2014 AEO's
20 natural gas price forecast is reasonable?

21 A. I think it's -- yes, I think it overall
22 reasonable in the sense it has reasonable
23 methodology. Turns out the number is pretty similar
24 to mine. It's not the number I would use, but it's a
25 reasonable approach.

1 Q. Okay. And if you could turn to page 44
2 of your testimony.

3 MR. KUTIK: His rebuttal testimony?

4 MR. FISK: Rebuttal, yes.

5 Q. And if we could -- Mr. Rose, if we could
6 agree if I refer to your testimony, I am referring to
7 your rebuttal, unless I say otherwise?

8 A. I have been so advised.

9 Q. Okay. Are you on page 44?

10 A. Yes, sir.

11 Q. Okay. And there's a Figure 9 there. Do
12 you see that?

13 A. Yes, sir.

14 Q. Okay. And earlier this morning there was
15 also marked a Company Exhibit 153. Do you recall
16 that?

17 A. Yes, sir.

18 Q. Okay. And that provides a corrected
19 version of Figure 9; is that right?

20 A. Yes, sir.

21 Q. And is the only change between the Figure
22 9 in your rebuttal testimony and the Figure 9 on
23 Company Exhibit 153 is that the Wilson Scenario 3
24 forwards prices are different?

25 A. Yes.

1 Q. Okay. So none of the other lines in
2 Figure 9 change between your testimony and the
3 Company Exhibit 153, correct?

4 A. Yes.

5 Q. Okay. And Figure 9 the -- the light
6 orange line, which is Wilson Scenario 1, that is the
7 EIA's AEO 2014 base case that we were discussing a
8 minute or two ago; is that correct?

9 A. Yes, sir.

10 Q. Okay. And so for 2015 you are reporting
11 that EIA's projected natural -- Henry Hub natural gas
12 prices to be just under \$4 per million BTU; is that
13 right?

14 A. Yes. I mean very close to \$4.

15 Q. Okay. And EIA's 2015 AEO natural gas
16 price forecast is similar to the 2014 one; is that
17 right?

18 A. For a long term average it's within a
19 percent. The long term average of 2014 and 2015 are
20 within a percent of each other.

21 Q. Okay.

22 A. On average.

23 Q. And are you aware that EIA reports actual
24 Henry Hub natural gas prices?

25 A. Yes.

1 Q. Okay.

2 MR. FISK: Your Honor, may we approach?

3 EXAMINER PRICE: You may.

4 MR. FISK: If we can mark this document
5 as Sierra Club Exhibit 85.

6 EXAMINER PRICE: It will be so marked.

7 (EXHIBIT MARKED FOR IDENTIFICATION.)

8 Q. Mr. Rose, you have been handed a document
9 that's been marked as Sierra Club Exhibit 85. It is
10 "US EIA's Natural Gas Henry Hub Spot Prices" on a
11 daily basis. Does that appear to be correct?

12 A. It so appears, yes.

13 Q. Okay. And have you ever seen -- have you
14 ever consulted this website regarding Henry Hub
15 natural gas spot prices?

16 A. I personally have not on a daily basis,
17 no.

18 Q. Have you ever, not on a daily basis, but
19 ever in your work?

20 A. I don't remember looking at this
21 particular dataset. I look at natural gas prices,
22 but not -- I don't recall looking at this daily EIA
23 source.

24 Q. Okay. If you could turn to page 16 of
25 17.

1 A. Yes, sir.

2 Q. Okay. Are you generally aware of
3 where -- of actual Henry Hub natural gas spot prices
4 so far in October of 2015?

5 A. Yes.

6 Q. Okay. And do the numbers -- strike that.
7 Towards the bottom of page 16 of this
8 exhibit, does it report Henry Hub natural gas spot
9 prices for October 1 through October 26?

10 MR. KUTIK: Objection.

11 EXAMINER PRICE: Grounds?

12 MR. KUTIK: Foundation. He said he
13 hasn't seen this, doesn't look at this.

14 EXAMINER PRICE: I understand, but I
15 think that there is sufficient indicia of reliability
16 that he can go ahead and answer this question.

17 Q. Do you need the question back?

18 A. Please.

19 MR. FISK: Could you read it back.

20 (Record read.)

21 A. It appears to, yes.

22 Q. Okay. And are the numbers reported for
23 those days in October listed on this exhibit
24 consistent with your understanding of where Henry Hub
25 natural gas spot prices have been in October of 2015?

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1 A. Yes, in a general way. I don't have each
2 individual day memorized, three digits.

3 Q. Okay. Okay. And are you aware as to
4 whether EIA has issued any natural gas price
5 forecasts for 2016 that are more recent than what was
6 included in the EIA AEO's 2015 document?

7 A. Not long-term prices, which is the focus
8 of my analysis, but the last long-term analysis was
9 April, 2015.

10 Q. Okay. But my question was for any
11 forecast for 2016.

12 A. Yes, I believe they have.

13 Q. Okay. And have you seen such forecasts?

14 A. Yes.

15 Q. Okay. And are you aware that EIA issues
16 short-term energy outlooks on a monthly basis?

17 A. I know they issue short-term outlooks.

18 MR. FISK: Your Honor, may we approach?

19 EXAMINER PRICE: You may. I'm guessing
20 this is an EIA short-term outlook.

21 MR. FISK: Good guess.

22 EXAMINER PRICE: Which date?

23 MR. FISK: It is an "October 6, 2015,
24 Short-Term Energy and Winter Fuels Outlook." It's
25 the natural gas section of that document.

1 EXAMINER PRICE: We'll mark that as
2 Sierra Club 86.

3 MR. FISK: Thank you. Your Honor.

4 (EXHIBIT MARKED FOR IDENTIFICATION.)

5 Q. (By Mr. Fisk) So, Mr. Rose, you have been
6 handed a document marked Sierra Club Exhibit 86
7 titled U.S. EIA "Winter Fuels Outlook"; is that
8 correct?

9 A. Yes, sir.

10 Q. And I know you saw this at least at your
11 deposition, correct?

12 A. I saw it at my deposition and I indicated
13 I hadn't reviewed it, but I did see it at my
14 deposition.

15 Q. Okay. And have you reviewed it since
16 your deposition at all?

17 A. A little bit, not a lot.

18 Q. Okay. If you could turn to page 3 of
19 this document, about two-thirds of the way down the
20 page there is a header that says "Natural Gas
21 Prices." Do you see that?

22 A. Yes, sir.

23 Q. Okay. And the first paragraph under that
24 header, the last sentence says, "The projected Henry
25 Hub natural gas price averages \$2.81/MMBtu in 2015

1 and \$3.05/MMBtu in 2016." Do you see that?

2 MR. KUTIK: Objection.

3 EXAMINER PRICE: Grounds?

4 MR. KUTIK: Foundation.

5 EXAMINER PRICE: He indicated since his
6 deposition he has reviewed it some, the document to
7 some extent, not a lot, but to some extent.

8 MR. FISK: Thank you, your Honor.

9 EXAMINER PRICE: Overruled.

10 A. I do see the sentence that you read.

11 Q. Okay. And the \$3.05 cents per million
12 BTU price for 2016, is that consistent with your
13 understanding of EIA's current forecast of Henry Hub
14 natural gas prices for 2016?

15 A. Yes. In my experience their forecasts
16 are very similar to the then-current futures price
17 for the short term.

18 Q. Okay. And when you say "the current
19 future price," are you referring to the NYMEX
20 futures?

21 A. Yes, for the short-term forecast, so it
22 pretty much tracks that.

23 Q. Okay. And so it's your understanding
24 that the NYMEX futures for natural gas for 2016 are
25 in the \$3.05 per million BTU range?

1 A. They have been recently roughly in that
2 range, plus or minus 10 or 20 cents. They have been
3 moving throughout the year.

4 Q. Okay. And when you say "they have been
5 recently," how recently do you mean?

6 A. They have been moving all year. I mean,
7 my projection was based on a futures price, and EIA,
8 as I said, indicate -- generally starts with a
9 projection of the futures price. It turned out that
10 that futures price in the course of the last year
11 turned out to be too high, so the futures price
12 itself is moving and is not necessarily tracking the
13 volatility on an annual basis.

14 Q. And the future price now is approximately
15 around 30 percent lower than the future prices you
16 used in your projection; is that correct?

17 A. Right. Over the course of the year, the
18 futures price itself moved for the short-term of
19 30 percent approximately, roughly. So, you know,
20 even the futures price shows how volatile the short
21 term can be.

22 Q. If you could turn to page 54 of your
23 testimony, starting at the end of line 9 through line
24 13, you have a reference to I guess whether future
25 prices provide useful information. Do you see that?

1 A. Yes, sir, I see that.

2 Q. And so it's your testimony they provide
3 useful information for the prompt two years; is that
4 right?

5 A. That's part of my testimony. I mean, I
6 think the way it's written here is the best way to
7 describe it, but the first two years we used the
8 futures I forecast -- I input into my model in 2014
9 the futures from April or May of 2014. It turned out
10 that the futures are high compared to what's
11 happening right now, so they, themselves, are subject
12 to the same vol -- short-term volatility. But I do
13 think it's reasonable to use the futures for the
14 first two years. Beyond that, it becomes less and
15 less reasonable.

16 MR. FISK: Could I have that answer read
17 back?

18 EXAMINER PRICE: You may.

19 MR. FISK: Thank you.

20 (record lead.)

21 MR. FISK: Your Honor, I would move to
22 strike the portion where he starts talking about the
23 numbers he actually used and the volatility. I was
24 simply asking whether it's reasonable to use the
25 first two years of futures, not a discussion about

1 volatility of natural gas prices.

2 EXAMINER PRICE: I understand. But you
3 were just accepting a portion of one sentence out of
4 his testimony as explaining -- to try to explain that
5 portion in context. But if you want to follow-up
6 with a "yes" or "no" answer. I will make him answer
7 "yes" or "no."

8 MR. FISK: Okay. Thank you, your Honor.

9 Q. (By Mr. Fisk) Okay. So for the first two
10 years, it's -- you would agree it's appropriate to
11 use natural gas futures in your forecasting; is that
12 right?

13 A. Yes. That's what I do.

14 Q. Okay. And then you would not use futures
15 for years three and beyond; is that correct?

16 A. I do not, that's correct. I use my
17 fundamentals forecast once we starting getting beyond
18 two years.

19 Q. And is it your opinion it's unreasonable
20 to use futures beyond year two?

21 A. I would not do it, and I certainly
22 wouldn't do it for the long term.

23 Q. Okay. All right. Going back to Figure
24 9, you did not provide any sort of workpaper or
25 professional spreadsheet that would identify the

1 specific values for the various natural gas price
2 forecasts identified on Figure 9, correct?

3 MR. KUTIK: We are talking about Figure 9
4 corrected?

5 MR. FISK: Yes.

6 EXAMINER PRICE: Unless otherwise
7 indicated, we are talking about Figure 9 corrected.

8 A. I did not provide a spreadsheet.

9 Q. Okay, okay. So there's two scenarios
10 identified on Figure 9, one labeled GHG10 and one
11 label GHD25. Do you see that?

12 A. Yes, sir, I do.

13 Q. Okay. And am I correct the GHG10
14 scenario is in the 2014 EIA AEO. The EIA ran a
15 scenario in which it assumed a \$10 per ton carbon
16 price?

17 A. It was in that scenario they assumed \$10
18 real with a -- so it's escalating with general
19 inflation, plus an additional 5 percent escalation,
20 and starts in 2015.

21 EXAMINER PRICE: Let's go off the record
22 for a second.

23 (Discussion off the record.)

24 EXAMINER PRICE: Let's go back on the
25 record.

1 Please proceed, Mr. Fisk.

2 MR. FISK: Okay. Thank you.

3 I'm sorry. Could I have the last
4 question read back? I just can't recall what my last
5 question was.

6 EXAMINER PRICE: Yes, yes.

7 (Record read.)

8 EXAMINER PRICE: Thank you.

9 Complete your answer, Mr. Rose.

10 MR. KUTIK: Can we have the answer read
11 to see if he answered it?

12 EXAMINER PRICE: We can.

13 (Record read.)

14 A. Yes, I completed it. I believe it's -- I
15 believe it's 2011 or 2012 dollars, so it's real and
16 particular, your dollars. Even by 2015 it's going to
17 be above \$10.

18 Q. Okay. And am I correct that this AEO
19 scenario that we were discussing, the \$10 was in
20 metric tons; is that right?

21 A. That's also correct, yes.

22 Q. Okay. And your forecast for carbon
23 prices are in short tons?

24 A. Yes, that's correct.

25 Q. Okay. And the conversion from metric

1 tons to short tons is approximately .9?

2 A. Yes. You multiply the metric ton by .9
3 or divide by 1.1.

4 Q. So a \$10 per ton -- per metric ton price
5 would be equivalent of approximately \$9 per ton for
6 short tons?

7 A. Yes. That is part of the conversion, and
8 then there is the real to nominal escalation, plus
9 the 5 percent on top of that. So with that caveat,
10 there is a lot of adjustments you have to make.

11 Q. Okay. And so could we agree, without
12 revealing any of your confidential numbers, that the
13 carbon price used in the GHG10 scenario by EIA is
14 significantly higher than your carbon price?

15 A. Yes, I think we can agree to that.

16 EXAMINER PRICE: Go off the record.

17 (Recess taken.)

18 EXAMINER PRICE: Let's go back on the
19 report.

20 Mr. Fisk, you may proceed.

21 MR. FISK: Thank you, your Honor.

22 Q. (By Mr. Fisk) Okay. Mr. Rose, before the
23 short break I believe we were talking about corrected
24 Figure 9 and the EIA GHG10 gas price scenario. Do
25 you recall that?

1 A. Yes, sir, I do recall.

2 Q. Okay. And I believe you stated before
3 the break that in the EIA GHG10 scenario, the carbon
4 price there started in 2015; is that right?

5 A. Yes.

6 Q. Okay. So there would be a carbon price
7 in every year of 2015 through 2030 of the EIA GHG10
8 forecast; is that right?

9 A. Yes. It might also include years beyond
10 as well.

11 Q. Okay. And for your forecast in this
12 proceeding, only the last approximately 10 years of
13 your forecast have a carbon price included, correct?

14 A. No. I have a carbon price for 15 of the
15 20-year forecast.

16 Q. Okay. Fair enough. So starting in 2020
17 through 2024?

18 A. That's correct.

19 Q. Okay. But for the first five years of
20 your forecast, you have no carbon price, correct?

21 A. That's also correct.

22 Q. So the EIA GHG scenario for the year --
23 for the first five years would not be a comparable
24 scenario to your gas price forecast because one has a
25 carbon price and one doesn't, correct?

1 A. Yes, that's true.

2 Q. Okay.

3 MR. FISK: Your Honor, could we go off
4 the record for a second?

5 EXAMINER PRICE: You may.

6 (Discussion off the record.)

7 EXAMINER PRICE: We're back on, yes.

8 Q. Okay. Going back to Figure 9 corrected,
9 there's also a GHG25 scenario there -- identified
10 there; is that correct?

11 A. Yes.

12 Q. Okay. And that is the EIA 2014 AEO
13 scenario in which a \$25 per ton carbon price was
14 assumed; is that right?

15 A. Yes. It's a similar discussion we had
16 previously. It's in dollars per metric ton. It's in
17 real dollars so it's escalating with inflation and, I
18 believe, also has a 5 percent escalation on top of
19 the starting point, which is 25 in, I believe, 2012
20 dollars starting in the year 2015.

21 Q. Okay. If you could turn to page 14 of
22 your rebuttal testimony, starting on line 22 -- let
23 me know when you are there.

24 A. I'm there.

25 Q. Okay. And you have a sentence there that

1 says, "Lower than expected short-term gas prices have
2 therefore not lead to equally lower electrical energy
3 prices..." Do you see that?

4 A. Yes. And it continues, "the effects are
5 much more muted."

6 Q. Okay. And the electrical energy prices
7 to date in 2015 have been approximately 10 to
8 15 percent lower than what you forecast; is that
9 right?

10 A. Yes. That's the forecast using the
11 futures gas price from 2014, and the 10 to 15 percent
12 is about the right number.

13 Q. Okay. Thank you. If you could go to
14 page 24 of your rebuttal, lines 1 to 2.

15 MR. HAYS: Excuse me, Shannon, what was
16 the page number?

17 MR. FISK: Page 24.

18 MR. KUTIK: What lines?

19 MR. FISK: Lines 1 to 2.

20 Q. And let me know when you are there,
21 Mr. Rose.

22 A. I'm there.

23 Q. Okay. And you have a sentence there that
24 discusses major structural changes in the PJM
25 capacity market; is that correct?

1 A. Yes.

2 Q. Okay. And am I correct that these major
3 structural changes are what led to an increase in the
4 capacity price in the 2018-2019 PJM capacity auction
5 compared to the 2017-2018 capacity auction?

6 A. Yes. I'm primarily referring to the net
7 effect of the capacity performance plan, which has
8 several subcomponents. If you want to talk about the
9 structural changes, that's the focal point.

10 Q. Okay. So the capacity performance
11 product was -- was a major structural change in the
12 PJM capacity market; is that right?

13 A. Yes. It hasn't been fully implemented
14 but it is a -- a major structural change.

15 Q. Okay. And that capacity performance
16 product had an upward impact on capacity prices in
17 the 2018-2019 capacity auction; is that right?

18 A. Yes; among other increases, yes.

19 Q. Okay. And you are aware that in early
20 2015 PJM lowered its peak demand forecast; is that
21 correct?

22 A. Yes.

23 Q. Okay. And all else being equal, a
24 lowering of the forecasted peak demand in PJM would
25 have a downward effect on capacity prices; is that

1 right?

2 A. It -- if you -- yes, if you lower the
3 demand, it would have a downward effect. I think it
4 wouldn't -- I wouldn't expect it to be significant in
5 the long term because the effect is muted by the
6 flattening of the supply curve. But it -- it can
7 have that effect but not -- not in a major way on the
8 long-term average.

9 Q. And when did you complete your capacity
10 price forecast in this proceeding?

11 A. Approximately May, June, in that period
12 of time, 2014.

13 Q. Okay. So your capacity price forecast
14 did not account for PJM's early 2015 lowering of its
15 peak demand forecast, correct?

16 A. That's correct. I had a different PJM
17 demand forecast.

18 Q. Okay. You used the 2014 PJM demand
19 forecast?

20 A. Yes.

21 Q. Okay.

22 MR. FISK: Your Honor, may we approach?

23 EXAMINER PRICE: You may.

24 MR. FISK: May we have this document
25 marked Sierra Club 87.

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1 EXAMINER PRICE: It will be so marked.

2 MR. FISK: Thank you.

3 (EXHIBIT MARKED FOR IDENTIFICATION.)

4 Q. Okay. Mr. Rose, you have been handed a
5 document that's been marked Sierra Club Exhibit 87.
6 It is an ICF International White Paper entitled "New
7 Regime, New Results: Insights from Recent PJM
8 Auctions." Is that correct?

9 A. Yes.

10 Q. Okay. And you have seen this document
11 before; is that right?

12 A. Yes.

13 Q. Okay. And you reviewed this document
14 before it was published; is that right?

15 A. Yes.

16 Q. Okay. And you had some recommended
17 changes to this document before it was published; is
18 that right?

19 A. Yes.

20 Q. Okay. And starting on -- well, yeah,
21 starting on page 1 about midway down the page, there
22 is a header that says "What Happened and Why." Do
23 you see that?

24 A. I do see the header, yes.

25 Q. Okay. And there's then a discussion in

1 the paragraph below that header about the 2018-2019
2 PJM capacity auction and various changes to PJM that
3 affected that auction; is that right?

4 A. I mean, there is a lot in the paragraph.

5 Q. Sure.

6 A. It does talk about some of the changes.

7 Q. And if you -- the seventh line there is a
8 little Roman numeral "iv." Do you see that? It says
9 "the peak demand"?

10 A. Yes, I see that.

11 Q. Okay. And that refers to "the peak
12 demand for 2018/2019 was revised down, resulting in a
13 decrease of about 3.5 GW in capacity requirements."
14 Do you see that?

15 A. Yes, I see that.

16 Q. Okay. And to your knowledge, is that the
17 same peak-demand reduction as the early 2015 PJM
18 peak-demand reduction that we were discussed a couple
19 of minutes ago?

20 A. Yes, I believe so.

21 Q. Okay. And if you turn over to -- I'm
22 sorry. Staying on page 1, six lines from the bottom,
23 towards the end of that line there is a reference to
24 Exhibit 1. Do you see that?

25 A. I see the reference to Exhibit 1, yes.

1 Q. Okay. And it says -- for Exhibit 1 it
2 says, "ICF provides an estimate of the rough impact
3 of each of these parameters on the PJM RTO capacity
4 price." Do you see that?

5 A. I see that sentence that you read, yes.

6 Q. Okay. And then if you turn over to page
7 2 of the document, that's where Exhibit 1 is located;
8 is that right?

9 A. Yes.

10 Q. Okay. And so Exhibit 1 on the left side
11 it has a bar with a number 120 in it, which is the
12 2017-2018 capacity price; is that right?

13 A. Yes.

14 Q. Okay. And on the far right side there is
15 a bar that has the number 165 in it, which is the
16 2018-2019 capacity price; is that right?

17 A. Yes. For the RTO region, yes.

18 Q. Okay. And that's for the capacity
19 performance products, correct?

20 A. Yes.

21 Q. Okay. So not for the base residual
22 product; is that right?

23 A. That's correct.

24 Q. Okay. And the 165 figure, that's
25 expressed in dollars per megawatt-day; is that right?

1 A. Yes.

2 Q. Okay. And then in between those two bars
3 that we just talked about is identification of
4 various changes implemented to the auction and an
5 illustrative identification of the estimated impact
6 of those changes on the capacity price; is that
7 right?

8 A. Yes.

9 Q. Okay. And so for the bar that's the
10 second from the right says "Impact of CP." Do you
11 see that?

12 A. Yes.

13 Q. Okay. And could we agree the CP there is
14 the capacity performance product?

15 A. Yes.

16 Q. Okay. And so the illustrative estimate
17 is that it had an upward impact of \$36; is that
18 right?

19 A. Yes. Almost all the change between 120
20 and 165 is due to the 36. The numbers all net out
21 approximately to zero.

22 Q. Okay. And the third bar from the left is
23 labeled "Lower Peak Demand." Do you see that?

24 A. Yes.

25 Q. Okay. And that identifies a \$30 downward

1 impact on the capacity price; is that correct?

2 A. Yes. It's a rough illustrative
3 calculation, but it does show that number.

4 Q. Okay. And that's for the -- that early
5 January, 20 -- early 2015 PJM downward adjustment to
6 its peak demand forecast; is that right?

7 A. Yes. It's very specific to that demand
8 adjustment.

9 Q. Okay.

10 A. Because it depends exactly where you are
11 on the PJM demand curve.

12 Q. Okay. And the bar just to the left of
13 that, it says 31 in it. Do you see that?

14 A. Yes.

15 Q. And it says that it's for the "STPRT
16 elimination." Do you see that?

17 A. Yes.

18 Q. Okay. That's the short-term procurement
19 requirement; is that right?

20 A. Yes. There's an approximately offsetting
21 change to the procurement that you are referring to,
22 the STPRT and the peak demand number.

23 Q. Okay. And that leads to a -- that tends
24 to have an upward impact on capacity prices?

25 A. Yes. The STPRT, the short-term

1 procurement change, had an upper effect, yes.

2 Q. And do you know when that change was
3 made?

4 A. FERC ruled on it in early 2014.

5 Q. Okay. So was that change reflected in
6 your PJM capacity price forecast?

7 A. Yes.

8 Q. Okay. The middle bar on this page,
9 that's labeled 27. Do you see that?

10 A. Yes.

11 Q. Okay. And the label for that says "Net
12 CONE and VRR Changes." Do you see that?

13 A. Yes.

14 Q. And the net CONE, that's referring to the
15 fact that the net CONE for the 2018-2019 auction was
16 lowered; is that right?

17 A. Yes. It was lowered and will be
18 increasing over the next three years.

19 Q. Okay. And do you know when PJM decided
20 to lower the net CONE?

21 A. Approximately the same period it made the
22 change we talked about earlier, sometime in early
23 2014.

24 Q. Okay. And the lowering of net CONE would
25 have a downward effect on capacity prices; is that

1 right?

2 A. Yes, it can have a downward effect. Yes.

3 Q. Okay. And the lowering of the net
4 CONE -- so the net CONE for the 2018-2019 capacity
5 auction was lower than the net CONE for the 2017-2018
6 auction; is that right?

7 A. Yeah. This is all subject to
8 recollection. The numbers, the net CONE numbers of
9 PJM went down from approximately \$350 a megawatt-day
10 down to \$300 a megawatt-day.

11 Q. And the 2017-2018 PJM auction occurred
12 in -- was it around May of 2014?

13 A. Yes.

14 Q. So would -- wouldn't the lowering of the
15 net CONE have occurred after that?

16 A. I believe so. I don't remember exactly
17 when it happened. But I have it here, I think, in
18 the footnote in my document if you want me to look
19 for it.

20 Q. Sure. And in your rebuttal testimony?

21 A. Yes.

22 Q. Okay.

23 A. I am looking at page 21 and the footnote
24 there. I believe the downward change in the net CONE
25 was reflected in the most recent auction, the one

1 that occurred in 2015. I'm not sure if it was
2 included in the 2014 auction. So if I left that
3 impression, I didn't intend to do that.

4 Q. Okay. And when you say the "2015
5 auction," that's for the 2018-2019 delivery year,
6 correct?

7 A. Yes.

8 Q. Okay. So do you know whether the
9 lowering of the net CONE was factored into your
10 forecast of capacity prices in this proceeding?

11 A. I don't believe -- I believe my forecast
12 takes into account the correct net CONE numbers, and
13 so I think it does take it into account.

14 Q. Okay. Do you recall being deposed last
15 week?

16 A. I do.

17 Q. Okay. And I believe at that time you did
18 not recall whether your forecast had included the
19 lowered net CONE; is that right?

20 A. Do you have a particular reference?

21 Q. Yes.

22 MR. FISK: May we approach?

23 EXAMINER PRICE: You may.

24 Q. You have been handed a copy of your
25 deposition transcript, Mr. Rose, on your rebuttal

1 testimony; is that correct?

2 A. Yes.

3 Q. Okay. And this is the transcript for the
4 deposition that was taken on Friday, October 23,
5 2015; is that right?

6 A. Yes.

7 Q. Okay. And if you turn to page 65 of
8 your -- of this transcript, line 14, and the question
9 there it says:

10 "Okay. Did your -- so for the present
11 proceeding, did your capacity price forecast assume
12 any lowering of net CONE?"

13 Answer: "I would have to double check.

14 "I can't say sitting here right now."

15 Did I read that correctly?

16 A. Where are you? What page?

17 Q. Page 65, line 14.

18 A. So -- I am not sure what the question is.

19 Q. The question was just did I read that
20 correctly.

21 A. You did read that correctly.

22 Q. Okay.

23 A. And I do think that my forecast takes
24 into account the proper net CONE, and it's related to
25 the fact that the net CONE is an estimate of what the

1 cost of new power plants are, the net cost of new
2 entry, and I believe I have a reasonable estimate of
3 that in my forecast.

4 MR. FISK: Your Honor, I would move to
5 strike everything after, "Did I read that correctly?"

6 EXAMINER PRICE: Granted.

7 MR. FISK: Thank you.

8 Q. Okay. Going back to Sierra Club Exhibit
9 87, on page 2, I believe we had talked a few minutes
10 ago about there was a reference on Exhibit 1 to VRR
11 changes. Do you see that?

12 A. Yes.

13 Q. Okay. And what are those?

14 A. Those are changes to -- I believe it's
15 the variable revenue requirements. It's the changes
16 to the PJM demand curve.

17 Q. Okay. And Exhibit 1 offers an
18 illustrative estimate of the impacts of the net CONE
19 and VRR changes of a \$27 increase to capacity prices;
20 is that right?

21 A. Yes.

22 Q. Okay. And so the VRR changes have an
23 upward impact on capacity prices that exceeds the
24 downward impact of net CONE; is that right?

25 A. Yes.

1 Q. Okay. And do you know when those VRR
2 changes were made?

3 A. No, I don't remember the exact date. It
4 was sometime in the last year or so.

5 Q. Okay. And then, finally, the bar that is
6 labeled -- that has a negative 19 number, do you see
7 that?

8 A. Yes.

9 Q. Okay. And there is a number of changes
10 there identified for that, including "EFORD IRM,
11 Local Requirements, CETL and FRR Changes." Do you
12 see that?

13 A. Yes, I do see them.

14 Q. And so the combined impact of those
15 changes is a downward pressure on capacity prices; is
16 that right?

17 A. Yes.

18 Q. Okay. And do you know when those changes
19 were made?

20 A. I don't have the exact date for each one.
21 It's over the last year or so.

22 Q. Okay.

23 A. It didn't all occur at the same time.

24 Q. Okay. Do you know, did they all occur
25 after your capacity price -- after you created your

1 capacity price forecast in this proceeding?

2 A. Well, some are -- I believe some were
3 proposed before, and some were approved before, some
4 were approved after, but I don't have the exact dates
5 for all of them.

6 Q. Okay. And do you know whether your
7 capacity price forecasts incorporated those changes?

8 A. Overall I believe, yes, they incorporated
9 the major drivers, and these things have relatively
10 small effects in the long term on the average but
11 they have bigger effects in the short term. I think
12 it's a reasonable characterization of the overall net
13 effects.

14 Q. And do you know if your capacity price
15 forecast incorporated the impacts of the VRR changes?

16 A. Yeah. Again, in the long run the VRR
17 changes have relatively little effect. It's really a
18 short-term phenomenon, so I believe a reasonable
19 long-term treatment. And the reason for that is that
20 in the long run, the supply curve is the cost of new
21 units, and you can build as many as you want for
22 \$1,000 a kilowatt, and it sets the price.

23 The VRR is really affecting the price
24 when you are not in equilibrium, when you don't need
25 new power plants, and so it's a short-term effect.

1 It's not a long-term effect. So I think it's a
2 reasonable treatment of all -- of these parameters.

3 MR. FISK: Your Honor, I would move to
4 strike that answer. I simply asked whether the VRR
5 changes had been incorporated into his capacity price
6 forecast.

7 MR. KUTIK: And he explained why, your
8 Honor.

9 EXAMINER PRICE: I agree. The motion
10 will be denied. I agree with Mr. Kutik that he
11 explained. His answer was explanatory. The motion
12 is denied.

13 MR. FISK: Could I have the answer read
14 back?

15 EXAMINER PRICE: You may.

16 (Record read.)

17 MR. FISK: Thank you.

18 Q. When you refer to a short-term effect,
19 what time frame are you referring to?

20 A. Around one or two or three years. And
21 it's a short-term effect, again, for the reasons I
22 indicated, which is ultimately the supply in
23 equilibrium. The word equilibrium is -- the supply
24 is setting the price in the marketplace for capacity.

25 Q. Okay. So you would expect any upward

1 pressure on capacity prices for the VRR changes to --
2 to only last for about one to three years; is that
3 right?

4 A. Yes.

5 Q. Okay. And I believe in your answer a
6 couple -- a couple of answers ago you referred to a
7 \$1,000 per kilowatt figure.

8 A. Yes, I did.

9 Q. And is that for building new natural gas
10 combined cycle?

11 A. Yes. It's an approximate number in real
12 dollars. I am trying to illustrate the fact you can
13 build as many power plants as you need and the demand
14 is growing, or it's at some level and you need more
15 power plants. That sort of sets the price for
16 capacity, as it sounds. It's the cost of capacity in
17 kilowatts, and so that has a dominant -- a dominant
18 effect. The supply curve essentially flattens and
19 sets the price. I think that's a reasonable
20 treatment of capacity prices in the long term on
21 average.

22 MR. FISK: Could I have that answer read
23 back?

24 EXAMINER PRICE: You may.

25 Could I have the question and the answer?

1 MR. FISK: Yes.

2 (Record read.)

3 MR. FISK: Your Honor, I would move to
4 strike starting with "I am trying to illustrate."

5 MR. KUTIK: Your Honor, I think he was
6 basically explaining the thousand-dollar-kilowatt
7 number. And he did.

8 EXAMINER PRICE: I think Mr. Fisk asked a
9 very open-ended question, and the witness took
10 advantage of that opening to give a long
11 dissertation.

12 MR. FISK: Thank you, your Honor.

13 EXAMINER PRICE: So we will deny the
14 motion.

15 But we will caution Mr. Rose to please
16 continue to focus on the question being asked.

17 THE WITNESS: Yes, your Honor.

18 Q. (By Mr. Fisk) That \$1,000 per kilowatt
19 figure you identified for new natural gas combined
20 cycle, is that an all-in cost?

21 A. Yes. It's taking into account cost of
22 hookups, all of the associated total costs for
23 building a facility. That would be the capital --
24 total capital costs.

25 Q. Okay. And you believe that's a

1 reasonable estimate of the total all-in capital costs
2 for new natural gas combined-cycle facility?

3 A. It depends where you are. I'm using a
4 round number to illustrate the point.

5 Q. Is it a reasonable estimate for Ohio?

6 A. Plus or minus 5 or 10 percent, yes, I
7 think so. It depends on exactly what the
8 circumstances are how close it is to a pipeline, how
9 close it is to a transmission line, whether it's a
10 brownfield new facility or greenfield new facility.
11 It's also expressed in summer kilowatts so it's
12 dollars per summer kilowatt, not dollars per average
13 kilowatt. The combined cycle output decreases a lot
14 during the summer.

15 Q. Okay. On your rebuttal testimony page
16 21 --

17 EXAMINER PRICE: Could I ask a follow-up
18 question?

19 MR. FISK: Feel free.

20 EXAMINER PRICE: Why does the
21 combined-cycle output diminish during the summer?

22 THE WITNESS: What's happening --

23 MR. KUTIK: I'm sorry, your Honor. I
24 didn't hear your question.

25 EXAMINER PRICE: I was following up the

1 last thing he said, in summer the combined-cycle
2 output goes down. I had never heard that before so I
3 was just curious.

4 MR. KUTIK: I just didn't hear your
5 question.

6 EXAMINER PRICE: Sure.

7 THE WITNESS: Let me just say it's
8 related to when they first developed jet engines,
9 they took them to high altitude to test to see
10 whether or not they would work. There is less air
11 density, so what's happening is you are having an
12 explosion, and it's pushing through a certain mass,
13 sort of, if you will, rotating blades or creating
14 sort of an impulse reaction.

15 So when there is less air density during
16 the summer, you end up having less output. So it's
17 typical that you would lose between, average annual
18 conditions, in the summer 7 percent of the total
19 output because there is not enough air density. And
20 that's why they took it to the top of the mountains
21 where there is also less air density because you lose
22 a lot when you go to higher altitude.

23 Temperature, altitude are the most
24 important things, and that variability is -- is a big
25 deal when you do dollars per kilowatt because when

1 you have less kilowatts in the summer, it tends to
2 raise the number. I think it's more accurate.

3 Typical power plants that are just
4 having -- like a coal or nuclear thermal power plant,
5 they don't have anywhere near that size of effect.
6 It's really what they call air breathing machines,
7 jet engines, and that drives the combined cycle and
8 also the combustion turbine.

9 EXAMINER PRICE: Thank you. That was
10 very good. Thanks.

11 MR. FISK: Thank you, your Honor.

12 Q. (By Mr. Fisk) If you could turn to your
13 rebuttal testimony page 21, lines 1 through 5. Let
14 me know when you are there.

15 A. Page 21?

16 Q. Yes.

17 A. I'm there.

18 Q. Okay. And you discuss there an increase
19 in the capacity offer price cap for the PJM capacity
20 auction; is that correct?

21 A. Yes, sir.

22 Q. Okay. And you raise the possibility that
23 the raising of the capacity offer price cap may
24 result in a price regularly near that cap if bids
25 rise towards the cap; is that right?

1 A. Yes, I think that's right. You already
2 have one instance, which I mentioned where it said
3 99 percent of the cap. That's the first time, and I
4 believe over time, there is a tendency -- there could
5 be a tendency to move towards the cap, and it will
6 occur as people get comfortable with the new legal
7 situation.

8 MR. HAYS: Your Honor, could I ask the
9 answer be read back. I missed the end of it.

10 EXAMINER PRICE: Yes. Just the answer?

11 MR. HAYS: Yes, just the answer.

12 EXAMINER PRICE: Can we have the previous
13 answer back again.

14 (Record read.)

15 MR. HAYS: Thank you.

16 Q. (By Mr. Fisk) That instance that you are
17 referring to, that was in the EMAAC zone; is that
18 right?

19 A. Yes. The price was 99 percent of the cap
20 and demonstrates you can do that, and thus far there
21 hasn't been any legal repercussions that I am aware
22 of.

23 Q. And if you could turn to page 4 of
24 Exhibit 87, just the ICF New Regime, New Results
25 document. Let me know when you are there.

1 A. Page 4?

2 Q. Yes.

3 A. I'm there.

4 Q. There is a header "Key Outcomes and
5 Lessons Learned." Is that right?

6 A. I see the header, yes.

7 Q. Okay. And in that first paragraph it
8 says prices in the RTO cleared at 69 percent of the
9 offer cap; is that right?

10 A. Yes. So there is room for upper
11 movement, yes.

12 Q. And price increases up to the new higher
13 offer cap did not occur for RTO, also says that,
14 correct?

15 A. Yes, not yet.

16 Q. Okay. And if you turn over to page 3 of
17 this document, Exhibit 2 is a map; is that right?

18 A. Yes.

19 Q. Okay. And the RTO where the prices did
20 not go up to the cap covers all of Ohio; is that
21 right?

22 A. Yes.

23 Q. Okay. And EMAAC is the green area on
24 this map. That's over in New Jersey, Delaware, parts
25 of Maryland and Pennsylvania; is that right?

1 A. Yes, sir.

2 Q. Okay. Okay. And on page 4 on this
3 document, the second paragraph under Key Outcomes and
4 Lessons Learned, there's an identification of two
5 reasons why prices in the EMAAC regions cleared close
6 to the offer cap. Do you see that?

7 A. Yes, sir.

8 Q. Okay. And one of them is that units in
9 EMAAC regions have high CP compliance risk. Do you
10 see that?

11 A. Yes.

12 Q. Okay. And those high CP compliance
13 risks, would you agree, are higher in EMAAC than in
14 the RTO?

15 A. For the marginal price setting unit, yes.
16 There's some plants I think that have similar risks
17 outside of EMAAC, but I think for -- for the marginal
18 price of the unit, I think that's fair.

19 Q. And when you say that, you mean the
20 marginal unit that sets -- that ends up setting the
21 capacity price?

22 A. Yes.

23 Q. Okay. Okay. And if you could turn to
24 page 8 of this Sierra Club Exhibit 87 -- actually
25 before we turn to that, EMAAC was a constrained

1 transmission zone, correct?

2 A. Yes. It was one of two, so another --
3 another one broke away from the RTO region, ComEd
4 region.

5 Q. So the RTO region, that was not
6 constrained zones, correct?

7 A. Yes and no. I mean, RTO started off to
8 include Commonwealth Edison. It broke off, so the
9 average RTO price for the RTO before the auction
10 includes this high price region ComEdison and the
11 price of 215 and 165.

12 Q. Okay. But for the 2018-2019 auction,
13 besides ComEd and EMAAC, the rest -- the RTO section
14 was not constrained, correct?

15 A. Yes, that's correct.

16 Q. Okay. Back to page 8 on this ICF
17 document, there is a discussion in the first full
18 paragraph of text it says, "With the implementation
19 of CP, the incentives for speculative bidding for new
20 resources have been reduced." Do you see that?

21 A. Yes.

22 Q. And then the third sentence says, "In
23 short, PJM seems to have achieved the goal of
24 designing incentives so that bidding resources are
25 actually likely to become operational, and therefore

1 that capacity clearing in the market will be present
2 and on schedule." Do you see that?

3 A. I do see it. And PJM has achieved the
4 goal because it was forced by FERC to do so.

5 Q. Okay. But you would agree that the
6 structural changes discussed in your rebuttal
7 testimony regarding the capacity performance product
8 will achieve that goal?

9 A. Yes. I believe it will change the
10 situation that you see above. This is referring to
11 Exhibit 10, where you see a lot of the power plants
12 that were supposed to come online didn't come online.

13 Q. Okay.

14 A. It's the difference between the blue and
15 the orange lines.

16 Q. Okay. So you would expect, moving
17 forward, that the blue line, which is new capacity
18 online, would be a lot closer in value to the orange
19 line, which is what cleared; is that right?

20 A. Yes, based on the tighter penalties that
21 FERC imposed in PJM.

22 Q. Okay. And if you look at the second full
23 paragraph under Exhibit 10, it starts "PSEG
24 announced." Do you see that?

25 A. Yes, sir, I do see that.

1 Q. And this paragraph is discussing new
2 capacity that ICF believes cleared in the 2018-2019
3 capacity auction; is that right?

4 A. Yes. It uses the word "believes" because
5 that information has not been released by PJM.

6 Q. Okay.

7 A. So we are making our best assessment of
8 which units cleared.

9 Q. Okay. And do you know what -- how that
10 assessment is made?

11 A. It's in part -- sometimes there is market
12 intelligence. People will make an announcement.
13 Sometimes we'll -- you can sort of see by the size of
14 the plants which ones are likely to be there. You
15 also look at the ones that cleared the
16 interconnection queue, whether they have a signed
17 interconnection agreement, permits, et cetera.

18 So you can look at the announced plans,
19 look at their status, the permitting status, market
20 intelligence. But the bottom line is it's an
21 estimate because we know about the 2.5 gigawatts. We
22 don't know the names of the plants that cleared.
23 It's not being released by PJM.

24 Q. Okay. Do you see the last two lines of
25 that paragraph refers to AdvancePower's Carroll

1 County facility? Do you see that?

2 A. I do see that.

3 Q. Okay. Is it your belief that that
4 cleared in the 2018-2019 auction?

5 MR. KUTIK: Well, I'll object to the
6 extent that it would call -- call for him to reveal
7 proprietary information that he has.

8 A. I don't have any reason to disagree with
9 the sentence at this point.

10 EXAMINER PRICE: Your counsel had a
11 pending objection. I presume that that answer you
12 just gave was informed by not giving out any
13 proprietary information.

14 THE WITNESS: Yes, that's correct.

15 MR. KUTIK: Thank you, your Honor.

16 MR. FISK: Could I have the answer read
17 back?

18 EXAMINER PRICE: You may.

19 (Record read.)

20 Q. Okay. And so when you referred to the
21 sentence, are you referring to all of the projects
22 identified in that sentence?

23 A. Subject to memory for -- subject to
24 memory check.

25 Q. Okay. Thank you. Looking at your

1 rebuttal testimony page 28 on lines 11 through 12,
2 let me know when you are there.

3 A. I'm there.

4 Q. Mr. Rose, your microphone appears to have
5 gone off.

6 MR. KUTIK: So has yours and mine.

7 MR. FISK: There we go.

8 Q. Okay. So on lines 11 to 12 you say "Mr.
9 Comings' capacity prices are similar to recent 2015
10 auction results." Do you see that?

11 A. I do see that.

12 Q. Okay. And the 2015 auction results that
13 you are referring to there is the 2018-2019 PJM
14 capacity performance auction; is that right?

15 A. Yes, which is -- and that -- those
16 sentences refer to the fact it's a partial
17 implementation of the CP order but with that caveat
18 it's -- it is what it says there.

19 Q. Okay. And Mr. Comings's capacity price
20 for 2018-2019 is closer to the actual results than
21 what you projected for that auction, correct?

22 A. Well, he is closer for that one year
23 result. I think he is going to be too low and off
24 for the long-term average, and I think he was right
25 for the -- closer for the wrong reason, and he has to

1 take into account, as you can see here in these
2 sentences, that we are talking about he hasn't taken
3 into account the full implementation of the CP order,
4 which will raise demand by a quarter, as you can see
5 there, and will raise prices.

6 MR. FISK: Could I have that question and
7 answer read back?

8 EXAMINER PRICE: You may.

9 MR. FISK: Thank you.

10 (Record read.)

11 MR. FISK: Your Honor, I move to strike
12 everything after "one year result." My question was
13 focused on the 2018-2019 capacity auction results.

14 EXAMINER PRICE: We will grant your
15 motion.

16 The information you provided after that
17 information Mr. Kutik can elicit from you on redirect
18 if necessary.

19 MR. FISK: Thank you, your Honor.

20 THE WITNESS: Yes, your Honor.

21 MR. FISK: May we approach?

22 EXAMINER PRICE: You may.

23 MR. FISK: Can we have this marked as
24 Sierra Club Exhibit 88?

25 EXAMINER PRICE: You may.

1 (EXHIBIT MARKED FOR IDENTIFICATION.)

2 Q. (By Mr. Fisk) Mr. Rose, you have been
3 handed a document that's been marked as Sierra Club
4 Exhibit 88. It is an ICF International White Paper
5 entitled "Capacity Performance: Changing the Game in
6 PJM ISO." Do you see that?

7 A. I do see it. But let me just look at it,
8 please.

9 Q. Okay. Take your time.

10 EXAMINER PRICE: You are cited there.

11 THE WITNESS: I am cited there.

12 EXAMINER PRICE: I like the color copy
13 better.

14 MR. FISK: Sorry. We ran out of access
15 to the color printer last night whenever Fed Ex
16 closed.

17 EXAMINER PRICE: The one down here?

18 MR. FISK: Yeah. I think it closes at 10
19 or something, or 9.

20 EXAMINER PRICE: We use it at home in
21 lieu of a printer.

22 MR. KUTIK: Are we on the record, your
23 Honor?

24 EXAMINER PRICE: We are. He is looking
25 at his document.

1 A. Okay.

2 Q. Mr. Rose, have you ever seen this
3 document before?

4 A. I believe so.

5 Q. Okay. And does it appear to be an ICF
6 International White Paper?

7 A. Yes.

8 Q. Okay. And this White Paper discusses
9 PJM's proposed capacity performance product; is that
10 correct?

11 A. Yes, which is now in the process of
12 being -- it was approved in June of this year and is
13 in the process of being implemented. It's not been
14 fully implemented yet.

15 Q. Okay. And the capacity performance
16 product was proposed by PJM in December of 2014; is
17 that right?

18 A. Yes, it was, I believe, proposed December
19 12, 2014, but it's the -- there were earlier
20 announcements and related -- first major announcement
21 was August 20, 2014.

22 Q. Okay. And on the very back -- well,
23 actually, on the first page down at the bottom it has
24 a copyright of 2015 ICF International. Do you see
25 that?

1 A. Yes. But it doesn't -- it doesn't have
2 the exact date.

3 Q. Okay. Can we agree this document was
4 created sometime in -- published sometime in 2015?

5 A. Yes.

6 Q. Okay. And if you look at the very --
7 towards the top of page 1, it says "The Bottom Line."
8 Do you see that?

9 A. Yes.

10 Q. Okay. And the first paragraph says that
11 "PJM Interconnection LLC's proposed new capacity
12 market mechanisms will push PJM regional transition
13 organization's capacity prices up to \$170 to
14 \$200/MS-day." Do you see that?

15 A. Yes. And even higher for some
16 constrained local deliverability areas, which is
17 pretty close to what happened.

18 Q. Okay. But the 170- to 200-dollar
19 megawatt-day for RTO -- RTO is where the plants we
20 are dealing with in this proceeding are located,
21 correct --

22 A. Yes. They are in the RTO Capacity
23 region.

24 Q. Okay. Do you know how the \$170 to \$200
25 figure there was generated?

1 A. It was based on some short-term
2 considerations, so focus on short-term developments.

3 Q. Okay. I guess, do you know, was it
4 created through some sort of a model?

5 A. It was -- there was some, I think, "back
6 of the envelope" calculations that were used to make
7 this forecast.

8 Q. Okay. So to your knowledge was any IPM
9 modeling done to make that forecast -- this forecast
10 that's identified on Exhibit 88?

11 A. No, not -- no long-term IPM model.

12 Q. If I was going to ask you a directional
13 question regarding your forecasts, should I save that
14 for confidential, on the capacity price?

15 A. Yeah. I think so.

16 Q. Okay. Okay. And if you turn over to
17 page 4 of this document --

18 A. I just -- I did want to clarify what I
19 said, that it was short term, and it was specifically
20 for the next auction.

21 Q. Next auction being 2018-2019?

22 A. The one that occurred this year.

23 Q. Okay.

24 A. So this was issued in advance of the
25 auction, and the numbers turned out to be very close.

1 Q. Okay. And, sorry, I think I sent you to
2 the wrong page. Page 6, the very back page, there's
3 a paragraph around the middle of the page that
4 says -- starts with "Although the CP product." Do
5 you see that?

6 A. I see that, yes.

7 Q. Okay. And so that sentence reads,
8 "Although the CP product increases capacity prices,
9 it would lead to lower energy prices for these
10 reasons," and then it lists three different regions.
11 Do you see that?

12 A. I do see that, yes.

13 Q. Okay.

14 A. I don't think the effect is large in the
15 long run, but this is mostly focusing on the near
16 term, but I do see that.

17 Q. If you could go back to page 1, that
18 paragraph that we were discussing earlier under The
19 Bottom Line, the sentence that starts towards the end
20 of line 4, it says, "Energy prices will be slightly
21 lower in the long term." Do you see that?

22 A. Yeah. It -- yes, I see that, and it's
23 referring to slightly lower, but it's also referring
24 to lower than something, and my forecast anticipated
25 that these forms would be put into place; therefore,

1 I don't think there would be any major effect on the
2 energy prices.

3 Q. Okay. But you would agree that the
4 reference to lower energy prices on page 6 of this
5 document was talking about long term, not short term;
6 is that right?

7 A. Just slightly lower in the long term, but
8 not in comparison to the forecast that I have, which
9 anticipated in the long term an effective capacity
10 market.

11 Q. With that answer, were you referring to
12 page 1 or page 6?

13 A. Both.

14 Q. Okay.

15 EXAMINER PRICE: May I just ask a
16 question to clarify a question on this document?

17 MR. FISK: Certainly.

18 EXAMINER PRICE: Mr. Rose, this document
19 was prepared based upon the capacity performance
20 proposal; is that correct?

21 THE WITNESS: Yes. I believe it was
22 before the auction, and I believe it was -- it was.
23 But it could have also been after the June 5, I
24 believe, FERC order.

25 EXAMINER PRICE: So it may have been

1 prepared in response to the final -- I am just trying
2 to understand whether this was prepared in response
3 to the actual capacity performance rule or the first
4 capacity performance proposal that was issued.

5 Or does it not make any difference, and I
6 shouldn't worry about it?

7 THE WITNESS: I believe it was printed
8 before the June 5 order, and I don't -- the June 5
9 order tightened up PJM's request. I don't think it
10 affects the outcome here in a major way. This is
11 focusing on the next auction results and in
12 comparison to a situation in which you did not have
13 an effective capacity regime.

14 EXAMINER PRICE: Thank you. That's very
15 helpful. Thank you.

16 MR. FISK: Thank you, your Honor.

17 Q. (By Mr. Fisk) Okay. If you could go back
18 to Exhibit 87, it's the New Regime, New Results ICF
19 document. And let me know when you have got it.

20 A. Okay. I have it.

21 Q. Okay. If you could turn to page 3, if
22 you look down at footnote 1, it says, "ICF
23 projections for CP Product in the range of
24 \$180-\$200/MW-day were revised downward to the range
25 of \$150 to \$160/MW-day after PJM modified its tariff

1 removing firm fuel requirements CP Product
2 qualification." Do you see that?

3 A. Yes, I do see that.

4 Q. Okay. And do you know when PJM modified
5 its tariff removing firm fuel requirements?

6 A. It was part of the June 5 order.

7 Q. Okay. Do you know when the ICF
8 projection was revised downward to the range of \$150
9 to \$160 per megawatt-day?

10 A. No, I don't remember that.

11 Q. Okay. Do you know whether that \$150 to
12 \$160 per megawatt-day figure came out of any sort of
13 modeling?

14 A. I believe it was the same "back of the
15 envelope" calculations that were being done.

16 Q. Okay. And do you know the \$180 to \$200
17 per megawatt-day figure in this footnote, which is
18 somewhat different than the 170- to 200-dollar
19 megawatt-day figure included in Sierra Club Exhibit
20 88, do you know where that 180 to 200 dollars per
21 megawatt-day came from?

22 A. It's from similar calculations. They're
23 are all being done in this period.

24 Q. And do you know when that calculation to
25 derive the \$180 to \$200 megawatt day figure was done?

1 A. I believe the 170 to 200 and 180 to 200
2 were done about the same time, and I -- there may
3 have been some approximation there that I can't
4 account for the difference between 170 and 180. I
5 think there were a series of "back of the envelope"
6 calculations we were doing there.

7 Q. Okay.

8 A. And when we are looking at the short
9 term, we are doing some short-term calculations that
10 are different than the long-term calculations. This
11 wouldn't be applied necessarily for the long term for
12 the reasons we discussed earlier.

13 Q. Okay. If you could turn to page 11 of
14 this Sierra Club Exhibit 87, and there's a header
15 about a third of the way down the page that says
16 "Looking Ahead." Do you see that?

17 A. Yes.

18 Q. Okay. And this paragraph under the
19 header is discussing the potential results for the
20 2019-2020 PJM auction; is that right?

21 A. It's describing an illustrative plausible
22 scenario, not necessarily the expected value, which
23 is what you would be expecting on a
24 probability-weighted basis. It makes a series of
25 conservative assumptions, that low end of what would

1 likely be the case, and it's to illustrate the
2 ability to analyze that, if you have the ability to
3 address some of the caveats that are in the paragraph
4 there.

5 Q. Okay. And those conservative assumptions
6 are the things listed in -- in the paragraph there is
7 a listing of, it looks like, seven different
8 assumptions; is that right?

9 A. Yes. And then, you know, just to be --
10 so that it's clear, in paragraph 4 on the first page
11 in the summary box, some of the more important ones
12 are emphasized as well, and so the key is that it's
13 sort of a conservative, low-end type of estimate
14 because it makes an assumption, for example, there is
15 no Supreme Court decision -- no probability of a
16 Supreme Court decision which would lower the amount
17 of demand resources, which I don't think is proper.

18 It assumes there is no chance that people
19 will bid closer to the cap as they see that the legal
20 situation is stable, which I think is a conservative,
21 low-end assumption. So any time we present the
22 results here, we have the caveats that are in this
23 paragraph on the front page, and that's why we are
24 calling it "illustrative" and "plausible" and not
25 "expected."

1 Q. Okay. And so for this plausible
2 scenario, there is an identified illustrative
3 clearing price of approximately 143 to 159 dollars
4 per megawatt-day for the CP product in the RTO; is
5 that right?

6 A. Yes. Assuming that there is the
7 assumptions that are in the paragraph, which make the
8 price conservatively low.

9 Q. Okay. And those are -- those clearing
10 prices being projected there is with a 90 percent
11 confidence interval; is that right?

12 A. It's for a 90 percent confidence
13 interval, not taking into account the effect on the
14 confidence interval of what's likely to happen to DR,
15 what's likely to happen to bidding, what's likely to
16 happen in terms of actual experience with the penalty
17 structure during the first year that was actually in
18 place.

19 So those things would actually change the
20 distribution, both the expected value or the mean of
21 the distribution or the average as well as the
22 illustrative range. We want to demonstrate that if
23 you have a view on these type of issues, which all of
24 our clients do, then we could take that view,
25 superimpose it on the modeling, the short-term

1 stochastic or probabilistic modeling, and then we
2 could illustrate sort of the range you could get.

3 Q. Okay. So am I correct -- do you agree
4 that the scenario described here is plausible?

5 A. It's plausible, but it's a conservative
6 or low-end type of estimate since no -- I think
7 anyone would think there is no chance that the
8 Supreme Court is not going to reaffirm the lower
9 court decisions, and it wouldn't have any
10 implications on the amount of 11,000 or so megawatts
11 of demand resources, and no one would in my view, I
12 think, would recommend that. There would be no
13 chance of rate -- of bidders raising their bids, et
14 cetera, so it's a conservative, plausible, low-end
15 type of estimate.

16 Q. So if there's no chance of these
17 different things occurring, why would ICF include the
18 results of a scenario in one of their papers that
19 relies on those assumptions and have no chance of
20 occurring?

21 A. Because our clients have their views. We
22 have our views. We want our clients to come and work
23 with us to help them on their bidding. This is a
24 series of papers that are designed, in part, to
25 indicate to the clients that we have the ability to

1 work with them on the bidding.

2 And I think what you are saying is
3 exactly right. No one would take the view that
4 there's no chance that the Supreme Court is going to
5 not affirm the lower court decisions and that there
6 would be no impact on DR. There could be no expected
7 value impact.

8 And so our clients knowing that they can
9 take that view and can superimpose that on these
10 calculations and it will have a different result.
11 This is the lowest possible assumption, the idea that
12 the court is going to vacate the lower court's
13 decision.

14 Q. And this document nowhere identifies this
15 plausible scenario as conservative, correct?

16 A. No, but if you -- every time there is any
17 mention of the illustrative results, we make -- we
18 include the caveats, so it's on page 11, and it's on
19 the front box, box No. 4. And so, you know, it says
20 there are other several market developments,
21 including -- and then we list them on page 1.

22 So there's no situation in which we don't
23 sort of indicate to people what our assumptions are,
24 and for those people that are knowledgeable about the
25 marketplace, they will know that this is a low-end

1 estimate.

2 Q. Okay. When you said -- when you said
3 "no" at the beginning of your answer there, were you
4 agreeing the document doesn't specifically say that
5 this is a conservative scenario?

6 A. It doesn't use the word "conservative,"
7 but it's clearly conveying a certaintism to the
8 estimate, and it does it in every location in which
9 the numbers are presented.

10 Q. And you refer to this illustrative
11 clearing price projection as coming out of a
12 stochastic model; is that right?

13 A. Yes. We have, as I indicated in my
14 deposition, a tool that we recently developed and
15 it's -- we're offering it to entities that want to
16 work with us in developing their bids.

17 Q. Okay. And that -- so that stochastic
18 bidding model was not what you used to create your
19 capacity price forecast, correct?

20 A. That's correct. It didn't exist at that
21 time, and it's still sort of in the early development
22 phases. And it's only been used for one-year
23 projections or two-year projections forward.

24 Q. Okay. And -- what is a stochastic model?

25 A. Stochastic is related to the word

1 "statistic," so it's another word related to
2 probabilistic, and it emphasizes probabilistic
3 calculations.

4 Q. Okay. And is it a model where you can
5 run multiple scenarios to test out uncertainties in
6 various input values?

7 A. Yes. And so when you are looking at
8 one-year forward, under certain circumstances you can
9 do that. And so you could take your view what the
10 likely outcome was, for example, on demand resources
11 and put that into the model.

12 Q. But then that model would test not just
13 your specific view but also potentials that your view
14 could be off one way or the other?

15 A. You know, it's very similar to like
16 simulating a coin toss, so the most important thing
17 that you put into the description of a coin toss is
18 what's the chance of heads and what's the chance of
19 tails?

20 In this case there is only two outcomes,
21 and so what's happening is the same underlying
22 process could simulate what would happen if you do
23 the coin toss. And you have to do a lot of runs of
24 that to get an estimate of 50 percent for example in
25 the case of the coin toss typically you need like 20

1 runs and in other cases it takes up to a thousand or
2 5,000 runs.

3 Q. Okay. So -- so -- and stochastic
4 building model that ICF is developing and using gives
5 you a range of potential capacity prices, correct?

6 A. For like the necks auction result, yes,
7 that's what we use it for.

8 Q. Okay. But in this proceeding you've only
9 presented a single capacity price for each year,
10 correct?

11 A. Yes. Because it's a different problem
12 just like the IRA, et cetera, when your problems get
13 very, very complicated. You can't do it on a Monte
14 Carlo basis. It would take years to do.

15 Q. Okay.

16 A. Because there are so many variables.
17 It's not just flipping a coin. It's like you have 50
18 different variables to capture all the interactions,
19 and you have to do it year by year, and that's why
20 it's only used for very limited purposes in the near
21 term.

22 Q. Okay. In your discussion, I believe you
23 mentioned this in your rebuttal testimony with
24 regards to Monte Carlo scenarios, and I am just
25 trying to find the page references. On page 10

1 starting up at line 1, it actually starts on page 9
2 starting on line 17; is that right --

3 A. Yes. It explains when you have a very
4 complicated problem with many different variables
5 over many different years that you end up in a
6 situation in which it becomes infeasible to do that
7 assessment.

8 Q. Okay. So is it your opinion that it
9 would be infeasible to run some sort of a Monte Carlo
10 simulation to determine in this proceeding a range of
11 potential values for the likely costs and revenues
12 for the Sammis plant?

13 A. For -- my testimony is for the parameters
14 I was asked to project, which are over 20 years a
15 range of different parameters, I indicated here that
16 the Monte Carlo simulation would probably take many
17 years. And the reason for that is there are so many
18 different variables that you have to take into
19 account and you have to do a lot of trials and it
20 covers many different years and many different
21 parameters.

22 Here we are just looking at a single --
23 the previous thing, we are just looking at a single
24 number, but we are looking at a much more complicated
25 set of variables. And as I indicate here, that's why

1 in the analysis ICF does for the government, we don't
2 have the sensitivity cases, much less the Monte Carlo
3 one, and the reason for it is the complexity of the
4 analysis doesn't lend itself to it.

5 Q. So to do the Monte Carlo analysis for the
6 gas price, energy price, coal price that you were
7 asked to do in this proceeding, you are saying that
8 would have been infeasible, correct?

9 A. To do it for the set of projections that
10 we were making, we were making hourly projections for
11 20 years for three locations for electric energy
12 prices, we are taking into account all of the details
13 of the interaction of gas prices, and for the whole
14 Eastern Interconnect, that is an extremely
15 complicated problem. And so it's not feasible to do
16 that on a Monte Carlo basis, and I have never seen it
17 done.

18 And, as I indicated, in the analyses that
19 are the most significant analyses that the government
20 is doing, they are doing one scenario as well.

21 Q. But once you have those variables, so you
22 have your gas price, your coal price, your electric
23 price, is it your testimony it would be infeasible to
24 do a Monte Carlo analysis of the expected costs and
25 revenues from a specific coal plant?

1 MR. KUTIK: Objection.

2 EXAMINER PRICE: Grounds?

3 MR. KUTIK: This witness was not asked to
4 do cost and revenues. With respect to cost of
5 revenues, that is not what he is talking about in his
6 testimony, so it's beyond the scope.

7 EXAMINER PRICE: Your response?

8 MR. FISK: Well, my response is, first, I
9 am trying to clarify as to whether his claim that a
10 Monte Carlo analysis is not feasible is limited only
11 to those forecasts he did. I think it is relevant as
12 to whether the companies could have done a Monte
13 Carlo analysis around their actual projection of
14 revenues and costs because we have raised in our --

15 EXAMINER PRICE: That's beyond the scope
16 of his rebuttal testimony. It might have been -- it
17 might have been a fair question to ask on his initial
18 testimony, but you have to stay within his rebuttal
19 testimony here.

20 MR. FISK: If I may?

21 EXAMINER PRICE: You may.

22 MR. FISK: One of the arguments that a
23 number of the intervenors had made is that the
24 companies failed to do sensitivity analyses to
25 determine whether the likely -- the projected costs

1 and revenues for the Sammis and Davis-Besse plants
2 are likely to be different under different
3 assumptions, and my understanding of Mr. Rose's
4 rebuttal testimony is that it would not have been
5 possible to do that because doing a Monte Carlo type
6 analysis for those plants would have been infeasible.

7 MR. KUTIK: And Mr. Rose is talking about
8 the criticisms of his testimony and his analysis, not
9 what the company did or FES or somebody else did with
10 that information.

11 EXAMINER PRICE: In addition -- in
12 addition, we covered this whole topic in the case in
13 chief because I asked him the question. He gave the
14 same answer he gave here during the case in chief, so
15 if you wanted to follow up with that point when he
16 and I had the discussion in the case in chief, that
17 might have made sense. But now we are on rebuttal,
18 and I think you are beyond the scope of his rebuttal
19 testimony. Objection is sustained.

20 MR. FISK: Okay. May I -- so may I
21 clarify that his testimony regarding the Monte Carlo
22 analysis being infeasible does not apply to the
23 projections of costs and revenues that the companies
24 made for the plants?

25 EXAMINER PRICE: No. You can clarify

1 that his testimony only relates to his cost
2 projections. That you can ask him.

3 MR. FISK: Okay.

4 Q. (By Mr. Fisk) Mr. Rose, do you -- so your
5 testimony on page 9 of your rebuttal testimony, page
6 9, line 17 through line 8 on page 10, discusses your
7 opinion that it is not feasible to do Monte Carlo --
8 Monte Carlo simulations for the forecasts that you
9 made in this proceeding, correct?

10 A. Yes. And you can see that on line 23, 24
11 where each run would require me to run MAPS and IPM,
12 each of which takes four to six hours. And I also
13 expressed the possibility that to do that requires as
14 much as 5,000 runs and somewhere between 4.6 and 6.8
15 years.

16 Q. And so your testimony regarding the
17 feasibility of doing Monte Carlo simulations is
18 limited solely to the forecasts of gas prices, coal
19 prices, electric energy prices, and CO-2 prices that
20 you provided in this proceeding; is that right?

21 A. Yes. But, of course, those forecasts are
22 associated with lots of other parameters and
23 forecasts and calculations, and that's what makes it
24 infeasible. It's millions of different variables
25 that are involved.

1 Q. Okay. But you were not offering the
2 opinion that doing a Monte Carlo analysis is
3 infeasible for any other forecasts that may have
4 occurred in this proceeding; is that right?

5 MR. KUTIK: Objection.

6 EXAMINER PRICE: Sustained. You've made
7 your point. It's clear to me. It's clear to the
8 other examiners. It will be clear to the
9 Commissioners.

10 MR. FISK: Thank you, your Honor. Can we
11 go off?

12 EXAMINER PRICE: You may.

13 (Discussion off the record.)

14 EXAMINER PRICE: Let's go back on the
15 record.

16 MR. FISK: Thank you, your Honor.

17 EXAMINER PRICE: Mr. Fisk?

18 MR. FISK: Just a couple more questions.

19 Q. (By Mr. Fisk) Are you all set, Mr. Rose?

20 A. Yes.

21 Q. Okay. When did you start working on your
22 rebuttal testimony?

23 A. Sometime after the direct was filed.

24 Q. And you started working on it before the
25 supplemental testimony was filed in this proceeding;

1 is that right?

2 A. Yes.

3 Q. Okay. So probably sometime first quarter
4 or so of 2015?

5 A. Sometime between December 12 --
6 December 24, whenever the direct was filed, and the
7 supplemental.

8 Q. Okay. And when did you complete your
9 rebuttal testimony?

10 A. The day it was due.

11 Q. Okay, okay. So you were deposed about
12 three days after your rebuttal testimony was
13 completed; is that right?

14 A. Sounds approximately right, yes.

15 MR. FISK: Okay. I have nothing further
16 in the public.

17 EXAMINER PRICE: Okay. Thank you. At
18 this time we are going to break for lunch. We will
19 resume at 12:30 with Mr. Sauer and Ms. Fleisher and
20 Mr. Hays.

21 Let's go off the record.

22 (Thereupon, at 11:43 a.m., a lunch recess
23 was taken until 12:30 p.m.)

24 - - -

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1 Thursday Afternoon Session,
2 October 29, 2015.

3 - - -

4 EXAMINER PRICE: Let's go back on the
5 record.

6 Mr. Oliker.

7 MR. OLIKER: Thank you, your Honor. I
8 just wanted to bring to your attention there is a
9 dispute over a portion of the transcript that IGS
10 believes should be in the public record that the
11 companies continue to maintain should be held
12 confidential.

13 And this portion of the transcript
14 related to the cross-examination of Mr. Moul.
15 Specifically, I believe on page 2432, there was a
16 hypothetical asked to Mr. Moul discussing the metrics
17 that FirstEnergy Solutions would consider in closing
18 the power plant and he provided an answer to that
19 hypothetical and my concern is that this is in the
20 confidential record whereas in the public record
21 there is testimony from several FirstEnergy witnesses
22 including Mr. Lisowski indicating that if the plants
23 recover only avoidable costs, that they may still
24 retire the plants and also testify in the public
25 record that unless they receive their return of the

1 avoidable costs plus weighted cost of capital and
2 income taxes, then they -- they may close the plants.

3 So the main concern is there has been
4 lots of testimony about the metrics that the company
5 would consider in keeping the plants open or closed
6 but this one which is I think very important for the
7 Commission to consider is being kept in the
8 confidential record. It doesn't actually involve
9 specific FirstEnergy Solutions' numbers. It only
10 deals with a hypothetical situation regarding metrics
11 FirstEnergy Solutions would consider. And normally I
12 would not want to question the companies'
13 determination of what is confidential. I recognize
14 that's a sensitive subject. But because they are
15 willing to talk about it in several other instances
16 which serve their purposes, I think this also should
17 come into the public record.

18 EXAMINER PRICE: Mr. Lang.

19 MR. LANG: Thank you, your Honor.

20 The companies did review Mr. Olikier's
21 request. The decision was made based on a
22 combination of two factors. One is that because the
23 question was specific to certain cost categories, and
24 then combining that with the question that to
25 Mr. Moul was the forward-looking business

1 determination that would be made based on those
2 specific cost categories, the combination of those
3 two issues rendered his opinion confidential, and
4 that's why the companies believe that it should stay
5 in the confidential record.

6 It's certainly something that the
7 Commission can consider, certainly something
8 Mr. Olier can put in his brief marked as
9 confidential. I don't believe that having it
10 identified as confidential prevents it from being
11 considered by the Commission in any way.

12 So based on that determination of the
13 specificity of what he was answering, combined with
14 the forward-looking determination that he was making,
15 the companies determined and Mr. Moul believed that
16 it was confidential and should remain in the
17 confidential record.

18 EXAMINER PRICE: Well, this was something
19 that was done on the confidential transcript. It
20 relates to a confidential exhibit, and we are going
21 to err on the side of keeping it confidential. It
22 doesn't prejudice IGS at all. You can put it in your
23 redacted portion of your brief, which I suspect you
24 will have a redacted portion of your brief,
25 notwithstanding how I come out on this, and,

1 obviously, the Commission will have full access to
2 it.

3 The only person that makes life difficult
4 for are the examiners who are going to have to write
5 around this when we write our opinion and order.

6 MR. OLIKER: That was my concern.

7 EXAMINER PRICE: This is not the only
8 issue we are going to have to do that on, so I don't
9 know whether to call this -- whether you are making a
10 motion, but to the extent you are making a motion to
11 move this to the public transcript, it is denied.

12 MR. OLIKER: Thank you, your Honor.

13 EXAMINER PRICE: Mr. Sauer, before you do
14 your cross, there is actually one other piece of
15 housekeeping and deferred ruling we need to deal
16 with. We have deferred ruling on the admission of
17 OCC 6, Exhibit 6. At this time OCC 6 will be
18 admitted solely for the purpose of determining
19 whether the costs enumerated on the exhibit are
20 legacy costs or part of the legacy cost components.

21 MR. KUTIK: OCC 6, your Honor? Can you
22 describe that exhibit? Never mind. Thank you.

23 EXAMINER PRICE: Mr. Sauer.

24 MR. SAUER: Thank you, your Honor.

25 (EXHIBIT ADMITTED INTO EVIDENCE.)

CROSS-EXAMINATION

By Mr. Sauer:

Q. Good afternoon, Mr. Rose.

A. Good afternoon.

Q. Could you turn to page 28, line 22 of your rebuttal testimony.

MR. KUTIK: I'm sorry, what page?

MR. SAUER: 28, line 22.

A. Yes, sir.

Q. You state that coal sets the price in Ohio in most hours, correct?

A. Yes.

Q. And what hours does coal not set the price in Ohio?

A. Typically on-peak hours, especially during the seasonal periods when demand is high, like the summer, so that's a general rule. I mean, obviously, it varies. There's 8,760 hours in, you know, many locations in Ohio. But as a general rule, you are looking at on-peak and during the seasonal highs.

Q. And are the price levels typically lower when coal is setting the price?

A. Yes.

Q. And if coal is not setting the price in

1 Ohio, is it natural gas that will be setting the
2 price in Ohio?

3 A. In many hours, yes. It can also be oil.
4 There are peaking units that use oil as well, and the
5 price will reflect not only the fuel but other
6 factors as well.

7 Q. For generating units are the net revenues
8 available to them generally more substantial during
9 the hours that natural gas resources are setting the
10 price?

11 A. It depends on the generating unit. Can
12 you be more specific, please?

13 Q. For example, a coal-fired generating
14 plant, are the revenues available to them more
15 substantial during hours that natural gas resources
16 are setting the price?

17 A. Yes. In a general manner, yes.

18 Q. How about for a nuclear unit?

19 A. Yes.

20 Q. Could you turn to page 5, please, lines
21 24 to 25.

22 A. Yes, sir.

23 Q. In that section of your testimony you
24 state that futures prices reflect bids, not
25 transactions. Is that an accurate statement?

1 A. What it says is that "the long-term
2 futures prices primarily reflect bids, not
3 transactions," and so I am referring to long term,
4 particularly after year five.

5 Q. And if you look at page 40, lines 9 to
6 10 -- are you there?

7 A. Yes, sir.

8 Q. In that section you state that "reported
9 prices are primarily offers." Do you see that?

10 MR. KUTIK: I'll object, your Honor.

11 EXAMINER PRICE: Grounds?

12 MR. KUTIK: Well, he only read part of
13 the sentence, which is clearly modified by the words
14 before, which are "beyond the first few years."

15 EXAMINER PRICE: Sustained.

16 Why don't you rephrase, Mr. Sauer.

17 MR. SAUER: All right.

18 Q. (By Mr. Sauer) On page 40, lines 9 to 10,
19 it states there that more -- beginning at line 7 it
20 states, "Moreover, as it turns out and as described
21 below, the figures shown in the graphic greatly
22 overstate the period for which there is reliable
23 NYMEX forward price data, because beyond the first
24 few years the reported prices are primarily offers,
25 not actual transactions; there are a few if any

1 transactions." Is that correct?

2 A. You read that correctly, sir.

3 Q. If the price is set primarily by
4 offers -- let me ask it this way. If you are saying
5 the price is being set by offers, are offers being
6 provided by commodity sellers?

7 MR. KUTIK: I'll object. I don't think
8 he said anything about prices being set. He is
9 talking about prices that are reported.

10 EXAMINER PRICE: Sustained.

11 Q. Okay. Are the prices reported
12 represented by offers that are being offered by
13 sellers?

14 A. It can be, but it can also be bids by
15 buyers as well.

16 Q. So when you are using the term "offers,"
17 is it interchangeable, offers being -- offers by
18 sellers or buyers?

19 A. In this particular context in the long
20 term where I'm talking about the lack of
21 transactions, I am talking about bids and asks that's
22 been established, which involves both sellers and
23 buyers.

24 Q. If you turn to page 6, lines 19 to 20,
25 where you had modified your testimony earlier today,

1 you say, "Shale gas well production has increased
2 dramatically." Do you see that?

3 A. Yes, sir.

4 Q. When you say "shale gas well production
5 has increased dramatically," referring to the
6 Marcellus shale?

7 A. Not exclusively. I am referring to shale
8 gas in general. That's the largest source of shale
9 gas and the largest source of gas right now, but it's
10 not limited to that.

11 Q. So the Utica shale region has also
12 experienced a dramatic increases in shale gas
13 production as well?

14 A. Well, I think what I would say with
15 respect to the Utica is it has seen increases that
16 are significant, particularly given its low base.
17 Utica is small compared to Marcellus. Utica is about
18 2 bcfd versus Marcellus at 15, the total of which I
19 sometimes I combine and, I footnoted that.

20 The biggest increases in the total amount
21 of shale and gas in the Marcellus. So I can't
22 really -- I just don't think that's the way to
23 describe it. The best way to describe it is as I did
24 because Utica is much smaller than Marcellus.

25 Q. If you could turn to page 13, lines 18 to

1 19, carrying over -- and also on page 14, lines 10
2 to 11 --

3 MR. KUTIK: I'm sorry. Are you referring
4 to the entire passage bounded by those references?

5 MR. SAUER: Yes.

6 A. In looking at pages 13 to 14, are there
7 particular lines?

8 Q. Well, if you look at your discussion at
9 the very top of page 13, lines 18 and 19, you said,
10 "Neither witness even mentions key developments
11 related to capacity prices even though those
12 developments predate their filing of testimony." Do
13 you see that?

14 A. Yes.

15 Q. And you're critiquing Mr. Wilson and
16 Mr. Comings both in that location, are you not?

17 A. Yes, sir.

18 Q. And are you referring to what was called
19 the capacity performance; is that what you are
20 suggesting Mr. Wilson didn't mention in his
21 testimony?

22 A. That's part of it, but it's not limited
23 to that. The developments in the PJM capacity market
24 are -- include the capacity performance, and that's a
25 significant development, but there are other

1 developments that go back even further related to
2 demand resources, for example, and other changes, so
3 I'm not limiting to that or that's the most important
4 development.

5 MR. SAUER: All right. May I approach,
6 your Honor?

7 EXAMINER PRICE: You may.

8 MR. SAUER: I don't need to mark this.
9 It's just an except from Mr. Wilson's testimony.

10 Q. Mr. Rose, did you read Mr. Wilson's
11 testimony?

12 A. I did.

13 Q. And if you look at question and answer
14 73, it starts at the bottom of page 53 and carries
15 over to page 54, would you agree Mr. Wilson is
16 discussing capacity performance in his testimony at
17 that point?

18 A. Yes, I see that it's there in the
19 footnote, but I don't think he discusses it in terms
20 of the impacts on capacity prices.

21 Q. And in your rebuttal testimony at page
22 18, lines 15 to 18 -- are you there?

23 A. Yes, sir.

24 Q. Do you agree with Mr. Wilson that when
25 energy prices rise, capacity prices would be expected

1 to fall due to lower missing money, all other things
2 equal?

3 MR. KUTIK: May I have the question read,
4 please.

5 EXAMINER PRICE: You may.

6 THE WITNESS: I'm sorry, I didn't hear.

7 MR. KUTIK: The question is going to be
8 reread.

9 EXAMINER PRICE: She going to read the
10 question out loud.

11 (Record read.)

12 MR. KUTIK: Excuse me. I'm sorry, your
13 Honor, I am still not sure what the question is.

14 EXAMINER PRICE: He is asking if he
15 agrees with Mr. Wilson's statement.

16 MR. KUTIK: Well, I am not sure what
17 statement is being agreed to. It seemed garbled when
18 I hear it, and we didn't get a good transcript of it.

19 EXAMINER PRICE: I think the transcript
20 is exactly what he said.

21 MR. KUTIK: Okay.

22 EXAMINER PRICE: Let's have the question
23 back again.

24 (Record read.)

25 A. I don't think that's a fair

1 characterization of Mr. Wilson's testimony. First of
2 all, he changes electrical energy prices, and that
3 doesn't -- in the long run that doesn't change
4 capacity prices, was one of my criticisms.

5 Then he says, well, you can't have
6 capacity and energy prices going up together in the
7 near term and later changes his mind and says you
8 can. And, in fact, the changes in the market
9 structure, the lack of suppression of capacity prices
10 causes them to both go up together.

11 The inverse relationship only occurs in
12 long-term equilibrium. He forgot to include it in
13 his forecast, and I do address it.

14 Q. I'm not sure if I got an answer to my
15 question. Do you agree that when energy prices rise,
16 capacity prices would be expected to fall? How about
17 that?

18 A. I don't agree with that statement without
19 fuller explanation, which is the equilibrium in the
20 long-term changes in energy prices inversely relate
21 to capacity prices, all else being equal. In the
22 near term they don't have to go in that same
23 direction, have that same relationship.

24 In fact, my testimony is the opposite,
25 that there's an anomalous situation that we are going

1 through right now where major deficiencies and flaws
2 in the capacity market design are in the process of
3 being corrected. In that circumstance the inverse
4 relationship doesn't hold. In fact, it would be
5 expected to move together.

6 Q. And you're saying that's for the near
7 term?

8 A. Yes, for the period in the near term,
9 yes.

10 Q. So for the longer term, would you agree
11 that when energy prices rise, capacity prices would
12 be expected to fall?

13 A. All else being equal and in the longer
14 term when you're in equilibrium, balanced between the
15 demand for capacity and supply for capacity.

16 Q. Do you know if in Mr. Wilson's analysis
17 his energy prices rise over time?

18 A. The calculations or the numbers that I've
19 seen do show increases in the 2016 to 2023 period.
20 Those are the ones I remember sitting here.

21 Q. Would you agree that in the time period
22 you just mentioned between 2016 and 2023,
23 Mr. Wilson's energy prices rose over 30 percent?

24 A. No.

25 Q. And do you happen to know if Mr. Wilson

1 used capacity prices that rise in the future?

2 MR. KUTIK: I'm sorry, may I have the
3 previous question and answer read?

4 EXAMINER PRICE: You may.

5 (Record read.)

6 MR. KUTIK: And I apologize. I think
7 there is a question pending.

8 EXAMINER PRICE: Let's have the last
9 question back, please.

10 (Record read.)

11 A. Yes. My understanding is he used the
12 same capacity prices as I forecast, and my problem
13 was when he changed the energy prices in the long
14 run, but he didn't change the capacity price. And so
15 he lowered the energy prices without raising the
16 capacity prices. That was my concern there. It
17 refers to the long-term equilibrium, not just any
18 period.

19 Q. And your capacity prices that you
20 forecasted rose in the future; is that correct?

21 A. Yes. So the -- in my testimony I refer
22 to prices being around 81 -- increasing \$81 a
23 megawatt-day, increasing over time from that level,
24 sure.

25 Q. If you can turn to page 31, lines 1 to 3

1 of your testimony --

2 A. Page 31, lines 1 through 3, did you say?

3 Q. I think so. Let me make sure I have got
4 the right reference here. I think it's actually page
5 33. I am looking at Figure 2, your "U.S. Oil and Gas
6 Rig Count."

7 A. Okay.

8 Q. Looking at the natural gas recount chart
9 on Figure 2, it possible that exploration and
10 development are becoming more efficient and --

11 EXAMINER PRICE: Are you done with your
12 question?

13 MR. SAUER: Yes, I'm sorry. That was my
14 question.

15 MR. KUTIK: There was an "and" at the
16 end.

17 MR. SAUER: No. If there was, you can
18 strike it.

19 EXAMINER PRICE: We are striking the
20 "and."

21 A. I am not sure what time period you are
22 referring to, but I wouldn't say that it's possible.
23 It's something that has happened as a historical
24 fact, so it's more than possible, but I'm a little
25 bit confused with the question.

1 Q. Well, I am trying to reconcile the
2 statement on page 6 where you say that "Shale gas
3 well production has increased dramatically" and the
4 recounts are going down. I am just trying to
5 understand if the -- while the recounts may be down,
6 due to efficiency and productivity that you are
7 seeing greater natural gas production from fewer
8 wells.

9 MR. KUTIK: I'm sorry, is this a question
10 to the witness, your Honor?

11 EXAMINER PRICE: I think he's trying to
12 clarify his previous question. The witness indicated
13 he was confused by Mr. Sauer's question, so
14 Mr. Sauer's previous question I think Mr. Sauer is
15 trying to clarify for him.

16 MR. SAUER: I'm trying.

17 MR. KUTIK: I am not sure the record is
18 clear what the question is to the witness.

19 EXAMINER PRICE: Maybe you can rephrase,
20 Mr. Sauer.

21 MR. SAUER: I'll rephrase.

22 Q. (By Mr. Sauer) Given your statement on
23 page 6 that "Shale gas well production has increased
24 dramatically," would you agree that a reduction in
25 recounts is showing that natural gas exploration and

1 development are becoming more efficient and thereby
2 bringing on more supply through fewer rigs?

3 A. I think the -- it is the case that there
4 is more efficiency in the production of shale gas
5 over time. And I think this graph is showing both
6 oil- and gas-directed drilling rigs. But I think
7 that the reason I talk in the testimony about both
8 oil and gas is that in a lot of circumstances, it's
9 best to look at them in total. You add the two
10 together, the oil and the gas rigs.

11 So while -- and the reason for that is
12 it's a self-described situation, whether you describe
13 yourself as an oil and gas, you have your own
14 definition on that. So there is a lot of wells that
15 are doing both or producing various different
16 products.

17 If you look at the sum of the two over
18 time, it is enough to indicate that there has been
19 some improvement in productivity, but the improvement
20 in productivity doesn't explain what's happened since
21 the middle of last year. Or the sum of the two, as I
22 describe in my testimony, have gone down by about
23 60 percent, or in that order.

24 So the total amount of rigs in the last
25 12 to 18 months has gone down 60 percent, and there's

1 no enhancement in productivity that could offset
2 that. There can be a drawdown of inventory, but
3 there's no evidence that there is anything could be
4 even close to offsetting a 60 percent drop in the
5 total rig count.

6 And we know that because the measures of
7 productivity generally are increasing a few percent
8 per year, at least nationwide, and nothing on the
9 order that could explain the 60 percent drop.

10 MR. OLIKER: Could I have just the
11 question read back, again, please.

12 EXAMINER PRICE: You may.

13 (Record read.)

14 MR. OLIKER: I would move to strike his
15 answer which was responsive maybe, in part, to that
16 question, and then there was a whole lot of something
17 else in there.

18 EXAMINER PRICE: I think Mr. Sauer asked
19 a very broad question and got a very broad answer.
20 Denied.

21 Q. (By Mr. Sauer) Mr. Rose, have you
22 examined the total quantity of production associated
23 with the exploration activity that's shown on Figure
24 2 or the rig count activity shown on Figure 2?

25 A. Yes.

1 Q. And is it up or down? Do you know?

2 THE WITNESS: I'm sorry, could I have the
3 previous question read back?

4 EXAMINER PRICE: Yes.

5 (Record read.)

6 A. Yes. I'm a little bit confused here as
7 to what the question is.

8 Q. You said you've reviewed that quantity of
9 production associated with the activity, the recount
10 activity on Figure 2, correct?

11 A. Yes.

12 Q. And I just asked you if that activity
13 is -- is that up or down, production activity?

14 A. Production activity is up. I believe I
15 will leave it at that.

16 Q. And page 36, lines 4 to 5, and there
17 you're saying, "This is another sign that the level
18 of prices is too low to support the level of current
19 demand." Do you see that?

20 A. Yes, sir, I do see that.

21 Q. Do you perhaps mean that the level of
22 prices are too low to support supply?

23 A. The prices are too low to get -- to on a
24 sustained basis meet the demand and certainly to meet
25 the massive, massive historical -- historically

1 unprecedented increase in gas demand that's underway
2 right now.

3 Q. The natural gas prices you used in your
4 forecast, were you basing that off the Henry Hub
5 natural gas prices?

6 A. The model that we used is forecasting
7 simultaneously all of the prices. I report Henry Hub
8 because that's the standard marker location.

9 Q. But you are also modeling Dominion South
10 Point as well?

11 A. Yes.

12 Q. And locationally do you know where
13 Dominion South is?

14 A. Yes.

15 Q. And where is that?

16 A. The Dominion South area approximately
17 covers areas in southern West Virginia, southeastern
18 Ohio, areas like that.

19 Q. And how do the natural gas prices in --
20 in Dominion South Point compare to prices at Henry
21 Hub?

22 A. Over -- over what period?

23 Q. Just say today.

24 A. Today, I haven't seen the paper today.
25 But, in general, they have been lower than Henry Hub

1 in the last few months.

2 Q. And do you know order of magnitude how
3 much lower they have been?

4 A. Fifty cents to a dollar order. I mean,
5 order of magnitude means 10 times, so it is
6 definitely not an order of magnitude. It's best to
7 describe it as 50 cents to a dollar lower on average.

8 Q. Okay. Were you done?

9 A. Yes.

10 Q. I didn't mean to interrupt you. Have you
11 seen forecasts for differences in natural gas prices
12 between Henry Hub and Dominion South Point over the
13 next two years?

14 A. Yes.

15 Q. And what are those forecasted
16 differences, as you recall?

17 A. I don't have those specific numbers.
18 Generally we -- ICF is forecasting some closing over
19 time of the gap between Henry Hub and Dominion South.

20 Q. The prices, the forecasted prices that
21 you've seen, are they generally staying within that
22 50 cents to a dollar basis differential difference
23 between now and the next couple of years?

24 A. I would have to take a look to get the
25 actual numbers.

1 MR. SAUER: May I approach, your Honor?

2 EXAMINER PRICE: You may.

3 Mr. Sauer, are you asking this to be
4 marked, or are you giving this to refresh his
5 recollection?

6 MR. SAUER: We will go ahead and mark it,
7 I think, OCC Exhibit 33.

8 EXAMINER PRICE: It will be so marked.

9 (EXHIBIT MARKED FOR IDENTIFICATION.)

10 Q. Mr. Rose, are you familiar with the CME
11 group?

12 A. Yes.

13 Q. And are you familiar with the information
14 that's shown on the document that's been marked as
15 OCC Exhibit No. 33?

16 A. No.

17 Q. The document titled "Dominion South Point
18 Natural Gas (Platts IFERC) Basis Futures
19 Settlements." Do you see that?

20 A. I see that's what it says, yes.

21 Q. All right. And if you look, the first
22 column is "Month," "November 15," and do you see the
23 "Settle" column.

24 A. I see the Settle column, and I think you
25 said the -- I think you said and there is a row that

1 says "November 15."

2 Q. November 15 is a row, and then there is a
3 column that is headed "Settle."

4 A. I see that.

5 Q. And do you know what that would generally
6 refer to?

7 MR. KUTIK: Objection.

8 EXAMINER PRICE: Grounds?

9 MR. KUTIK: Foundation.

10 EXAMINER PRICE: Sustained.

11 Q. When you say you were familiar with
12 generally the basis differential prices between Henry
13 Hub and Dominion South Point, you were suggesting
14 that the basis differentials were somewhere in the
15 neighborhood of 50 cents to a dollar difference,
16 correct?

17 A. Yes, in the near term, and that it was
18 decreasing over time.

19 Q. Okay.

20 A. Which these numbers are, but I haven't
21 seen them before. And you can see there is almost no
22 volume on them either, and they are not forecasts.
23 They are basis futures or forwards.

24 Q. And when you are relying -- when you are
25 trying to determine the basis differential between

1 Henry Hub and Dominion South Point, what information
2 would you rely on to try to identify what that
3 difference would be?

4 A. Two sets of information. One, we would
5 look at basis information for the short term, the
6 near term, maybe a year or two. It would depend on
7 the circumstances how much credence we gave to it.
8 You can see here we talked earlier about transactions
9 versus bids, and there is almost no volume. That's
10 one set of information.

11 Another set of information, which I was
12 referring to earlier, our model is forecasting this
13 particular basis. It's forecasting simultaneously
14 all the bases in the country, so it has a locational
15 price for all the locations, and that's showing a
16 decrease, as I recall, in the basis difference,
17 like -- I don't remember sitting here exactly what
18 those numbers are.

19 And the reason for that is that there is
20 infrastructure changes that are occurring, so we
21 would also look at what's driving the model results,
22 which include demand and supply and infrastructure,
23 between the various different subsegments of the
24 natural gas system and delivery system.

25 Q. So are the recent developments that make

1 this price point relatively more important for Ohio
2 natural gas pricing, such as infrastructure that you
3 were talking about?

4 A. Yes. I mean, one of the main findings is
5 that there's not a lot of impact on -- from gas
6 prices on power prices, on electrical energy prices
7 in the near term. And part of the muting is related
8 to lack of infrastructure, both in terms of
9 consumption and movement of the price. That's why
10 there is such a muting on the near term.

11 Over time there is going to be
12 infrastructure that will close the gap between
13 regions, and there will be infrastructure related to
14 the use of the gas and that infrastructure -- those
15 infrastructure changes could make it more important
16 over time for Ohio.

17 Q. I want to ask you a few questions about
18 the CO-2 regulations. Is it true that market
19 participants are already making decisions that factor
20 in the impacts of the carbon regulations?

21 A. There is some consideration ongoing on
22 the part of participants with respect to the
23 regulations.

24 Q. And would you believe that recent
25 retirements of coal plants reflect to some extent the

1 possibility of the future carbon regulations?

2 A. I think it depends on the plant and
3 it's -- to the extent that it is -- which it
4 sometimes is. It's one of many considerations.

5 Q. But it is a consideration you believe
6 that has impacted some of the recent coal plant
7 retirements.

8 A. Yes. I think it's a secondary
9 consideration to some of the other considerations,
10 typically, the mercury and air toxic regulations.
11 But in my experience it has been a contributing --
12 something that's given weight, although less weight
13 than other regulations.

14 MR. SAUER: Your Honor, that's all the
15 questions I have in the public session.

16 EXAMINER PRICE: Thank you.

17 Mr. Stinson?

18 MR. STINSON: No questions, your Honor.

19 EXAMINER PRICE: Ms. Fleisher?

20 MS. FLEISHER: Thank you, your Honor.

21 - - -

22 CROSS-EXAMINATION

23 By Ms. Fleisher:

24 Q. Mr. Rose, can you turn to page 12, line
25 16 to 17 of your rebuttal testimony.

1 A. Page 12, lines 16 and 17?

2 Q. Yes. And here I believe you are
3 indicating that it's uncommon to use sensitivity
4 cases, especially in regulatory proceedings, correct?

5 A. No.

6 Q. And do you believe it is uncommon to use
7 sensitivity cases in regulatory proceedings?

8 A. There are many regulatory proceedings in
9 which it doesn't happen, I think is the better way to
10 respond to that. It's a little bit -- in terms of
11 measuring the frequency, it's -- it can depend on
12 what type of proceedings.

13 I do point out on this page that in the
14 three major environmental regulations in which it's
15 being analyzed using similar models, in fact, the
16 same model, there is no sensitivities provided for
17 economic conditions.

18 Q. And you are referring to the regulatory
19 impact analyses for the Clean Power Plan, the Mercury
20 and Air Toxics Standard, and the Cross-State Air
21 Pollution Rule, correct?

22 A. Yes.

23 MS. FLEISHER: May I approach?

24 EXAMINER PRICE: You may.

25 MS. FLEISHER: We will do three at once

1 here. These are the regulatory impact analyses
2 for -- or excerpts of them for the Cross-State Air
3 Pollution Rule, the Mercury and Air Toxics Standard,
4 and the Clean Power Plan.

5 MR. KUTIK: Your Honor, I have no idea
6 what she is saying.

7 EXAMINER PRICE: What she said was it is
8 the cross -- she is passing out the Regulatory impact
9 Analysis for the Cross-State Air Pollution rules, the
10 Mercury and Air Toxics Standards, and the Clean Power
11 Plan.

12 MS. FLEISHER: And let's do these as ELPC
13 Exhibits 24 through 26, 24 being the Clean Power
14 Plan, 25 being the Cross-State Air Pollution plan,
15 and 26 being the mercury ruling.

16 EXAMINER PRICE: They will be so marked.

17 (EXHIBITS MARKED FOR IDENTIFICATION.)

18 MR. FLEISHER: I would note for the
19 record, I think I mentioned these are not the full
20 documents, for the sake of saving trees, and I
21 believe that the executive summary and one chapter of
22 the Clean Power Plan has already been admitted as
23 Sierra Club Exhibit 64, and so this is a separate
24 excerpt from that document.

25 Q. (By Ms. Fleisher) Mr. Rose, let me know

1 if you want time to just browse through, but do you
2 recognize these as the regulatory impact analyses or
3 excerpts thereof for the rules that you mentioned in
4 your testimony?

5 A. One second, please.

6 MR. KUTIK: Your Honor, I would just note
7 some of these pages appear to be cut off. Hopefully
8 we won't have to delve into those issues, your Honor.

9 EXAMINER PRICE: Yes. I understand. I
10 can see the problem.

11 MS. FLEISHER: Oh, the printing.

12 EXAMINER PRICE: They're not great
13 copies, but let's just persevere.

14 MS. FLEISHER: If needed, I can reprint.
15 I am not sure if there was some problem with the
16 printer, but I can certainly provide better copies as
17 needed.

18 EXAMINER PRICE: If it's necessary,
19 provide a clean copy just to the reporters so the
20 record is clear.

21 MS. FLEISHER: Sure. I'll do that. I
22 don't think it should be an issue for purposes of my
23 questions, but, obviously, he can raise that.

24 A. I mean, they look like the excerpts with
25 the caveat not all the pages and et cetera, that

1 sometimes it is hard to read so. It does look
2 somewhat familiar.

3 Q. And have you reviewed these documents
4 before?

5 A. I have seen them. My focus of my review
6 is on only parts, but I have some familiarity with
7 these documents.

8 Q. Okay. And is it your understanding that
9 these present an explanation of the costs, potential
10 costs and benefits of the rules in question?

11 A. The materials do seem to address those
12 issues. I'm not a specialist in the benefits of the
13 regulations. I know there is a lot of dispute about
14 that. But they do seem to address those issues.

15 Q. Do you have an understanding what the
16 regulatory impact analysis is for?

17 A. Yes.

18 Q. What's the understanding?

19 A. It's trying to assess the impacts of the
20 regulations on various different parameters,
21 including the industries that are affected.

22 Q. And would you agree that for these rules,
23 the benefits come mainly in the form of avoided
24 pollution and resulting avoided health impacts?

25 A. I would say yes, but I'm not an expert in

1 the benefit side of these regulations.

2 Q. And are you familiar with the role that
3 natural gas and energy prices play in these
4 documents?

5 A. Can you be more specific?

6 Q. Are natural gas and energy prices used as
7 inputs to IPM modeling in these documents?

8 A. Natural gas prices are an output of IPM.
9 And if you have a specific reference, that would be
10 helpful.

11 Q. I'm just asking for your general
12 understanding. If you don't know, that's fine.

13 MR. KUTIK: That's not what he said, so I
14 object to the characterization.

15 EXAMINER PRICE: Sustained. He didn't
16 say he didn't know.

17 MS. FLEISHER: I was just saying if you
18 don't know, that's fine. Yeah. I didn't mean to
19 characterize his testimony. And for the exhibit
20 marked as ELPC 24, can you turn --

21 MR. McNAMEE: Which one is that?

22 MS. FLEISHER: Sorry. The Clean Power
23 Plan is 24; the Cross-State Air Pollution rule is 25;
24 and the mercury rule is 26.

25 Q. So for Exhibit 24, the Clean Power Plan

1 RA, can you look at the tables on pages 4-23 and
2 4-24?

3 MR. KUTIK: I would just note, at least
4 on my copy, your Honor, page 4-24 is somewhat
5 obscure.

6 EXAMINER PRICE: I understand.

7 MR. KUTIK: As long as the witness
8 doesn't have a problem, I don't have a problem.

9 EXAMINER PRICE: We will persevere though
10 it, and, again, like I said, just to be -- to close
11 the loop on this, Ms. Fleisher will file after the
12 hearing as late-filed exhibits new copies, clean
13 copies of both -- all three of these documents, and
14 then the record will be clear.

15 MS. FLEISHER: Certainly.

16 THE WITNESS: Can I have the question
17 reread to me.

18 EXAMINER PRICE: Yes.

19 (Record read.)

20 THE WITNESS: Yes, I believe I can look
21 at them.

22 EXAMINER PRICE: Ms. Fleisher, you can
23 proceed.

24 Q. (By Ms. Fleisher) Would you agree that
25 these tables present ranges of estimates of benefits

1 per ton of pollutant reduction?

2 A. Yes. But I'm agreeing on that just based
3 on what it says in the title. I'm not a specialist
4 in benefits.

5 Q. Okay. So you weren't aware of how this
6 RIA treated benefits when you were preparing your
7 testimony?

8 A. I had some very general knowledge. I am
9 not a specialist in benefits, and I wasn't referring
10 to them. I was referring to the type of analysis
11 that I have been doing in this case, and it's related
12 to the cost and other issues related to what goes on
13 in the power and coal industries and I wasn't -- I
14 didn't intend to refer to this set of material at
15 all.

16 MS. FLEISHER: Your Honor, I would move
17 to strike everything after the initial answer as to
18 whether he was actually aware.

19 MR. KUTIK: Your Honor, I think what he
20 talked about was his awareness which he did talk
21 about how it factored into his testimony.

22 EXAMINER PRICE: We are going to deny the
23 motion to strike. I think he was just trying to
24 respond to your question.

25 MS. FLEISHER: Thank you, your Honor.

1 Q. (By Ms. Fleisher) And do you have any
2 general understanding of how RIAs treat uncertainty
3 in the estimates they are presenting?

4 A. Can you be more specific? Are you
5 talking about the uncertainties in benefits?

6 Q. I'm talking about any uncertainties in
7 these analyses.

8 MR. KUTIK: When you say "these" -- when
9 she says "these analyses," your Honor, what does that
10 mean?

11 Q. (By Ms. Fleisher) I am just -- I am
12 asking an open-ended question because I'm seeking the
13 full answer of what you know about how a regulatory
14 impact analysis treats uncertainty.

15 A. In an open-ended response, what I am
16 focusing on is the type of IPM modeling that's
17 related to economic sensitivities, and I have not
18 addressed anywhere the issue of benefits and I don't
19 consider myself a specialist in that area, and so I
20 have only limited knowledge of the material that you
21 have given me.

22 Q. So your testimony regarding these
23 regulatory impact analyses is intended only to speak
24 to the use of the particular kind of modeling that
25 you performed in this case?

1 A. My testimony relates to economic
2 sensitivities that are driving the models like IPM
3 and not related to the impacts of PM 2.5, which I
4 don't think I have ever mentioned in my testimony or
5 even in any deposition or anything like that, or
6 ozone code benefits. It's just areas I just am not
7 involved in.

8 EXAMINER PRICE: I just have to ask a
9 follow-up, just so the record is clear. What you
10 are -- tell me if my understanding of your testimony
11 is incorrect. On page 13, at line 2, when you
12 testify about economic sensitivities for these three
13 EPA rules, you were solely testifying as to the
14 outputs regarding energy prices coming from your
15 modeling that goes into whatever other analysis the
16 U.S. EPA does; is that correct?

17 A. Yes. In the sense that everything you
18 said was correct, but it wasn't just energy price, it
19 was things like what are power plants doing, their
20 performance and characteristics, other prices, et
21 cetera. But it wasn't really related to any of this
22 material, which is very removed from the work that we
23 are doing with IPM, for example.

24 EXAMINER PRICE: Okay. Thank you.

25 Q. (By Ms. Fleisher) And for the Clean Power

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1 Plan RIA, can you describe what role the IPM modeling
2 that ICF did plays?

3 A. The -- the part of the analysis, IRA ICF
4 was involved in that I am referring to is related to
5 the operation of the IPM model and it is assessing
6 what are the cost and performance outcomes, the price
7 outcomes, and the direct emission outcomes of power
8 plants. And so the model will be run in a base case,
9 and it will be run in a case in which they've
10 implemented the regulation, and that's the work that
11 we are doing.

12 And they are not doing a gas price
13 sensitivity, demand sensitivity. They are reporting
14 one case with one set of economic assumptions for a
15 given regulation, and that's the work that I am
16 referring to.

17 Q. And that would -- would that be a similar
18 role that the IPM modeling plays for the CSAPR and
19 MATS RIAs.

20 A. Yes.

21 Q. In preparing your testimony on pages 12
22 and 13 regarding, whether it's standard or typical
23 for sensitivity analysis to be used, did you review
24 any utility commission proceedings involving a
25 long-term power purchase agreement?

1 A. No, I did not. What I say is that
2 sensitivity cases are often not used, and then I
3 presented three examples of large complicated
4 analyses that involved. I haven't done a
5 comprehensive literature search.

6 MS. FLEISHER: May I approach, your
7 Honor?

8 EXAMINER PRICE: You may.

9 MS. FLEISHER: And this document has
10 previously been admitted as ELPC Exhibit 5. It's a
11 decision of the Connecticut Public Utilities
12 Commission.

13 and, Mr. Rose, if you would just --

14 MR. KUTIK: May we have a minute, your
15 Honor?

16 EXAMINER PRICE: Yes.

17 Let's go off the record.

18 (Discussion off the record.)

19 EXAMINER PRICE: Go back on the record.

20 A. What's the question?

21 Q. I was just wondering whether you are
22 familiar with the request for proposal and capacity
23 contracts discussed in this document?

24 A. I have some knowledge of this involving
25 clean energy combined cycle, et cetera. I have some

1 knowledge, but I am not sure I have ever seen this
2 document before though. I don't believe so.

3 Q. Okay. And if you go to number --
4 numbered page 2 at the top, footnote 1.

5 A. I see footnote 1.

6 Q. To the extent you are familiar with
7 this -- I am just going to call it a transaction, for
8 ease of reference. Are you familiar with the
9 performance of the range of market modeling scenarios
10 to calculate potential benefits to ratepayers from
11 this transaction?

12 A. I have some limited knowledge. It's
13 from -- I haven't looked at it in years but I have
14 some very limited knowledge, and I have never seen
15 this document before.

16 Q. But you were aware that there were
17 different market scenarios run for purposes of
18 determining potential benefits of this transaction?

19 A. I remember that there was an LEI analysis
20 and, I don't remember that much about it except that
21 there was some aspects of it that were -- were
22 problematic, that's what they're called. That's what
23 I recall, but I don't remember very much about it.

24 Q. Sorry, did you say "LEI"? Can you
25 just -- is that an acronym? Can you tell me what it

1 means?

2 A. It's LEI refers to London Economics, and
3 I believe I just saw a reference to that in here.

4 Q. That's fine. I'm just trying to clarify.

5 MR. KUTIK: Let him finish his answer,
6 your Honor, if he can.

7 Q. I'm sorry. I didn't mean to interrupt.
8 Were you referring to, just to speed things up, page
9 1 under Roman numeral III?

10 A. Yes. The LEI report. And so what I
11 remember about that is there was no nodal pricing
12 that was done in that analysis, so it was more
13 simple. It was focused in on just a limited regional
14 area and a lot of the focus was on buy-side
15 power-market issues.

16 MS. FLEISHER: Your Honor, I would move
17 to strike after -- I think he did say "yes," with
18 respect to the LEI acronym. Everything else I think
19 was nonresponsive to my question.

20 EXAMINER PRICE: I've obviously lost
21 track of what your question was as we were
22 discussing.

23 MS. FLEISHER: We can look back, but I
24 believe it was what LEI stood for.

25 EXAMINER PRICE: Well, but I think he

1 was -- no. Fair enough. We are just going to let
2 the -- we are going to deny your motion to strike.

3 MS. FLEISHER: Okay. Thank you, your
4 Honor.

5 Q. (By Ms. Fleisher) All right. And,
6 Mr. Rose, if you could turn to your rebuttal
7 testimony page 34, Figure 3.

8 A. Yes, ma'am.

9 Q. I believe in your corrections you
10 indicated that you wanted to add a source for that as
11 ICF International; is that correct?

12 A. Yes.

13 Q. And what document particularly is that
14 from?

15 MR. KUTIK: Well, I object. It assumes
16 from "a document."

17 A. Is there -- these come from a --

18 MR. KUTIK: Mr. Rose --

19 EXAMINER PRICE: You have a pending
20 objection so you should not answer.

21 MS. FLEISHER: I am happy to rephrase.

22 EXAMINER PRICE: If you could rephrase a
23 more broader question.

24 MS. FLEISHER: Certainly.

25 Q. (By Ms. Fleisher) Mr. Rose, what specific

1 source is this from at ICF International?

2 A. It's from ICF's Detailed Production
3 Report, I believe is the name for it.

4 Q. Is that a publicly available document?

5 A. No.

6 Q. And do you know the date of the Detailed
7 Production Report this is from?

8 A. This is an excerpt from Q2 2015.

9 Q. And for the year of production X axis, do
10 you know which years that covers?

11 A. It's a generic coverage, so it's the
12 first year of any -- in this case, Marcellus shale
13 well, and then the second year and the third year, so
14 it will be a function of what year in terms of
15 calendar years when the actual well drilling and
16 completion occur.

17 Q. Okay. I guess I am seeking clarity.
18 Does this include forecasts for future years for
19 these wells?

20 MR. KUTIK: Objection.

21 EXAMINER PRICE: Grounds?

22 MR. KUTIK: Mischaracterizes the figure.
23 The figure is showing a decline curve for wells. As
24 this witness has indicated, it's a generic curve to
25 show the depletion curve for a particular well or for

1 a particular type of well.

2 EXAMINER PRICE: I don't think she was
3 mischaracterizing his testimony, so I think she was
4 simply asking a different question. Overruled.

5 A. This well declining curve would apply, as
6 you can see in the next page, to wells drilled over
7 the next, you know, 10 to 15 years, and it's partly a
8 function of the underlying geology and the pressures
9 that you have in the wells and the throughput that
10 you have on the well.

11 Q. All right. And can you go to page 36 of
12 your rebuttal testimony, lines 5 and 6.

13 A. Yes, ma'am.

14 Q. Where it says "Planned exploration and
15 production capital expenditures for 2015 are down
16 30-40 percent versus the 2014 level." What's the
17 basis for that statement?

18 A. General knowledge of the industry.

19 Q. And for the 2015 expenditures, is that
20 all of 2015 to date or a particular time segment
21 within 2015?

22 A. It's more through -- through mid -- early
23 to mid 2015.

24 Q. And does this pertain solely for the
25 Marcellus shale or the United States generally?

1 A. This is to the U.S. generally.

2 Q. And can you go to page 38 of your
3 rebuttal testimony, please. For the bullet point
4 "Industrial Consumption," what's the basis of that
5 information in that bullet point?

6 A. General knowledge from around that same
7 period of time.

8 Q. Including the \$138 billion number?

9 A. Yes, from around mid -- as of mid 2015.

10 Q. But it's not from any particular
11 document?

12 A. Not that I remember. It may have been
13 but I don't remember.

14 Q. And for the bullet -- the "Ammonia"
15 bullet point, what's the basis of the information
16 contained for those lines 6 to 8 on the same page?

17 A. That's footnote 50.

18 Q. So that pertains to both sentences?

19 A. Yes.

20 Q. And --

21 A. Actually, I'm not -- I am not 100 percent
22 sure on that whether it applies to both sentences. I
23 just don't remember sitting here.

24 Q. And the "Export Growth - U.S. Exports to
25 Mexico" bullet point, particularly the sentence from

1 lines 9 to 11, is the source of that a document from
2 the Mexico National Energy Ministry?

3 A. I mean, I don't remember whether I saw a
4 secondhand description of that or firsthand.

5 Q. And can you go to page 50, Figure 10 of
6 your testimony, rebuttal testimony. And the source
7 for that is listed as SNL Financial, correct?

8 A. Yes.

9 Q. Is that from a publicly available
10 document?

11 A. It's -- it's from a data source that you
12 have to pay to get, so it's something that anyone can
13 buy, to my knowledge.

14 Q. And are the figures there for the U.S.
15 nationally?

16 A. The numbers here are for transactions off
17 of a specific platform or set of platforms, so it may
18 not be every transaction in all platforms, but it is
19 a description of what was happening in one -- one or
20 more of the platforms for trading of natural gas. I
21 believe it was for the NYMEX and CME.

22 Q. And can you turn to page 59 of your
23 rebuttal testimony, lines 10 through 11. And for the
24 statement going forward drilling is expected to
25 average approximately 2,500 wells per year, what's

1 the basis for that statement?

2 A. ICF projections.

3 Q. Any specific ICF projections?

4 A. It's an approximate number, as you can
5 see it is approximate number, I believe also from Q2
6 2015 expectations. Quarter 2, second quarter, 2015.

7 MS. FLEISHER: That's all, your Honor.

8 Thank you.

9 EXAMINER PRICE: Thank you.

10 Ms. Ghiloni? Did I pronounce your name
11 correct?

12 MS. GHILONI: You did. I have no
13 questions, your Honor. All of our questions were
14 asked. Thank you.

15 EXAMINER PRICE: Mr. Dougherty.

16 MR. DOUGHERTY: No questions, your Honor.

17 EXAMINER PRICE: Mr. Olikier?

18 MR. OLIKER: Actually, Mr. Hays does have
19 some questions.

20 EXAMINER PRICE: I know Mr. Hays has some
21 questions but -- let's go off the record.

22 (Discussion off the record.)

23 EXAMINER PRICE: Let's go back on the
24 record.

25 Mr. Hays will do cross-examination next.

1 Thank you, Mr. Hays.

2 - - -

3 CROSS-EXAMINATION

4 By Mr. Hays:

5 Q. All set, Mr. Rose?

6 A. Yes, sir.

7 Q. Tom Hays, nice to talk to you again.

8 A. Good afternoon.

9 Q. What do you mean by volatility? You
10 talked about it a number of times today, I think
11 particularly in regard to short term, the short-term
12 volatility.

13 A. Volatility refers to the frequency and
14 extent of movement in the prices, so a volatile
15 product would have a very dramatic movement in
16 prices, and a nonvolatile product would have a
17 relatively lower movement in prices.

18 Often this is measured by statistics,
19 known as -- which is the change -- percent change in
20 a daily price, and that's the statistics I present in
21 the document, would show that -- in my rebuttal
22 testimony that would show that natural gas is the
23 most volatile commodity, 2.6 times more volatile than
24 the S&P 500. So it's extremely lots of movements in
25 terms of percent change in price.

1 And the reasons for that is once you have
2 completed the well, there are very little variable
3 costs to operating it, and when there is a shortage
4 of gas, you will pay anything for it. So it
5 accentuates the volatility relative to something
6 where it would be nice to have, you don't have to
7 have it or there is a lot of variable costs to
8 produce it. So it's related to the fundamental
9 economics of the activity, and it's describing these
10 very large changes in price.

11 Q. When I looked at your forecast, would you
12 not agree it looks like a curved line?

13 A. Is this a specific reference that you
14 have?

15 Q. No. I am just saying in general,
16 generically speaking, wouldn't you agree your
17 forecast is a set price for each time, so you can
18 look down and look at the year 2017 in January and
19 you can find a point on the line; am I correct?

20 A. I'm forecasting the expected value for
21 parameters, and that's what's known as the first
22 moment of the distribution, the expected or average
23 value. There's a second moment in the distribution,
24 which is variance. I'm not forecasting the variance.
25 I am pointing out that there is a lot of variance,

1 particularly with respect to some of the parameters
2 that I am forecasting, particularly natural gas.

3 Q. Does that mean for someone reading --
4 reading your report that you are saying that at a
5 given time, the result that happens in the future may
6 very well be off the line or off the forecast?

7 A. I think the best way to think about it is
8 in a given year if you repeated that year many times,
9 you should get that number. And so if you are
10 looking at it over a long term period of time, you
11 should tend towards that number, but each individual
12 outcome you want could be plus or minus above that.

13 Q. Okay. I can't run the year 2017 many
14 times, would you agree with me?

15 MR. KUTIK: Objection.

16 EXAMINER PRICE: Grounds?

17 MR. KUTIK: I am not sure what that
18 means.

19 EXAMINER PRICE: Well, the witness can
20 answer if he understands.

21 A. It's true that there is only one 2017,
22 but there's also many years out in the future that I
23 am forecasting, and I am forecasting 20 years, and so
24 I do have the law of large numbers. But it's true
25 that an individual year only occurs once as part of

1 just a statement of the fact.

2 And with respect to Monte Carloing an
3 analysis of 2017, we already discussed that. It's
4 not difficult doing all the years, but it's still a
5 difficult task.

6 Q. I actually wasn't going to ask that, but
7 we could go to, say, the first year, 2016, and we
8 could run a Monte Carlo on that?

9 A. It would be easier. I don't think you
10 could do it. I have never seen it done.

11 Q. Could you run a Monte Carlo for the year
12 '16 with just gas prices?

13 A. We could -- you could do it, but you --
14 it would take too long to be practical.

15 Q. This may seem like a naive question, but
16 if you would turn on one of the business channels on
17 T.V. and you looked at them, would you not agree you
18 might get a talking head from a gas industry one day
19 that says prices are going to collapse further and
20 get another guy from the gas industry whose kind of a
21 large company saying he thinks they are going to firm
22 up and double in the next five years?

23 MR. KUTIK: Objection.

24 EXAMINER PRICE: Grounds?

25 MR. KUTIK: Relevance.

1 EXAMINER PRICE: I'll allow it.

2 A. Well, when I watch T.V., I usually don't
3 see people providing long-term projections, for
4 example, of natural gas prices. And all of the
5 long-term projections are pretty much in agreement in
6 this case with respect to the long-term gas price.

7 You do see discussion of shorter-term
8 phenomenon in those shows, but you almost never see
9 long-term projections.

10 Q. And by shorter term, would you mean three
11 years?

12 A. It depends on the circumstance. You
13 know, my experience in those T.V. shows, they are
14 usually talking about very short periods of time. I
15 think three years would be a little long for that
16 group.

17 Q. Okay. But in the short term, if -- let's
18 just agree short term means three years, for the sake
19 of this conversation.

20 MR. KUTIK: Is there a question to the
21 witness?

22 Q. If that's okay by you, Mr. Rose.

23 A. You are asking me to assume that, and I
24 will assume that.

25 Q. Okay. Thank you. If I am understanding

1 your testimony, the -- there will be greater
2 volatility in the first three years than there will
3 be in the years four and out; is that correct?

4 A. The average of the years four through out
5 will be less volatile than the individual years or
6 shorter term periods, so your volatility will tend
7 toward higher numbers as your period shortens, and
8 the opposite is true. This finding is referred to as
9 the law of large numbers, and it's a very important
10 statistical finding related to volatility because you
11 have an averaging effect, and it mutes the
12 variability.

13 Q. For your -- for the short term could you
14 have done a risk assessment?

15 A. I am not sure what you mean by "risk
16 assessment."

17 Q. Have you -- have you ever heard the term
18 "risk assessment" in terms of commodity pricing?

19 A. Is there some way you could be more
20 specific?

21 MR. HAYS: Your Honor, I have something I
22 didn't intend to introduce, but perhaps I could show
23 it to him.

24 EXAMINER PRICE: If you would like to
25 show it to him to see if it refreshes his

1 recollection, that's fine with me.

2 MR. HAYS: Well, permission to approach,
3 your Honor.

4 EXAMINER PRICE: You may approach.

5 MR. KUTIK: May I see as well, your
6 Honor?

7 EXAMINER PRICE: You may.

8 MR. KUTIK: May I stand by the witness
9 while he is inquired about the document?

10 EXAMINER PRICE: You may.

11 MR. HAYS: Your Honor, since it is a
12 rarity for me, should I just describe it for the
13 record or do I need to do that at this point?

14 EXAMINER PRICE: No. If you were simply
15 refreshing his recollection on the term "risk
16 assessment."

17 MR. HAYS: Thank you, your Honor.

18 EXAMINER PRICE: You can ask your next
19 question.

20 Q. (By Mr. Hays) I think we were discussing
21 the term "risk assessment." Are you familiar with
22 whether or not risk assessments are conducted for --
23 for natural gas forecasts or for commodity pricing
24 purposes?

25 A. When I looked at the documents you gave

1 me, what they are doing in that analysis is looking
2 at a single parameter, Henry Hub.

3 And we have to carry gas prices for the
4 whole country. They are looking at a single
5 parameter, and they are doing something that is
6 related to Black-Scholes' analysis, which has been a
7 set of analyses related to options prices, implied
8 volatility, and it's making certain assumptions about
9 not only the percent change in daily price, and what
10 it's assuming is that percent change in daily price
11 will be the same as it has been in the past as going
12 forward or as implied by options.

13 And that analysis is generally not done
14 for long-term periods of time. It's done for
15 short-term periods of time. And it's generally used
16 for very specific circumstances when you have one
17 item that you are analyzing.

18 Q. Okay. Would you agree with me that the
19 EIA does risk assessments for Henry Hub spot prices?

20 A. They do in that document that you gave
21 me. They do make a calculation for short-term
22 prices, and they do create a confidence default which
23 is related to certain assumptions about the
24 uncertainty that they are deriving from traded
25 options.

1 Q. So, for example, they will give a spot
2 price of \$2 or \$3 or \$4 on one axis for the futures
3 price over the next year and then a percentage line
4 that says, hey, here is the percent chance that this
5 will be exceeded or met for each of those prices. So
6 it's a line that shows both the probability and the
7 costs; am I correct?

8 A. Yes. And the critical issue there is
9 that the estimate of the underlying volatility is
10 coming from traded options whose trading is generally
11 for a relatively short period of time. So the same
12 problem that affects the futures prices, which is --
13 is that the volume of transactions, the liquidity is
14 extremely low also affects the trading of options
15 and, I believe, the usefulness of that analysis is
16 limited to a short-term analysis.

17 Q. Right. And we've agreed to speak about
18 short term meaning three years. In this case the EIA
19 analysis was one year; am I correct?

20 A. Yes. And, for example, they assume that
21 the uncertainty increases with the square root of T,
22 so for their analysis they do not take into account
23 the law of large numbers or the averaging or any
24 regressions to the mean, and so that's a -- the
25 reason why it's limited to very short-term periods of

1 time.

2 Q. So they are looking, though, at a range
3 of possible outcomes for natural gas future prices
4 for the year 2016, correct?

5 A. In that particular example they are
6 focusing on Henry Hub, which is relatively liquidly
7 traded.

8 Q. But for one-year period I described.

9 A. In the document you handed me, that's my
10 recollection.

11 Q. Okay. Are you familiar with the
12 International Monetary Fund?

13 A. I know of the IMF. I am not a
14 macroeconomist or central banker or international
15 economist. I am really an energy economist that
16 focuses in on America, but I have some limited
17 knowledge of the IMF.

18 Q. Are you aware that the International
19 Monetary Fund does commodity price outlooks and risks
20 on a monthly basis?

21 A. I'm not familiar with that.

22 Q. When you look at your model, it was the
23 ICM model?

24 A. It's the -- we used the IPM model.

25 Q. IPM, sorry.

1 A. But we also used the GE MAPS model so we
2 could get each individual node, and there were other
3 tools we used as well, so it was -- but IPM was one
4 of them.

5 And, I'm sorry, the multiplicity of tools
6 makes this very complicated because you have to have
7 the models coordinated, and so it's -- the nice thing
8 about the Black-Scholes' model, which is, it doesn't
9 appertain for long periods of time but it's easy to
10 calculate. There was a closed-form solution that was
11 developed, and some people got a Nobel Prize for
12 that, but even though it's easy to use, it's just not
13 helpful for the long term.

14 Q. Okay. Does the power purchase agreement
15 cover the short term the next three years?

16 A. It depends on the power purchase
17 agreement.

18 Q. The power purchase agreement in this
19 case.

20 A. My understanding, it starts in the middle
21 of next year and would cover parts of the next three
22 years, yes.

23 Q. It would cover all of the next three
24 years, wouldn't it?

25 MR. KUTIK: We'll stipulate to that, your

1 Honor.

2 A. I don't want to quibble.

3 EXAMINER PRICE: You don't have to
4 answer.

5 A. I don't exactly know all the details of
6 the PPA.

7 MR. KUTIK: Mr. Rose, I stipulated.

8 THE WITNESS: Okay. I have been so
9 advised.

10 Q. (By Mr. Hays) Does ICF maintain a
11 website?

12 A. Yes.

13 Q. On that website does it announce it has a
14 quarterly ICF forecast energy outlook?

15 A. It has at times in the past. I don't
16 know if it's doing it right now.

17 Q. Are you involved with it at all?

18 MR. KUTIK: Objection. What is "it"?

19 MR. HAYS: With the ICF forecast energy
20 outlook.

21 MR. KUTIK: I'll object. This has been
22 asked and answered in his last cross-examination.

23 EXAMINER PRICE: Excuse me, Mr. Rose. We
24 have a pending objection.

25 Who asked it?

1 MR. ALEXANDER: Some of these have been
2 admitted.

3 EXAMINER PRICE: Pardon me?

4 MR. ALEXANDER: Some of these have been
5 admitted.

6 EXAMINER PRICE: I understand that. But
7 the question is, is he involved with it. That's the
8 pending question, is he involved in the quarterly
9 energy forecasts?

10 MR. KUTIK: My understanding -- my
11 understanding, your Honor, in the foundation that was
12 laid for those documents, those questions were asked.

13 EXAMINER PRICE: Okay.

14 MR. HAYS: I will withdraw the question,
15 your Honor. Because we didn't get a copy of all the
16 exhibits, it's not worth the court's -- excuse me,
17 the Bench's time, having spoken with Mr. Fisk.

18 I am going -- your Honor, with your
19 permission, I would like to approach with one that I
20 am going to mark as NOAC Exhibit 1.

21 EXAMINER PRICE: You may approach, and it
22 will be so marked.

23 (EXHIBIT MARKED FOR IDENTIFICATION.)

24 MR. HAYS: Your Honor, NOAC marked as
25 Exhibit 1 is a -- I think a nine -- eight- or

1 nine-page document that begins "Commodity Price
2 Outlook & Risks" with the symbol of the International
3 Monetary Fund on it.

4 And the last page is something I
5 appended, which is how to get there on the http
6 address.

7 Q. (By Mr. Hays) Mr. Rose, I believe you
8 indicated you are familiar with the International
9 Monetary Fund, but perhaps not so much with their
10 forecasting.

11 A. That's correct.

12 Q. I'm mainly interested in not asking you
13 what the document says, but to ask if you could look
14 at what they've done here under "Risks" where it
15 says -- and drawing your attention specifically on
16 the first page to the second paragraph that says
17 "Risks."

18 MR. KUTIK: Well, your Honor, at this
19 point I'll object. Lack of foundation.

20 EXAMINER PRICE: Mr. Hays, would you care
21 to lay a better foundation for the use of this
22 document, please?

23 MR. HAYS: Well, I believe, your Honor,
24 the International Monetary Fund is well known to
25 everybody in the room as one of the largest

1 organizations dealing with international finances.

2 MR. KUTIK: That may well be, but if this
3 witness is not familiar with the document, no
4 foundation has been laid, your Honor.

5 EXAMINER PRICE: You need to show he is
6 familiar with the document or at least this document,
7 relied upon other documents like this in the past or
8 otherwise recognizes this document.

9 MR. HAYS: I guess in order to do that,
10 your Honor, because I believe he probably has relied
11 on documents similar to this in the past that have
12 risk assessments in them, if we could give the
13 witness a moment to read the section on risks and
14 then to look at the natural gas chart on page 2, 4,
15 and 6.

16 EXAMINER PRICE: You can have him look at
17 it, but you are still going to have to lay a
18 foundation to use this document.

19 MR. HAYS: I understand that, your Honor.

20 A. Okay.

21 Q. Mr. Rose, in the past have you worked
22 with or relied upon documents that are similar to
23 this approach of discussing risk for the short term,
24 natural gas prices?

25 MR. KUTIK: Again, your Honor, I'll

1 object.

2 EXAMINER PRICE: Grounds?

3 MR. KUTIK: Well, foundation. Not only
4 with respect to this document, but with respect to
5 whatever technique is purported to be shown in this
6 document.

7 EXAMINER PRICE: Sustained. I think
8 you -- first of all, you haven't even asked him the
9 threshold question, has he seen this document; and,
10 second, even if he hasn't seen this one, perhaps you
11 can inquire whether he has seen other documents from
12 IMF. I don't think that you can lay a foundation by
13 saying has he seen other natural gas documents
14 because I think it's well established that he has.

15 Q. (By Mr. Hays) Have you seen this document
16 before, Mr. Rose?

17 A. No, sir.

18 Q. Have you seen other documents like this?

19 MR. KUTIK: Well, I guess I'll object to
20 that one too, your Honor. What does "like this"
21 mean?

22 EXAMINER PRICE: Let's give counsel just
23 a little bit of leeway here on that. Have you seen
24 other documents from the IMF related to commodity
25 pricing?

1 THE WITNESS: No.

2 Is there a question?

3 EXAMINER PRICE: No, there is no question
4 pending right now. I just asked one.

5 Q. (By Mr. Hays) Mr. Rose, in your
6 consulting work, do you ever provide natural gas
7 prices for the short term with confidence intervals?

8 A. Yes.

9 Q. Do you do those in transactions -- have
10 you done those in transactions where a commercial
11 deal is involved?

12 MR. KUTIK: Well, I will object only to
13 the extent that it would require the witness to
14 reveal confidential information. If he can answer
15 that question without doing so, your Honor, I would
16 ask that he be so instructed.

17 EXAMINER PRICE: Only answer the question
18 to the extent you can do so without revealing
19 confidential information. If you can answer but you
20 will reveal confidential information, we will take it
21 up on the confidential transcript.

22 MR. KUTIK: Well, I guess the question,
23 is, your Honor, I wouldn't mind if it was proprietary
24 questions to the companies to discuss in
25 confidential, but if it's confidential with respect

1 to ICF, it's a different story.

2 EXAMINER PRICE: I understand that. I
3 understand that.

4 A. The work that we have done has involved
5 commercial entities, but I don't know -- I can't
6 remember what it was being used for.

7 Q. Mr. Rose, are you a geologist at all?

8 A. No.

9 Q. Or a petrochemical engineer?

10 A. No.

11 Q. Have you ever worked on the technology
12 for drilling horizontal wells?

13 MR. KUTIK: Objection.

14 EXAMINER PRICE: Grounds?

15 MR. KUTIK: Relevance.

16 EXAMINER PRICE: Mr. Hays, relevance?

17 MR. HAYS: I'm sorry, I missed what the
18 objection is.

19 MR. KUTIK: Relevance, Mr. Hays.

20 MR. HAYS: Oh, several times today he's
21 testified about -- what the advances will be in
22 shale -- in the shale plays and made other comments
23 about what he believes will happen in terms of
24 production increases or what the limits are.

25 EXAMINER PRICE: I'll allow this one.

1 THE WITNESS: Could I have the question
2 reread, please.

3 (Record read.)

4 A. I'm not sure what that means. Are you
5 asking have I ever drilled a horizontal well?

6 Q. I will ask that first. Have you ever
7 drilled a horizontal well?

8 A. No.

9 Q. Have you ever been involved with the
10 analysis of where such a well should go?

11 MR. KUTIK: Objection.

12 EXAMINER PRICE: Sustained.

13 Q. Do you think that rig counts should be
14 used as a predictor of natural gas production?

15 A. Under certain circumstances they can
16 provide information about production levels, but it
17 is only one of the many factors, and it depends on
18 what time period you are looking at and what type of
19 question you are trying to answer.

20 Q. Would you agree with me you used a chart
21 that went back to 2010 to show rig count?

22 A. Yes, sir.

23 Q. Do you think that the rigs in 2010 are
24 comparable to the rigs in 2015?

25 A. I'm not sure what you are asking me, but

1 what do you mean by comparable?

2 Q. Comparable in the output per rig.

3 A. No.

4 Q. Would you agree with me that since 2013
5 the EIA has taken the position that you -- that rig
6 count has to be reconsidered and not used as it was
7 back in 2010, '11, '12?

8 A. If you have a specific reference, I'm not
9 sure. Do you have a specific reference you want me
10 to look at?

11 Q. No. I am asking you if you are aware of
12 that.

13 MR. KUTIK: Well, I'll object. It
14 assumes facts.

15 EXAMINER PRICE: He's only asking if he
16 was aware. I'll allow it.

17 A. If you are referring to a specific
18 document, I just am not sure which one you are
19 referring to.

20 Q. I was referring to the general idea that
21 the EIA has stated that using rig count, particularly
22 the years like 2010, '11, '12, is really not proper?

23 EXAMINER PRICE: Well, now I am going to
24 subject myself about assuming facts not in evidence.

25 Mr. Rose, are you aware of any recent

1 commentary by the EIA on the use of rig counts?

2 THE WITNESS: The issue about rig counts
3 is an issue that's generally in discussion, and it's
4 in discussion in my testimony. I talk about the --
5 on page 59 what a rig does over time and that changes
6 over time. The basic technology is the same, and
7 where the change has been the most significant is in
8 the amount of gas that each well is producing over
9 the lifetime of the well.

10 And I mentioned earlier that it's
11 increased over the last five years from four to five,
12 so it's growing at a moderate rate, whatever the rate
13 four or five that I am describing. That's something
14 that's happening.

15 So a rig five years ago was less
16 productive than a rig today, so I think that's well
17 known and discussed, and the data is coming from the
18 government and other sources on that. And I discuss
19 on page 59 what I think is going to be the
20 productivity of the rates around the rigs over time,
21 and that's built into our forecast.

22 EXAMINER PRICE: Mr. Hays.

23 MR. HAYS: Could I have the Bench's last
24 question read back?

25 EXAMINER PRICE: You may.

1 (Record read.)

2 MR. KUTIK: Does counsel have another
3 question, your Honor?

4 MR. HAYS: Yes. I don't believe that
5 question was answered, so I would ask that same
6 question.

7 MR. KUTIK: Well, he answered that
8 question.

9 EXAMINER PRICE: He answered the question
10 as I intended. He was fully responsive to what I was
11 asking, so you can ask a different question.

12 Q. (By Mr. Hays) You indicated that you do
13 market -- excuse me. I believe in your testimony you
14 indicated that your -- you have done or your firm has
15 done market intelligence.

16 A. I don't think I used that term. I think
17 we do things in that category as a firm. Again, if
18 this is a specific reference, I would be glad to take
19 a look at it.

20 Q. Do you go to the Barclay's -- Barclay's
21 CEO Energy Power Conference?

22 A. No. I don't think I have ever been to
23 that.

24 Q. Do you know if your firm makes
25 presentations there?

1 A. No, I don't know.

2 Q. Do you know who Chesapeake Energy is?

3 A. Yes, I do.

4 Q. And who are they?

5 A. It's a producer of natural gas and oil.

6 Its headquarters is in Oklahoma City, I believe.

7 Q. Do you know if it is the largest driller
8 in the Utica shale formation in Ohio?

9 A. I know it's a big company, but I don't
10 know sitting here.

11 Q. Do you know what they are predicting for
12 the output per well through the new methods they are
13 installing?

14 MR. KUTIK: Objection.

15 EXAMINER PRICE: Grounds?

16 MR. KUTIK: If he does, it's hearsay.

17 EXAMINER PRICE: Why don't you ask about
18 his personal knowledge.

19 Q. Do you know -- do you know what the --
20 what the projections are for the productivity per
21 well in the Utica shale formation in the next -- in
22 the coming years?

23 A. I know the projection of ICF for the
24 Marcellus generally. But when you say "projection,"
25 are you referring to my projection or someone else's

1 projection?

2 Q. At this time I am asking about your --
3 your projection, and I am asking about the Utica
4 shale.

5 A. No. I have those numbers handy for
6 Marcellus, but not for Utica.

7 MR. OLIKER: Can I have the question read
8 back.

9 EXAMINER PRICE: You may.

10 (Record read.)

11 Q. Can you describe for me the difference
12 between the Utica shale gas and Marcellus shale gas?

13 A. One difference is the Marcellus is much
14 bigger in terms of current production, 15 bcfd, or
15 being cubic feet per day, versus 2 for the Utica.

16 Second, is that they are geographically
17 in similar areas. They are both based on
18 outcroppings in New York. Utica and Marcellus are
19 places in New York. I believe that there are
20 different depths and there's different other geologic
21 characteristics, like porosity, et cetera. There's a
22 lot more drilling in the Marcellus than there is in
23 Utica.

24 Q. In Ohio is there more drilling in the
25 Utica or in the Marcellus?

1 A. I believe it's more in the Utica, but I
2 don't have all the numbers state by state with me.
3 My firm has them, but I don't have them sitting here.

4 Q. Would it surprise you if in the last
5 monthly report of ODNR they showed no drilling rigs
6 in the Marcellus in Ohio but 24 rigs in the Utica?

7 A. It's consistent with what I said before,
8 and so I will answer the answer no, I am not
9 surprised. But I think -- I feel it's a very
10 subjective term, "surprised."

11 EXAMINER PRICE: That was a surprising
12 answer.

13 Q. The -- I believe you gave the number for
14 the Utica shale as 2 billion cubic feet a day; am I
15 correct?

16 A. Yes. I mean, I used the term 2 billion
17 cubic feet per day. I think it's equivalent.

18 Q. All right.

19 A. That's a number -- number.

20 Q. And that's -- that's actually the number
21 from 2014; am I correct?

22 A. I believe so.

23 Q. Would you not agree that the current
24 number in 2015 is 3 billion cubic feet?

25 A. If you have a source, I will be glad to

1 take a look at it. I don't have that memorized.

2 MR. HAYS: May I approach, your Honor?

3 EXAMINER PRICE: You may. Are you giving
4 this to the witness to refresh his recollection?

5 MR. HAYS: Yes, your Honor.

6 A. Okay.

7 Q. Mr. Rose, did this refresh your
8 recollection as to the volume for 2015?

9 A. I've seen the numbers before, and I don't
10 feel like I'm refreshed, so I'm not sure what to say.
11 It's similar to the number I had before. It is
12 higher, and I see the numbers you showed me. I have
13 nothing to argue with that.

14 Our forecast shows a massive increase.
15 It's here in the document several times, a double of
16 some of the Marcellus and Utica over time, so we have
17 a big increase. But in terms of what's going on
18 exactly today in 2015, I looked at the document. It
19 looks -- it looks reasonable. I don't know if I feel
20 refreshed, though.

21 Q. And that's the EIA document I showed you?

22 MR. KUTIK: Objection.

23 EXAMINER PRICE: Grounds?

24 MR. KUTIK: Well, I think we need a
25 little better foundation than referring backwardly to

1 the EIA document.

2 EXAMINER PRICE: I mean, you only offered
3 it to him to refresh his election.

4 But, Mr. Rose, the answer to his question
5 did that refresh your recollection is no, isn't it?
6 You don't have any -- that is not -- looking at that
7 document has not caused you to understand the 3
8 billion number that you recall; is that correct?

9 THE WITNESS: That's correct. I don't
10 disagree with it, but it doesn't refresh my memory.

11 Q. (By Mr. Hays) Do you know the "term
12 shut-in production"?

13 A. I have heard that term, yes.

14 Q. What does it mean to you?

15 A. Generally refers to production that is --
16 that could be forthcoming but is not allowed to
17 escape the well.

18 Q. And you don't really mean escape. You
19 mean it's not put in the production lines.

20 A. Right. The throttle isn't opened up.
21 It's closed.

22 Q. Correct. So is this shut-in -- do you
23 know the volume of shut-in production in Ohio?

24 A. No. I track it, somewhat different
25 statistics, drilled and uncompleted wells. I don't

1 have a shut-in number.

2 Q. Would that also go for the Marcellus
3 shale?

4 A. For the Marcellus there is about --
5 earlier this year was about a thousand drilled but
6 uncompleted wells, but I think that's only a sub --
7 it could be wells that are completed that are also
8 not being allowed to produce, so it's only a partial
9 measure of available inventory.

10 MR. HAYS: Mr. Rose, thank you very much.
11 I appreciate your time.

12 No further questions, your Honor.

13 EXAMINER PRICE: Thank you, Mr. Hays.

14 Mr. Oliker?

15 MR. OLIKER: Thank you, your Honor.

16 - - -

17 CROSS-EXAMINATION

18 By Mr. Oliker:

19 Q. Good afternoon, Mr. Rose.

20 A. Good afternoon.

21 Q. Before I forget, I want to touch on a
22 subject there has been a lot of discussion of, rigs
23 producing natural gas. Would you agree that rigs
24 don't produce any natural gas? It's wells that
25 produce the gas?

1 A. When I think about gas -- I mean, when I
2 think about gas production, I think about the
3 production process, which involves initial geologic
4 assessments, involves drilling, involves completion,
5 it involves the treating of the gas, gathering, the
6 pipeline process.

7 So I think, in general, it covers a broad
8 set of activities, including the rotary drill rigs.
9 It's also the case that the gas is ultimately coming
10 out of the well.

11 Q. Okay. Just so the record is clear, you
12 agree that the rig drills the hole in the ground.
13 The well is what produces the gas, correct?

14 A. The well produces the gas, yes.

15 Q. Okay. We'll come back to that later.
16 But in your testimony you had a little bit of
17 discussion with counsel that it doesn't make sense to
18 run multiple scenarios, such as a Monte Carlo model;
19 is that correct?

20 A. Is there a specific discussion you are
21 referring to?

22 Q. I am just trying to paraphrase to move
23 this along. I think it's around pages 10 to 12 in
24 your testimony, you indicated that time constraints
25 would make it impossible to run several Monte Carlo

1 runs.

2 A. Are you referring to pages 9 and 10?

3 Q. I believe that discussed it as well.

4 A. The other pages don't relate to Monte
5 Carlo.

6 Q. Okay. So just to be clear, you indicate
7 the reason you didn't run Monte Carlo multiple times
8 is because it would take a long time and this is on
9 page 10, right?

10 A. Yes. In the particular application that
11 I am referring to where you use MAPS and IPM and do
12 the modeling that we did, yes.

13 Q. But you do believe there is great value
14 to analyzing and averaging multiple forecasts,
15 correct?

16 A. That's too general of a statement. I
17 need more specifics to even respond to that.

18 Q. Okay. Would you agree that averaging
19 forecasts has the following advantages: Different
20 forecasts drawing on varying information and
21 emphasizing different issues?

22 A. Yeah. If you have a specific reference,
23 I will look at it.

24 MR. OLIKER: I think I can speed this
25 along. May I approach, your Honor, and mark a

1 document?

2 EXAMINER PRICE: You may.

3 MR. OLIKER: Unfortunately, my copies
4 aren't stapled, but it's only two pages.

5 EXAMINER PRICE: We will make do without
6 staples. What number is this, Mr. Oliker?

7 MR. OLIKER: I believe this is IGS
8 Exhibit 14.

9 EXAMINER PRICE: It will be so marked.

10 (EXHIBIT MARKED FOR IDENTIFICATION.)

11 Q. Mr. Rose, do you see the exhibit that has
12 been marked as IGS Exhibit 14?

13 A. I do.

14 Q. Is this testimony you filed in Canada in
15 2011 or a portion of it?

16 A. It's an excerpt. It is related to a
17 specific context of testimony I gave in 2011.

18 Q. And that was before the Public Utilities
19 Board of Manitoba Hydro; is that correct?

20 A. It's the public utility -- it's the
21 Public Utilities Board of Manitoba.

22 Q. Okay.

23 A. Not Manitoba Hydro. And I did give
24 testimony in that case. But in that case I wasn't
25 dealing with forecasts that had major methodological

1 errors.

2 MR. OLIKER: Your Honor, I would move to
3 strike everything after his answer that said it was
4 the Public Utilities Board of Manitoba.

5 EXAMINER PRICE: Granted.

6 MR. OLIKER: Thank you.

7 Q. And that testimony was on February 22,
8 2011, when it was filed; is that correct?

9 A. The direct testimony was given on
10 February 22, 2011.

11 Q. Okay. And in that testimony you
12 testified that "Averaging forecasts has the following
13 advantages: Different forecasts drawing on varying
14 information and emphasize different issues -
15 averaging captures these diverse views and evens out
16 extreme positions. They may use different methods of
17 forecasting - averaging likely to offset errors." Is
18 that correct?

19 A. Yes. And as I indicated, it was in the
20 context of having several different forecasts, all of
21 which were methodologically reasonable.

22 MR. OLIKER: Your Honor, I would move to
23 strike everything after "yes."

24 MR. KUTIK: Your Honor, he has provided
25 an excerpt of the document. He should be able to put

1 that comment in context.

2 EXAMINER PRICE: I understand, Mr. Kutik,
3 and you will have that opportunity on redirect.

4 Sustained -- or granted.

5 MR. OLIKER: Thank you, your Honor.

6 Q. And you also indicate in this testimony
7 that -- first would you agree that the MH acronym
8 stands for Manitoba Hydro?

9 A. Yes.

10 Q. You indicate that "MH's approach to use
11 consensus forecasts plus a premium as a minimum for
12 pricing long-term contracts is reasonable." Is that
13 correct?

14 A. That's what it says.

15 EXAMINER PRICE: Well, no. Was that your
16 testimony in Manitoba?

17 THE WITNESS: It's an excerpt of my
18 testimony, yes.

19 Q. (By Mr. Oliker) Okay. And in Manitoba
20 you also cite on the following page to Professor
21 Armstrong, where you quote, "Professor Armstrong has
22 found that [the] techniques of [averaging forecasts]
23 reduces forecasting error up to 58 percent - a
24 massive improvement over individual forecasts.'"
25

Was that your testimony in Manitoba?

1 A. It was an excerpt of my testimony, yes.

2 Q. Okay. And understanding this is just an
3 excerpt of your testimony, the provisions that have
4 been provided to you look to be clear and accurate
5 copies of the testimony you submitted there; is that
6 correct?

7 MR. KUTIK: I object, because it is
8 clearly an excerpt, your Honor.

9 MR. OLIKER: That's why I asked about the
10 excerpt, your Honor.

11 EXAMINER PRICE: I don't understand your
12 question.

13 MR. OLIKER: Trying to ensure he is
14 identifying this is an accurate copy of the excerpt.
15 It's that simple.

16 EXAMINER PRICE: Do you have the whole
17 document?

18 MR. OLIKER: I don't have the whole
19 document with me, but I can provide it as a
20 late-filed exhibit if they would like it. I was only
21 asking about this -- whether this portion appears to
22 be accurate, your Honor. That's my question.

23 EXAMINER PRICE: I don't think that's a
24 fair question unless he has got a copy of the full
25 document to compare it to.

1 MR. OLIKER: I can look it up on line. I
2 have that.

3 EXAMINER PRICE: No. We are not going to
4 look things up on line. That will just extend this
5 hearing out unnecessarily.

6 MR. OLIKER: Okay. And by that I meant I
7 have a link to it on my computer ready.

8 EXAMINER PRICE: I may be stuck in an
9 older era of laptops not at hearings, but, no, I
10 don't think we need to be producing documents in the
11 middle of the hearing.

12 MR. OLIKER: Okay.

13 EXAMINER PRICE: Let's ask your next
14 question related to this testimony.

15 MR. OLIKER: Okay. That was actually my
16 last question about the testimony, your Honor.

17 Q. (By Mr. Oliker) Okay. Moving back to
18 your rebuttal testimony in this proceeding -- first,
19 this is just paraphrasing for sake of time. You
20 indicate that FERC approved the first delay in the
21 PJM capacity auction, a delay which indicates
22 something important is happening because otherwise no
23 one would agree to decrease the time available to add
24 new power plants to meet load. Would you agree that
25 PJM stated that the purpose for the delay was

1 actually to avoid holding additional transition
2 auctions?

3 A. First of all, I don't agree with the
4 paraphrasing, and my point here in the testimony is
5 PJM told them don't delay unless you are serious when
6 approving something similar. And they did delay, and
7 they did approve something similar.

8 MR. OLIKER: Your Honor, I would move to
9 strike his answer which did not respond to my
10 question.

11 EXAMINER PRICE: Let's have the question
12 back, please.

13 (Record read.)

14 EXAMINER PRICE: I think it was perfectly
15 responsive to your question. You asked if he would
16 agree to what PJM said, and he said "no" and
17 explained.

18 MR. OLIKER: I would move to strike after
19 the word "no," which I don't think was in there.

20 EXAMINER PRICE: Well, I paraphrased his
21 "no," but, no, we are not striking any part of his
22 testimony at this point.

23 MR. OLIKER: Okay.

24 Q. (By Mr. Olikier) Mr. Rose, isn't it true
25 that many parties oppose the transition auctions in

1 the capacity performance proposal, if you know?

2 A. I don't know what "many" means. There
3 were some opponents. I'm not sure what you mean by
4 "many."

5 Q. Did the Retail Energy Supply Association
6 raise legal and policy issues against the transition
7 auctions?

8 A. There was opposition and comments from
9 retail proponents. If you have a specific citation,
10 I would be glad to take a look at it.

11 Q. Did you review the protest filed by the
12 Retail Energy Supply Association?

13 EXAMINER PRICE: Mr. Olikier, you are no
14 longer talking about the postponed base residual
15 auction? You are talking about the transition
16 auctions and capacity performance now?

17 MR. OLIKER: I am referring to them as
18 one and the same. The discussion of the order
19 itself, the protest filed on the proposal.

20 EXAMINER PRICE: Okay. Thank you.

21 A. I have read things retail proponents
22 related to the opposition to the capacity performance
23 program generally, but, again, I need more
24 specificity to answer that question.

25 Q. Okay. Would you agree that if FERC had

1 not delayed the auctions and it had held the BRA on
2 schedule in May and the order came out in June, then
3 potentially it would have had to hold an additional
4 transition auction for the '18-'19 delivery year?

5 A. That could be a decision they made. It's
6 not necessarily the decision they would have made,
7 but it's a possibility.

8 Q. Okay. Earlier you had discussion with
9 counsel for Sierra Club about the peak-load
10 assumptions used in the capacity auction. Do you
11 remember that discussion?

12 A. Yes.

13 Q. Would you agree that peak load is the
14 quantity that is used to determine the target reserve
15 margin?

16 A. Net peak load is one of the quantities
17 that is used to determine the reserve margin.

18 Q. Okay. And isn't it true that certain
19 individuals on the PJM staff have indicated that if
20 the capacity performance product is successful, PJM
21 may be able to decrease the target reserve margin
22 used in the capacity auction?

23 MR. KUTIK: Objection.

24 EXAMINER PRICE: Grounds?

25 MR. KUTIK: Relevance.

1 EXAMINER PRICE: Mr. Oliker?

2 MR. OLIKER: He's forecasting capacity
3 prices, and he earlier indicated the target reserve
4 and the peak load, all else being equal, if you were
5 to reduce it, the price will come down.

6 MR. KUTIK: But the question is what's
7 the relevance of what someone on PJM's staff says?

8 MR. OLIKER: They are the ones that file
9 the proposals regarding the capacity markets.

10 EXAMINER PRICE: I am struggling with the
11 transition from what PJM says to what members of the
12 staff may have said.

13 MR. OLIKER: Okay. I will rephrase the
14 question then, your Honor.

15 EXAMINER PRICE: That would be great.

16 Q. (By Mr. Oliker) Okay. Mr. Rose, would
17 you agree that PJM has indicated that if the capacity
18 performance product is successful, it could
19 potentially reduce the target reserve margin?

20 A. Do you have a specific reference?

21 EXAMINER PRICE: Actually, Mr. Rose, I
22 think you can either agree or not agree without a
23 specific reference to this. He's just asking you a
24 general principle.

25 A. I don't have a specific statement that I

1 am aware of in that regard.

2 Q. Could you turn to your deposition,
3 please, at page 80. Let me know when you are there,
4 please.

5 A. I'm there.

6 Q. And page 80, line 5, let me know if I
7 read this correctly:

8 Question: "Okay. And isn't it true that
9 PJM has indicated that if the capacity performance
10 product is successful, it may be able to reduce its
11 reserve margin target?"

12 Answer: "Do you have a specific
13 reference?"

14 Question: "I'm asking if you know,
15 Mr. Rose."

16 "MR. KUTIK: I object."

17 "THE WITNESS: What I would say, there
18 are some staff that have talked about that, but I
19 would have to review that more to have a full answer
20 on that."

21 Did I read that correct?

22 MR. KUTIK: Objection, your Honor.

23 EXAMINER PRICE: Grounds?

24 MR. KUTIK: Improper impeachment, not at
25 all inconsistent.

1 EXAMINER PRICE: Sustained.

2 Mr. Oliker, you may proceed.

3 Q. (By Mr. Oliker) You state on page 15,
4 line 11, "In 2014, electrical energy revenues
5 accounted for 80.9% to 86% of total powerplant
6 revenues."

7 Isn't it true that the percentage of
8 revenue is so high in 2014 because for five months of
9 the year the price for capacity was \$25 per
10 megawatt-day?

11 EXAMINER PRICE: Can I have that
12 reference again, Mr. Oliker?

13 MR. OLIKER: Page 15, line 11 and 12.

14 EXAMINER PRICE: Thank you.

15 A. I don't remember what the capacity prices
16 were. And it is related to what -- the amount of
17 electrical energy is related to the amount of its
18 capacity, as shown in the footnote. So I do know its
19 capacity was 13.7 of the numbers that we're looking
20 at, but I don't have the specific price.

21 Q. Okay. Moving to page 29 of your
22 testimony, on line 14, you indicate, "My forecast is
23 higher than 2014 levels because of massive increases
24 in demand for natural gas." And then continuing over
25 to the next sentence, you indicate, "Were it not for

1 these unprecedented increases in demand and
2 regulatory changes, my forecast prices would be much
3 lower."

4 Now, am I correct that demand increases
5 you reference in this sentence are contained in
6 Figure 7 on page 37?

7 A. That's a snapshot of a particular demand
8 increase that is in my forecast.

9 Q. And to be clear, the 24 bcf a day, that
10 is the increase you are referencing, correct? It's
11 not a higher number, right?

12 A. It's an increase for a -- to a specific
13 level in a specific year. I believe the year is 2023
14 or 2024, and that's what it's for. I don't have the
15 increase -- I know that the demand is increasing over
16 time beyond that as well.

17 Q. Okay. And as a subset of that demand,
18 first so -- before we can step back, it's 2025 is the
19 number you are referring to, correct?

20 A. No. I believe it's 2023 or 2024.

21 Q. So am I to assume the next decade you are
22 referring to starts in 2013?

23 A. It was actually measured, as I believe, a
24 nine-year increase, and it was from a historical
25 year.

1 Q. And LNG that accounts for half of the
2 increase, correct, LNG exports?

3 A. Yes, in Figure 7.

4 Q. And the amount of LNG exports that exists
5 today is zero or very close to it, correct?

6 A. Yes, but there is 9 bcfd of LNG export
7 capability under construction and 24 bcf -- 21 bcfd
8 of contracts already signed.

9 MR. OLIKER: Your Honor, I move to strike
10 everything after the word "yes." I said, "What is it
11 today?"

12 MR. KUTIK: Your Honor, I believe in
13 terms of this witness's analysis, not only in terms
14 of the stuff actually being exported but also under
15 contract is what's an important picture for today.

16 MR. OLIKER: And I asked him what's being
17 exported today.

18 MR. KUTIK: And, again, in terms of
19 export, the witness looks at both of those as his
20 answer indicates.

21 EXAMINER PRICE: We are going to allow
22 the testimony. I think the Commission --

23 MR. OLIKER: I think it would be proper
24 for redirect, perhaps.

25 EXAMINER PRICE: It would have been

1 proper for redirect, and this will save time,
2 actually. But I just think the Commission is going
3 to interpret what exports are physical and
4 contractual demand.

5 Q. (By Mr. Oliker) Would you agree -- well,
6 first you talk about the annual energy outlook
7 provided by the EIA in 2014, correct?

8 MR. KUTIK: May I have the question read,
9 please.

10 EXAMINER PRICE: You may.

11 (Record read.)

12 A. Yes, I do reference it. Is there a
13 specific reference?

14 Q. Well, would you agree that the EIA's 2014
15 outlook provides a lower forecast of LNG exports than
16 you do in the reference case?

17 A. A little bit lower, not significantly
18 lower, is what I would say.

19 MR. OLIKER: Your Honor, I would like to
20 mark an exhibit, please.

21 EXAMINER PRICE: You may. What is it?

22 MR. OLIKER: I believe this is IGS
23 Exhibit 15.

24 EXAMINER PRICE: I mean what is the
25 document?

1 MR. OLIKER: It is an excerpt of the
2 Annual Energy Outlook from 2014.

3 EXAMINER PRICE: Is this not already in
4 evidence?

5 MR. KUTIK: It has already been admitted,
6 your Honor. I think we admitted it during the
7 examination of Mr. Wilson.

8 MR. OLIKER: I did not have a copy, so I
9 thought this would be easier.

10 EXAMINER PRICE: Okay. This will be so
11 marked.

12 (EXHIBIT MARKED FOR IDENTIFICATION.)

13 Q. (By Mr. Oliker) Mr. Rose, does this
14 appear to be an excerpt of the 2014 Annual Energy
15 Outlook?

16 A. Yes.

17 Q. Okay. And the EIA provides their number
18 in tcf rather than bcf, tcf per day.

19 MR. KUTIK: So the question to the
20 witness is what?

21 MR. OLIKER: I can rephrase, your Honor.

22 EXAMINER PRICE: Just reread it.

23 We'll have Mr. Oliker rephrase.

24 Q. (By Mr. Oliker) Okay. Mr. Rose, could
25 you turn to M 24. This would help move us along.

1 Would you agree that under Figure MT-46, the EIA has
2 provided several projections of LNG exports, but
3 they're provided in total drill cubic feet as opposed
4 to cubic feet per day?

5 A. Yes. And they are also net as opposed to
6 gross, and they are also for the lower 48, whereas my
7 numbers are for the U.S. and Canada, excluding
8 noncontiguous and not Alaska.

9 MR. OLIKER: Your Honor, I would move to
10 strike everything after my question about the metrics
11 used to quantify these numbers.

12 EXAMINER PRICE: We are going to grant
13 the motion to strike.

14 And, again, Mr. Rose, Mr. Kutik will
15 have -- I let a couple things slide, but Mr. Kutik
16 will have an opportunity to ask you any additional
17 information related on redirect. For now you should
18 just answer Mr. Olikier's questions.

19 THE WITNESS: Yes, your Honor.

20 Q. (By Mr. Olikier) Okay. And if we wanted
21 to convert total cubic feet to bcf per day, we could
22 merely multiply, say, for example, if you look at
23 2020 under the reference case, that's 2 tcf, correct?

24 EXAMINER PRICE: Can I have that question
25 back again, please. I don't understand it.

1 (Record read.)

2 MR. OLIKER: I realize there's multiple
3 steps. That's why I start at the end with the first
4 step.

5 Q. Let's do it this way. 2020 you read the
6 reference case says 2 tcf.

7 A. Yes, I see that.

8 Q. If we wanted to convert that to bcf per
9 day, we would just take the 2 tcf, and we would
10 multiply that by a thousand and divide by 365, right?

11 A. Yes.

12 Q. Okay.

13 A. If you wanted to convert to bcf per day.

14 Q. Yes. So in 2020, would you agree that
15 2000 divided about by 365 is about 5-1/2 bcf per day?

16 A. Yes. In that range.

17 Q. And 2025 under the reference case, it's
18 probably just shy of 3 tcf, correct?

19 A. In 2025, did you ask?

20 Q. Yes.

21 A. Something like that, yes, something on
22 the order of 3.

23 Q. And that works out to somewhere in the
24 range of 7-1/2 or 8 bcf a day?

25 A. Yes.

1 Q. Okay. Would you agree that the EIA has
2 actually a wide range of estimates for LNG exports,
3 and largely because LNG exports are influenced by the
4 price of oil?

5 MR. KUTIK: Objection, compound.

6 EXAMINER PRICE: Sustained. Break them
7 up.

8 MR. OLIKER: Sure.

9 Q. Would you agree, Mr. Rose, that LNG
10 exports are influenced largely by the price of oil?

11 A. I would agree it's a factor.

12 Q. And especially in the Asian LNG market,
13 the price of LNG is usually indexed to the price of
14 oil.

15 A. In my experience it does relate to the
16 price of oil.

17 Q. Okay. So for example, the other
18 influence regarding LNG exports can be the price of
19 natural gas domestically in the U.S., correct?

20 A. Yes, that is a consideration as well.
21 Yes.

22 Q. So if gas is low priced here, then there
23 is a bigger spread between where we can sell it
24 someplace else, right?

25 A. Everything else being equal, yes.

1 Q. Okay. Likewise, when the price of oil is
2 high, then there is a bigger difference between the
3 producing cost of gas and where you -- and the cost
4 for the price you can sell it at somewhere else.

5 THE WITNESS: I'm sorry. Could I have
6 the question reread, please.

7 (Record read.)

8 A. Yes.

9 Q. And going back to Figure 7 on page 37,
10 there was a workpaper for this document, correct?

11 A. Yes.

12 Q. But that workpaper did not identify the
13 specific locations where LNG was being exported to,
14 correct?

15 A. That document did not.

16 Q. And without revealing any of the numbers
17 in that workpaper, it merely identified the increase
18 by sector for each year in demand on a bcf-per-day
19 basis, correct?

20 A. It showed the level and you could
21 calculate the increase.

22 Q. So your -- although the workpaper did
23 not -- scratch that.

24 Would you agree that you also, when
25 asked -- actually, let me ask you today.

1 You can't tell me what amount of natural
2 gas is being exported in LNG form to any specific
3 country; is that correct?

4 A. What I can say is that there's 21 bcfd of
5 signed contracts. This document is out of date by a
6 year, and in this particular case it makes a
7 difference. Those contracts, most of them, can be
8 assigned to either Asia or Europe, and most can be
9 assigned to specific countries.

10 The largest purchasers of LNG under
11 contract are Japan is No. 1. India is No. 2. These
12 are by contracts. The other big purchasers are
13 France, Spain, Portugal, and England. And so there
14 is actually for most of the 21 bcf, which is almost
15 twice my number of signed contracts, you have a good
16 sense where the gas is going.

17 MR. OLIKER: Your Honor, I would move to
18 strike his answer which was not responsive to my
19 question.

20 MR. KUTIK: It was very responsive,
21 directly responsive. You don't know where it is
22 being exported, and he just provided the information
23 on that.

24 MR. OLIKER: I asked if he could quantify
25 it for any specific country.

1 MR. KUTIK: And he just did in terms of
2 contracts.

3 MR. OLIKER: He answered a different
4 question, your Honor.

5 EXAMINER PRICE: This is going to end up
6 being a waste of time. He can ask him on redirect.
7 I will strike that question as nonresponsive.

8 MR. OLIKER: Thank you.

9 EXAMINER PRICE: Mr. Rose, do you have
10 any specific amounts with respect to specific
11 countries?

12 THE WITNESS: I do. I am going to
13 express them in a related unit of tons -- of millions
14 of tons per year, so this will give you a sense of
15 the total number of signed contracts of approximately
16 95. Something on the order of -- of that 95,
17 two-thirds are going to Asia and about one-third is
18 going to Europe.

19 And of the two-thirds that are going to
20 Asia, the largest purchaser is Japan, and they are --
21 these are under contracts. They, together with
22 India, the second largest purchaser, I believe have
23 something on the order of 25 of the 95. And so those
24 are the largest purchasers in Asia.

25 Another purchaser, which is smaller, is

1 China. It has about a third the amount that India
2 has, and they are purchasing -- some of these
3 purchases from Canada, so I am looking at the total
4 of North America. There's purchases by Indonesia
5 that are relatively small. Korea is about the same
6 amount, similar amount to China. You have purchases
7 by New Zealand, Brunei, and Australia. Those numbers
8 tend to be relatively small.

9 As I indicated, the largest purchasers,
10 which are all about in the range of half to
11 85 percent of India, are the Portugal, Spain, France,
12 Germany and England. Those are the five that I
13 remember.

14 EXAMINER PRICE: Thank you.

15 Q. (By Mr. Olikar) Mr. Rose, you didn't have
16 this information at your deposition, did you?

17 A. I did not remember every specific number
18 when I was sitting there.

19 Q. And at the time you couldn't provide any
20 indication of whether the demand in Asia was driven
21 primarily by China and Japan, correct?

22 A. No.

23 Q. You didn't have any quantitative numbers
24 at all, correct?

25 A. I did not provide quantitative numbers.

1 I provided ordinal relationships.

2 EXAMINER PRICE: At this time we are
3 going to break for 10 minutes. We have been going at
4 this quite a while.

5 Let's go off the record.

6 (Recess taken.)

7 EXAMINER PRICE: Let's go back on the
8 record.

9 Thank you, Mr. Olikier. Please proceed.

10 MR. OLIER: Sure.

11 Q. (By Mr. Olikier) Mr. Rose, you agree there
12 are countries besides the United States that export
13 LNG, correct?

14 A. Yes.

15 Q. And one of those countries is Russia,
16 correct?

17 A. I believe so.

18 Q. Okay. And the demand for LNG and natural
19 gas in a specific country is influenced by the amount
20 of natural gas they produce domestically, correct?

21 A. It can be a factor.

22 Q. And do you agree there are countries
23 besides the United States that have shale gas
24 resources?

25 A. Yes.

1 Q. And when you are evaluating the amount of
2 shale gas resources that are available in the world,
3 there are two categories, correct? Proven reserves
4 and technically recoverable resources?

5 A. There are a number of different
6 categories that are relevant. There's proven
7 resources, and then there are resources, and in the
8 resource category, there are different
9 characterizations, technically and economically
10 recoverable. Most of the resources are -- most of
11 the gas is resources, not reserves.

12 Q. And what do you mean by "resources and
13 not reserves"?

14 A. Proven reserves are a small fraction of
15 the total resources.

16 Q. Okay. And you have reviewed estimates of
17 global natural gas reserves, correct?

18 A. I have some knowledge of that in the
19 context of a world LNG study that we conducted, ICF
20 conducted for the American Petroleum Institute, which
21 forecast a 20 percent market share, taking into
22 account those type of resources.

23 Q. And the EIA also conducted its own
24 estimate of global natural gas preserves, correct?

25 A. I'm only aware of resources, not

1 reserves.

2 Q. Okay. Thank you.

3 MR. OLIKER: May I approach, your Honor?

4 EXAMINER PRICE: You may.

5 MR. OLIKER: I believe we are on IGS 16.

6 EXAMINER PRICE: This document will be
7 marked as IGS 16.

8 (EXHIBIT MARKED FOR IDENTIFICATION.)

9 Q. Mr. Rose, I have placed in front of you a
10 document from U.S. Energy Information Administration
11 entitled "Analysis & Projections World Shale Resource
12 Assessments." Do you see that document?

13 A. Yes.

14 Q. Does this appear to be a document
15 produced by the EIA?

16 A. Yes.

17 Q. And the website where it's attainable
18 appears to be on the bottom, correct?

19 A. It so appears.

20 Q. And you've seen this document before,
21 correct?

22 A. Yes.

23 Q. Does it appear to be a true and accurate
24 copy of the EIA's world shale resource assessment?

25 A. It appears to be. It does appear to be

1 so.

2 Q. Okay. And this document discusses
3 "Unproved technically recoverable" shale gas,
4 correct?

5 A. Yes, under the overall category of
6 resources.

7 Q. Okay. And on this list would you agree
8 that these are the largest unproved technically
9 recoverable resources just in China? That's on page
10 2.

11 A. Yes, I see that.

12 Q. And the number is actually nearly double
13 what exists in the United States; is that correct?

14 A. Yes. And, you know, I believe -- and we
15 believe that we can get gas to the coastal region of
16 China faster than China can get it to its coastal
17 region itself.

18 MR. OLIKER: Your Honor, I would move to
19 strike everything after his answer, which was "yes"
20 as not responsive.

21 EXAMINER PRICE: Granted.

22 MR. OLIKER: Thank you.

23 Q. And there are also technically
24 recoverable reserves in both Canada and Mexico,
25 correct?

1 A. Yes.

2 Q. And they are comparable to the United
3 States; is that right?

4 A. The numbers are comparable. The other
5 aspects of their situation are not. And that -- the
6 other aspects that are affecting the competitiveness
7 of those resources are very different. You have
8 different legal situations. For example, in Mexico
9 you have lack of infrastructure to handle production
10 of the gas. There's a lack of clarity with respect
11 to property rights, intellectual protection of the
12 shale gas capability, companies that are experienced
13 in that regard. So there's a lot that's -- that
14 differentiates the resources other than the numbers.

15 MR. OLIKER: Your Honor, I would move to
16 strike everything after the word "the numbers are
17 comparable."

18 EXAMINER PRICE: No. You don't need to
19 respond. You didn't ask him whether the numbers were
20 comparable. You asked if the reserves were
21 comparable. Actually you said "they are comparable"
22 to your previous question, which was reserves.

23 Q. Okay. And would you agree that Iran and
24 Qatar are actually not indicated on the EIA's report?

25 MR. KUTIK: May I have the question read,

1 please in.

2 EXAMINER PRICE: You may.

3 (Record read.)

4 A. I don't see those countries.

5 Q. But you would agree that there are shale
6 resources that are technically recoverable in those
7 countries at the same level as the United States on a
8 quantity basis, if not greater?

9 A. I am aware that they have significant
10 resources, but I can't respond to the quantitative.
11 I haven't memorized that particular data. If you
12 have a source on that, please show me.

13 Q. And Argentina on a quantity basis has
14 greater wet shale gas reserves than the United States
15 as well; is that correct?

16 A. Yes. And they have 27 wells. The
17 Marcella load has got 2,500. They keep
18 renationalizing and confiscating the net -- the
19 natural gas resources and the companies there.
20 There's a pipeline sitting idle to Chile, and I
21 wouldn't put a lot of stock in getting gas out of
22 Argentina, even though there is a lot of recoverable,
23 technically recoverable, reserves.

24 MR. OLIKER: Your Honor, I would move to
25 strike everything after the words "yes."

1 EXAMINER PRICE: We are going to move to
2 strike everything after the word "yes," but we will
3 also ask you to move on. There are, I believe, 200
4 some countries in the world, and we are not going to
5 walk through each and every one.

6 MR. OLIKER: No, we are not, your Honor.

7 Q. And there is one more I want to discuss,
8 but it's actually not on this page. Are you familiar
9 with Turkmenistan?

10 A. What do you mean by "familiar"?

11 Q. I am starting broad.

12 EXAMINER PRICE: Have you ever been
13 there?

14 MR. OLIKER: Planning a vacation.

15 EXAMINER PRICE: Just ask your question,
16 Mr. Olikер.

17 Q. Turkmenistan also exports natural gas; is
18 that correct?

19 A. Could be. I really don't know.

20 Q. And --

21 A. I mean --

22 Q. Do you know how much natural gas your
23 model assumed Turkmenistan delivered to China on a
24 bcf-per-day basis?

25 MR. KUTIK: Objection.

1 EXAMINER PRICE: Grounds?

2 MR. KUTIK: Relevance.

3 EXAMINER PRICE: Mr. Oliker, do you want
4 to help us out with that one?

5 MR. OLIKER: Your Honor's, he's got very
6 aggressive projections regarding LNG exports, which
7 he's indicated are impacted by the influences of
8 supply and demand, and I am trying to explore what
9 are the assumptions, how he got there, and what his
10 foundation for these conclusions are.

11 MR. KUTIK: That would be a proper
12 question. But going country by country, county by
13 county, city by city, region by region is improper.

14 EXAMINER PRICE: I agree with Mr. Kutik.
15 But if you can go ahead and ask the question of the
16 witness that you just posed in defense of your
17 relevance, you might be in business.

18 Q. (By Mr. Oliker) Well, for purposes of
19 calculating -- first, do you know what amount of --
20 before we go back, China is one of the countries
21 you've indicated is a source for LNG exports; is that
22 correct?

23 A. No. I indicated it has a signed contract
24 to purchase North American gas and import it. And I
25 also indicated that there are problems getting gas

1 from the shale fields, many of which are in populated
2 areas and getting it to the coastal areas, and we can
3 get it there quicker. And if there was so much gas
4 out there, why is there 21 bcfd of signed contracts.
5 I only have 12. There is 21 bcfd signed contracts,
6 and that's because there's problems in many of these
7 countries, and they see a -- the advantage of
8 contracting.

9 We have 9 bcfd under construction. This
10 alone, the 21 bcfd of signed contracts would alone
11 result in the largest increase over a 10-year period
12 of gas demand ever. The last time we had it it
13 was -- there were shortages, all kinds of problems in
14 Ohio, and so that's not even counting the other
15 sectors.

16 So, you know, again, I have talked about
17 China, and China is one of the contracting
18 counterparties for North American gas.

19 MR. OLIKER: Can I hear the first
20 sentence of his answer.

21 EXAMINER PRICE: His first sentence was
22 "no."

23 MR. OLIKER: I move to strike everything
24 after "no."

25 MR. KUTIK: May I have the question read,

1 your Honor.

2 EXAMINER PRICE: You can have the
3 question back.

4 MR. OLIKER: I think his answer was
5 internally inconsistent.

6 EXAMINER PRICE: Let's not editorialize.

7 (Record read.)

8 MR. KUTIK: Your Honor, I think his
9 testimony and his response to that question gave his
10 views on China.

11 MR. OLIKER: I asked if it's the source,
12 your Honor.

13 EXAMINER PRICE: Well, actually, you
14 asked if they are an exporter, and he explained why
15 they are an importer.

16 MR. OLIKER: No. I said source for
17 exports of LNG, is the question.

18 EXAMINER PRICE: Let's go back and have
19 the question again. Not what I heard.

20 (Record read.)

21 EXAMINER PRICE: And he said, no, they
22 are not a source for LNG exports. They are a source
23 for LNG imports, and then took advantage of the door
24 you opened to give a lengthy dissertation of why they
25 are importing natural gas.

1 The motion to strike is denied.

2 MR. OLIKER: Okay.

3 Q. (By Mr. Oliker) So now I think I
4 understand the question you answered. China is one
5 of the locations you have indicated as a source for
6 U.S. exports of LNG, correct?

7 A. Yes. And they are -- when I refer --
8 when I am referring to exports of U.S. plus Canada, I
9 think in this particular situation the signed
10 contract is for Canadian gas.

11 Q. Okay. And am I correct that over the
12 next five years or next ten years you do not know
13 what level of domestic Chinese production of natural
14 gas your model assumed?

15 A. I don't think that's a fair question or a
16 useful question. It's hard for me to answer because
17 the model that we have is very detailed with respect
18 to United States, Canada, and Alaska. It is as a
19 result of other studies has assessments of the export
20 demand for LNG. It does not have as detailed a
21 characterization of China.

22 But we have looked at various different
23 markets that contributed to the world market, and
24 even though it is not immediately in the model, it is
25 addressed in some of the assumptions that go into the

1 model, and these assumptions are based on the things
2 that you are talking about, plus actual signed
3 contracts.

4 Q. And the amount of demand for LNG in China
5 will be influenced by the amount of natural gas they
6 produce domestically; is that correct?

7 A. Yes, and influenced by the various
8 different problems that they are having, pricing
9 regimes that are, of all things, discouraging shale
10 gas production.

11 Q. And the amount of demand in China for LNG
12 will also be influenced by the amount of natural gas
13 they pipe in from Russia; is that correct?

14 A. Yes. But as I indicated, that's going to
15 take a while, and I think we can get the gas to them,
16 "we" being North America, can get it to them quite
17 fast and to the coastal areas, and that's a critical
18 distinction, characteristic, and our forecast, our
19 maximum forecast, the highest number I have in the
20 model is 12, and there's already 21 bcfd signed
21 contracts.

22 MR. OLIKER: I think I would move to
23 strike everything after his answer, which was "yes."

24 MR. KUTIK: Your Honor, he was asked to
25 characterize the influence of Russia's pipeline into

1 China, if there was one.

2 MR. OLIKER: Yes. And he provided an
3 answer about something completely different.

4 EXAMINER PRICE: No. He responded as to
5 he thought North America was a better export.

6 MR. OLIKER: It was a different question,
7 your Honor.

8 EXAMINER PRICE: I am trying to read the
9 transcript, and every time you say something, it
10 moves up the computer screen.

11 I am going to grant part of your motion
12 to strike. We are going to begin the motion to
13 strike with "and" after "characteristic" and strike
14 the phrase "and our forecasts, our maximum forecasts,
15 the highest number I have in the model is 12 and
16 there is 21 signed contracts."

17 MR. KUTIK: So it's the last sentence of
18 his answer, basically?

19 EXAMINER PRICE: Basically, yes.

20 Q. And isn't it true that just this past
21 summer the Russian Parliament ratified a contract
22 with China regarding the pipelining of 1.3 bcf per
23 day?

24 MR. KUTIK: Objection, at this point,
25 your Honor.

1 EXAMINER PRICE: Grounds?

2 MR. KUTIK: Assumes facts, relevance,
3 asked and answered.

4 MR. OLIKER: This question, your Honor,
5 has not been asked. And if he knows, he knows. It
6 is not assuming any facts. I am asking about his
7 knowledge.

8 MR. KUTIK: No, you didn't. You asked
9 about a specific fact.

10 EXAMINER PRICE: Let's go off the record
11 for a second.

12 (Discussion off the record.)

13 EXAMINER PRICE: Let's go back on the
14 record.

15 The witness can answer the question if he
16 is aware.

17 A. I have no knowledge of those
18 arrangements, but I haven't reviewed them in detail.

19 MR. OLIKER: May a approach, your Honor?

20 EXAMINER PRICE: You may.

21 MR. OLIKER: I believe this is IGS
22 Exhibit 17.

23 (EXHIBIT MARKED FOR IDENTIFICATION.)

24 Q. Mr. Rose, I have placed in front of you a
25 document from the US Energy Administration from

1 August 20, 2014 titled "Russian-China deal will
2 Supply Siberian natural gas to China's northern,
3 eastern provinces." Do you see that document?

4 MR. KUTIK: Objection.

5 EXAMINER PRICE: Grounds.

6 MR. KUTIK: Hearsay.

7 MR. OLIKER: Your Honor, this is an EIA
8 document. Mr. Rose has been relying on EIA
9 documents, and it's reporting facts that have been
10 recorded by the EIA in transactions regarding natural
11 gas.

12 MR. KUTIK: This is a report just like
13 any other report of news, your Honor. It is not a
14 compilation. It is not a market compilation, and
15 just because it's produced by the EIA doesn't
16 magically make it not hearsay.

17 MR. OLIKER: If you look at Mr. Rose's
18 own testimony, your Honor, he has a very similar type
19 of document that he cites to.

20 MR. KUTIK: Similar ain't close enough.

21 EXAMINER PRICE: First of all, both
22 counsel should at least attempt to get my attention
23 so I can recognize you instead of talking to each
24 other.

25 I certainly agree with every hearsay

1 objection that Mr. Kutik is making. Nonetheless, we
2 will stretch the hearsay exceptions of this
3 particular "Today in Energy" news article from the
4 EIA.

5 MR. KUTIK: I have a further objection,
6 your Honor, with respect to foundation.

7 EXAMINER PRICE: He hasn't answered the
8 question yet, so.

9 MR. KUTIK: Fair enough.

10 THE WITNESS: Could I have the question
11 repeated, please.

12 EXAMINER PRICE: You may.

13 (Record read.)

14 A. Yes, I see the document.

15 Q. Does that appear to be a document from
16 the Energy Information Administration?

17 A. Yes, sir.

18 Q. And it's titled "Today in Energy,"
19 correct?

20 MR. KUTIK: Objection.

21 EXAMINER PRICE: Grounds?

22 MR. KUTIK: It's time to ask the
23 question, your Honor, has he seen the document
24 before? Is he familiar with the document? Rather
25 than reading from the document.

1 EXAMINER PRICE: I agree.

2 Have you seen the document before?

3 THE WITNESS: No.

4 EXAMINER PRICE: Are you otherwise
5 familiar with the contents of the document from other
6 sources?

7 THE WITNESS: Yes. And I would emphasize
8 the last sentence, which says, "New production along
9 with imports of LNG," which is what we have been
10 talking about, "will meet rising demand in China's
11 eastern and southern coastal regions," which is what
12 I have been saying.

13 The coastal areas are prime LNG markets
14 for the United States, and it's more than prime where
15 there is also signed contracts.

16 Q. Mr. Rose, "Today in Energy" is the same
17 website on the EIA that you rely upon in footnote 51
18 on page 38, correct?

19 A. Yes, it is "Today in Energy," but not
20 this particular one.

21 Q. Okay. But in Exhibit -- first, you
22 mentioned that you have a familiarity with these
23 transactions. Are you aware that Turkmenistan has a
24 contract with Russia for the delivery of natural gas?

25 MR. KUTIK: Objection.

1 EXAMINER PRICE: Grounds.

2 MR. KUTIK: We are legally far afield,
3 your Honor. I mean, this is first we are talking
4 about China, and then we are talking about Russia. I
5 don't think we have talked about anything in terms of
6 Russia other than exporting to China, and now it's
7 Russian having a deal with Turkmenistan.

8 MR. OLIKER: That wasn't my question,
9 your Honor.

10 MR. KUTIK: Well, he pointed to -- he
11 pointed to the Turkmenistan deal.

12 MR. OLIKER: With China.

13 EXAMINER PRICE: We are going to -- okay.
14 To be clear, we are going to allow Mr. Olier a
15 little bit of leeway, but we are running out of time
16 for the global petrochemical discussion.

17 MR. OLIKER: It's almost coming to an
18 end, your Honor.

19 MR. KUTIK: We've heard I think this is
20 the third time, your Honor.

21 EXAMINER PRICE: He said he only had a
22 couple more points.

23 MR. KUTIK: He said that a couple more
24 points a while ago.

25 EXAMINER PRICE: The witness can answer

1 the question.

2 THE WITNESS: Can I have the question
3 read back to me, please.

4 EXAMINER PRICE: You may.

5 (Record read.)

6 MR. KUTIK: It was Russia, your Honor.
7 That was the question.

8 Q. Then my question had an error in it. Are
9 you aware that, Mr. Rose, Turkmenistan and China, is
10 there a contract for the delivery of gas?

11 A. I have no knowledge of that. I have no
12 knowledge of that other than this document.

13 Q. And are you aware that Gazprom -- first,
14 are you familiar with the company Gazprom in Russia?

15 A. I have heard of it.

16 Q. And you agree they signed the pipeline
17 deal with China this past year for delivery of
18 natural gas to China?

19 MR. KUTIK: Objection.

20 EXAMINER PRICE: Grounds?

21 MR. KUTIK: Relevance. Asked and
22 answered.

23 EXAMINER PRICE: This witness has
24 indicated that the source of his LNG prices are
25 export numbers and that they are based upon contracts

1 that are signed.

2 MR. OLIKER: That's not what his
3 testimony says, your Honor.

4 MR. KUTIK: It's what he testified to
5 today.

6 EXAMINER PRICE: It's what he testified
7 to when you asked him the questions, the follow-up
8 questions. We are going to allow the question but we
9 are seriously at the time to wrap this up. Go ahead
10 and answer the question about the Gazprom.

11 A. Again, I see that Gazprom seems to have a
12 deal from this document. I don't know who all the
13 counterparties and signatories are of that
14 particular --

15 EXAMINER PRICE: But you do know who
16 Gazprom is.

17 THE WITNESS: I do know who Gazprom is.

18 EXAMINER PRICE: And this document
19 indicates it's Russia's largest natural gas company.

20 THE WITNESS: I was aware of that, and it
21 does also say that.

22 Q. (By Mr. Olikar) Okay. And to tie this
23 together, going back to the countries we've been
24 discussing that have shale reserves that they're not
25 currently exploring, such as Argentina, Mexico,

1 Canada, and China, you don't know in what year, if at
2 all, your model assumes they developed their shale
3 gas resources?

4 A. First of all, the question is incorrect
5 in its predicate. We do forecast and are assessing
6 significant shale production and activities in
7 Canada. I just indicated that a portion of the
8 exports that I have been talking about are coming
9 from Canada. The document I had provided to you
10 earlier, which I can see from over here says U.S. and
11 Canada, so that predicate -- that predicate is
12 incorrect.

13 I don't have all of the numbers for every
14 year memorized, but there is significant activity in
15 Canada, and that was one of the things you were
16 saying in your question that is not true.

17 Q. So apart from Canada, was my question
18 true?

19 THE WITNESS: Can you please repeat the
20 question?

21 MR. KUTIK: May we have the question
22 read, your Honor?

23 EXAMINER PRICE: Yes, please.

24 (Record read.)

25 A. So we discussed Canada, and the model is

1 of -- has detail about Canada, so if I had all of the
2 numbers coming out of the model, and there is
3 millions of them, I would be able to give you a
4 detailed description of Canada.

5 With respect to Argentina, I think you
6 asked about, that is a -- an assessment we have done
7 of that country and some other countries is subsumed
8 in the study that I referred to earlier, which shows
9 we believe it's reasonable for the United States to
10 have a 20 percent market share, but the model itself
11 does not characterize in detail Argentina.

12 Q. And does the model characterize in detail
13 the amount of shale gas that China will explore
14 domestically?

15 EXAMINER PRICE: Will?

16 MR. OLIKER: Explore domestically.

17 A. No, not in detail.

18 Q. And the same question about Mexico?

19 A. It does not have the same level of detail
20 as it does for U.S. and Canada, for contiguous U.S,
21 Alaska and Canada.

22 EXAMINER PRICE: I would like to follow
23 up with that one. You do indicate in Figure 7
24 exports to Mexico, an increase in demand. Are you
25 saying that you do not -- the model does not take

1 into account Mexico's domestic production of shale
2 gas?

3 THE WITNESS: It doesn't account for it
4 in detail, so what it is we have done an assessments
5 of what's going on in Mexico, and there is shale gas
6 there, and it actually looks like it's potentially
7 very good shale gas.

8 But what's happening is that it's not
9 clear who actually owns the gas, whether -- what type
10 of protections there would be. There is very little
11 infrastructure in that area to handle the gas. And
12 what we're observing, we are observing it and so is
13 other entities, that they are actually laying a
14 significant amount of pipeline, as we speak, from the
15 United States, in particular, from Texas and other
16 border areas, and that there has been already a
17 significant increase in the last few months in terms
18 of exports to Canada -- to Mexico.

19 And the reason for it is a combination of
20 a huge effort on the part of their government to
21 import gas from the United States, and the fact that
22 they are having a lot of trouble developing their own
23 shale gas resources. And in this particular case,
24 it's not that the geology is bad. It's just
25 everything else, the institutional arrangements, the

1 fact that it's a governmental entity. They don't
2 have a private sector. No one sort of knows exactly
3 what the rules are has been a huge impediment.

4 Taking that into account, that has led us
5 to conclude there is going to continue to be
6 significant growth in exports to Mexico.

7 EXAMINER PRICE: Thank you.

8 Q. (By Mr. Oliker) Okay. We've talked a lot
9 about the demand-side switching to the production
10 side. Would you agree -- first, would you agree
11 there are wells that have been drilled but not
12 fracked or connected to a pipeline within the
13 Marcellus and Utica region?

14 A. Yes. As I indicated earlier, that the
15 Marcellus earlier this year had around a thousand
16 drilled but not -- uncompleted wells.

17 Q. What sources do you use to get that
18 information?

19 A. There are various different reports,
20 including governmental reports that have that
21 information.

22 Q. Which ones do you look at specifically?

23 A. I'd have to go back. I think that
24 particular number, a thousand drilled, uncompleted
25 wells in the Marcellus earlier this year, there's

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1 this particular reference in mind, but I have to go
2 back and check. I don't remember sitting here.

3 Q. Do you look at Bentek?

4 A. It's possible that was the source, but I
5 have to go back and check.

6 Q. Did you talk to individuals at Bentek?

7 A. I have in the past.

8 Q. Who do you talk to there?

9 MR. KUTIK: Well, I object.

10 EXAMINER PRICE: Grounds?

11 MR. KUTIK: Relevance.

12 EXAMINER PRICE: Sustained.

13 Do you have a Bentek document?

14 MR. OLIKER: I do.

15 Q. (By Mr. Oliker) Would you agree that
16 individuals identify the amount of drilled but
17 uncompleted wells between Marcellus and Utica being
18 above 2,500?

19 MR. KUTIK: May I have the question read,
20 please?

21 EXAMINER PRICE: You may.

22 (Record read.)

23 MR. KUTIK: "Individuals," your Honor?

24 MR. OLIKER: Happy to clarify.

25 EXAMINER PRICE: Please.

1 Q. (By Mr. Olikier) Would you agree that
2 analysts -- well, I'll say it again. Would you agree
3 that the facts taken from the Ohio Department of
4 Natural Resources and the Pennsylvania Department of
5 Resources have identified the amount of wells that
6 have been drilled but not completed to be above 2,500
7 between the Marcellus and Utica region?

8 MR. KUTIK: Objection, assumes facts.

9 EXAMINER PRICE: Sustained.

10 Just give him the document. See if he
11 can identify it.

12 MR. OLIKER: May I approach, your Honor?
13 IGS 18, I believe.

14 EXAMINER PRICE: Sure.

15 He can or he can't.

16 Are you going to give one to the Bench?

17 The document will be marked as IGS 18.

18 (EXHIBIT MARKED FOR IDENTIFICATION.)

19 Q. Sir, you indicate --

20 MR. KUTIK: May I have a minute, your
21 Honor?

22 EXAMINER PRICE: You may.

23 MR. KUTIK: Thank you, your Honor.

24 Q. Mr. Rose, the document that's been marked
25 as IGS Exhibit 18, does that appear to be a document

1 from Bentek Energy authored by Chris Foster?

2 A. It appears to be an excerpt.

3 Q. Okay. Thank you. So have you seen this
4 document before?

5 A. No.

6 EXAMINER PRICE: Was this document the
7 source of your thousand wells?

8 THE WITNESS: No. I don't believe so.
9 It was dealing with drilled and uncompleted, not
10 these other categories.

11 Q. And I think you responded to the Attorney
12 Examiner about the second page of the document, the
13 excerpt, and have you seen similar reports regarding
14 well inventory?

15 A. No, I have not seen this measure. I've
16 followed -- I follow different measures.

17 Q. What do you mean by different measures,
18 Mr. Rose?

19 A. So I am following the drilled and
20 uncompleted, and I am also following the actual
21 resources that are in the ground, so we have access
22 to the actual mile-by-mile characterization of the
23 shale gas resources, and we use that to make
24 projections of the amount of gas that's available,
25 taking into account the declining rates of gas that's

1 already been drilled and completed and the potential
2 for additional wells.

3 Q. Do you believe that an estimate of 19B
4 bcf per day of trapped production is reasonable in
5 the Marcellus region and Utica?

6 A. So on page 35 of -- on page 35, Figure 5,
7 we show a fairly similar increase in Marcellus plus
8 Utica output. So we have an increase that goes from
9 14 to 33. So that's turns out to be exactly 19, if I
10 did my math right, from 14 to 33, yeah.

11 So in that sense we do see and are
12 projecting a very large increase. That's going to be
13 a lot of work because you have to make up for the gas
14 that's being depleted from the wells they have
15 declined as well as the increase in demand.

16 Q. Could you give me that reference again on
17 page 35? Were you referring to Figure 4 or Figure 5?

18 EXAMINER PRICE: Figure 5.

19 Q. And would you agree that 19 bcf per day
20 is actually greater than the current production in
21 Marcellus shale and Utica?

22 A. Yes. As I indicated, the numbers I was
23 working with was 17 production -- recent production,
24 current production, around that number; 15 in the
25 Marcellus, 2 in the Utica, and you can see there is a

1 19 bcfd increase shown here on Figure 5.

2 Q. On page 5, line 19 through 25 of your
3 testimony, you state that the price forecasting
4 principles for natural gas prices should rely on
5 modeling of supply, and --

6 A. Hold on. Page 5, what?

7 MR. KUTIK: 19 to 25.

8 Q. Would you agree we've seen that natural
9 gas suppliers actively produce gas when the price
10 hits a certain trigger level?

11 A. I mean, I don't think there is a magical
12 trigger level. It's more that when prices go up, you
13 end up having more supply. That's an important
14 modeling characteristic. And the converse is also
15 true, so when we have a 60 percent drop in the
16 drilling, it's showing that your prices are too low
17 to support ongoing drilling activity.

18 So it goes both ways, and what I am
19 referring to here is certain techniques for modeling
20 supply and demand, and you need to do that in order
21 to have an acceptable forecasting approach.

22 Q. So your model doesn't have an assumption
23 that causes the rate count to increase or decrease
24 based upon a certain price?

25 A. It is providing output which requires

1 rigs, so it's forecasting price and quantity pairs
2 for various different plays and various different
3 locations in the country and different time periods.

4 Q. So what is the price that is necessary to
5 create additional output in the Marcellus region
6 assumed by your model?

7 A. There is no specific price, that is,
8 there's a very detailed characterization of various
9 different geologic plays. Each geologic play has its
10 own cost of production. So the price has to get to
11 the level that will allow each individual resource to
12 come online, and what we are seeing is that there is
13 a major increase that we're forecasting in Marcellus
14 output; that Marcellus is not the United States, it's
15 part of the United States. It's not the whole United
16 States, and by the time it gets up to the number that
17 we have been talking about, it will be something on
18 the order of only 30 or 35 percent of North American
19 production.

20 Q. Okay. So I think -- I think you answered
21 my question indirectly. I want to be sure. The
22 trigger your model uses is a comparison of the cost
23 of production to the price that that gas can be sold
24 at?

25 A. Yes.

1 Q. And what is that benchmark point in the
2 Marcellus region?

3 MR. KUTIK: Asked and answered. He said
4 there isn't one particular price.

5 EXAMINER PRICE: Sustained.

6 Q. Is there a particular price that your
7 model assumes that causes additional production to
8 come online in the Eagleford region?

9 MR. KUTIK: Like the car.

10 A. There is no specific price because we
11 have various different resources, various different
12 geologic and geographic and cost characteristics in
13 Eagleford, including various different levels of
14 natural gas liquids, but also difference in porosity,
15 depths, and location.

16 So there's no single resource in -- there
17 is no single. There is no single -- there is no
18 single resource and, therefore, no single trigger
19 price.

20 EXAMINER PRICE: Is that going to be true
21 of any geologic formation I might pose to you?

22 THE WITNESS: Any major one, yes, in
23 North America because we worked with ANGA, the
24 Association of Natural Gas Producers. They gave us
25 all of their shale data on one-mile-by-one-mile basis

1 in the United States. We can't release that data,
2 but what we can do is characterize it, and we have
3 taken that and other information, and created
4 individual supply geologic plays that have cost
5 characteristics.

6 And it varies even within these areas.
7 Like Eagleford is still a big area. Marcellus is
8 huge. We just don't have a single number for each
9 individual region. There is multiple resource
10 characterizations in each region.

11 Q. And by ANGA you mean America's Natural
12 Gas Alliance?

13 A. Yes.

14 Q. Do you find them to be a credible
15 organization?

16 MR. KUTIK: Objection.

17 EXAMINER PRICE: Grounds?

18 MR. KUTIK: What does that mean? For
19 what?

20 Q. Do you respect their opinions?

21 MR. KUTIK: Objection.

22 EXAMINER PRICE: I'll allow the question.

23 A. The only thing I can say it was a
24 valuable exercise for them to reveal to us their
25 geological data related to shale gas of the United

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1 States on a highly detailed level.

2 Q. Okay. And there's been some discussion
3 at various times today about connection between rig
4 count and production. Could you turn to Figure 2,
5 page 33, I believe it is?

6 A. Yes, sir.

7 Q. And I think you indicated that the rig
8 count dropped by 55 percent from June of 2014 to July
9 of 2015; is that correct?

10 A. Yes. You are referring to page 32, lines
11 1 and 2?

12 Q. Yes.

13 A. Yes, that's total rig count.

14 Q. And in June of 2014, the rig count was
15 around 300, right?

16 EXAMINER PRICE: Why don't you try again,
17 Mr. Oliker.

18 Q. Natural gas.

19 A. But it's the sum of the two that is the
20 most important, and as you can see, you have to add
21 the gas and the oil, so it was 300 plus 1,600, so it
22 was getting close to 2,000, 1,900, something on that
23 order, against exactly what the numbers are, and then
24 it drops off -- the sum of the two drops off
25 dramatically, and that's what I am talking about on

1 page 32, lines 1 through 3.

2 MR. OLIKER: I would move to strike
3 everything after I think he said "yes."

4 MR. KUTIK: Your Honor, this witness has
5 testified previously the designation of gas or oil
6 rig is a self-identifying characteristic, and so
7 looking at one and not both is irrelevant, and that
8 was his point.

9 MR. OLIKER: Whether or not it's
10 relevant, it's not responsive to my question, your
11 Honor. And whether he provided that earlier it's
12 still not answering the question I posed to the
13 witness.

14 EXAMINER PRICE: Sustained -- I mean
15 granted, the motion to strike.

16 Q. Okay. And would you agree in June of
17 2014 production was very close to 2 tcf?

18 A. Are you referring to the United States?

19 Q. Yes.

20 A. I don't have the specific monthly
21 numbers. The average monthly production in the
22 United States is somewhere between 2 and 3. I don't
23 know how close it was to 2 in June.

24 Q. Okay. And the natural gas rig count in
25 July of 2015 was around 200, pretty close to that

1 number, correct?

2 A. Yes. The self-identified gas directed
3 number is 200.

4 MR. KUTIK: Excuse me, were you finished
5 with your answer, sir?

6 THE WITNESS: The oil directed number is
7 600.

8 MR. OLIKER: Your Honor, I would move to
9 strike his response about oil.

10 EXAMINER PRICE: Granted.

11 Q. And in July of 2015, the natural gas
12 production rate in the U.S. was about 2.2 tcf, right?

13 A. If you have a specific source, I will
14 look at it. I have the same answer I had before,
15 which I haven't memorized each monthly production
16 number, and the average U.S. production by month is
17 approximately 2 to 3 tcf.

18 Q. And going back to July of 2011, the
19 natural gas rig count was about 800 or 900 dollars;
20 is that correct?

21 A. Yes. The self-identified gas rig count
22 was around that number.

23 Q. And at that time production was right
24 around 2 tcf, right?

25 A. The same response I had before, and even

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1 more so, because I don't remember the 2011 numbers.
2 I remember the 2011 numbers is even less than the
3 2015 numbers. If you have a source, I would be glad
4 to look at it.

5 Q. And in your deposition you believe it was
6 probably close to 2; is that correct?

7 A. Do you have a reference in my deposition?

8 Q. Could you turn to page 94? Let me know
9 when you are there.

10 A. I'm there.

11 Q. And this is on page 94, at line 14:

12 "Maybe I can help you. Would you agree,
13 subject to check, that in July of 2011, according to
14 the EIA, the U.S. produced 1.936 tcf?"

15 Answer: "I'm sorry. I am not sure what
16 subject to check means.

17 "You know, I don't have a three decimal
18 point memory for July 2011"

19 Question: "How about close to 2 tcf?"

20 Answer: "You know, I am not sure what
21 close means. It might round to 2. I would have to
22 check."

23 Is that correct, Mr. Rose?

24 MR. KUTIK: Objection.

25 EXAMINER PRICE: Grounds?

1 MR. KUTIK: Improper impeachment, if
2 that's what this was.

3 EXAMINER PRICE: Response.

4 MR. OLIKER: Your Honor, he said, "I
5 would have to check, but I think it might round to
6 2," which is my question.

7 EXAMINER PRICE: That's not what he said.
8 What he said is, "You know" -- after you prompted
9 him, "How about close to 2?" He said, "You know, I'm
10 not sure what close means. It might round to 2. I
11 would have to check."

12 MR. OLIKER: That's what I thought he
13 meant, okay.

14 MR. KUTIK: So my objection, your Honor?

15 EXAMINER PRICE: Sustained.

16 Q. (By Mr. Olikier) Mr. Rose, after your
17 deposition, did you check what the production rates
18 were in July of 201?

19 MR. KUTIK: Your Honor, the witness has
20 said he doesn't have a recollection.

21 EXAMINER PRICE: He can answer this
22 question as to whether he happened to look it up.

23 THE WITNESS: No, sir.

24 EXAMINER PRICE: Mr. Olikier, you may
25 proceed.

1 MR. OLIKER: Thank you, your Honor.

2 Q. Turning to page 5, line 24 and 25, when
3 you were talking about --

4 A. I'm sorry page 5, lines 20 -- I am not
5 sure.

6 EXAMINER PRICE: Lines 24 and 25.

7 THE WITNESS: Thank you, your Honor.

8 Q. Maybe better turn to page 40. I'm sorry.
9 You indicate that NYMEX forward prices are only
10 reliable for a few years; is that correct?

11 A. That's what it says there. I have
12 additional comments that are similar to that but a
13 little bit different, so, I mean, that's what it does
14 say.

15 Q. Am I correct that NYMEX is not the only
16 platform that is traded on regarding natural gas
17 futures?

18 A. Yes.

19 Q. NYMEX -- or natural gas futures are also
20 traded on the Intercontinental Exchange; is that
21 correct?

22 A. Yes.

23 Q. And, in fact, as you go out further than
24 three years, would you agree you are more likely to
25 see trades occurring on the Intercontinental Exchange

1 than you are on the CME group or NYMEX?

2 A. I think that could be the case in -- when
3 I looked at it, there's been more on ICE, but it's
4 still very low, and it decreases dramatically over
5 time, just like the NYMEX.

6 Q. But to be clear, you will see on ICE
7 transactions occurring out in 2026, correct?

8 A. If you have a particular source. I don't
9 remember seeing hardly any transactions beyond the --
10 beyond the first five years. And any transaction in
11 2026 is an isolated, low-liquidity number, and most
12 of the time when they are reporting out in that
13 period of time, there is no transactions.

14 Q. Okay. So am I correct that you would
15 likely see transactions on ICE for at least five
16 years out with liquidity?

17 A. No. You would see lots of liquidity in
18 the first two years, a dramatic drop in the third and
19 fourth year, very little in the fifth year, and then
20 it starts asymptotically getting to zero, and so
21 that's the problem with relying on the futures, which
22 is as soon as you try to go into the marketplace, you
23 actually move the price, and a lot of times the
24 reporting price -- I just did a document earlier that
25 had four years of prices in, like, five months of

1 transactions, so it gets very illiquid over time.

2 Q. Do you look on ICE from time to time,
3 Mr. Rose?

4 A. Yes.

5 MR. OLKER: I will mark an exhibit, your
6 Honor. I think we are on IGS 18.

7 EXAMINER PRICE: It will be so marked as
8 IGS 19.

9 (EXHIBIT MARKED FOR IDENTIFICATION.)

10 MR. OLKER: That's what I get for
11 trusting Sierra Club.

12 Q. Mr. Rose, could you take a look to look
13 at the document that's been marked as IGS Exhibit 19?

14 A. Yes, sir.

15 Q. And does this appear to be a printout
16 from ICE for October 21? Is this the form it would
17 be in?

18 A. It is similar to the format I've seen
19 before. It's not exactly the same, but overall it
20 looks similar.

21 Q. And the contracts that we've been
22 discussing that would be under "OI"; is that correct?

23 A. That would be one parameter. Another
24 parameter would be "Total Volume" of transaction,
25 which goes to zero over time.

1 Q. And by "over time" you are referring to
2 out past 2022?

3 A. It goes to zero past December, 2022.
4 And, obviously, it's decreasing very dramatically
5 over time, well before that. And a single individual
6 large combined-cycle who wanted to hedge all of its
7 volume would need approximately 70 contracts for a
8 single plant, and so you could see once you get out
9 in the out years, even an individual company could
10 start moving the price, it could become a substantial
11 portion of the volume.

12 Q. And if a natural gas combined-cycle plant
13 wanted to procure a contract, it could also contact a
14 producer directly, correct?

15 A. It might be able to, but then it would
16 have sort of credit concerns that you wouldn't have
17 through an exchange. It would have -- it would have
18 delivery risk that you wouldn't have, and it would be
19 a physical transaction. It's possible. It doesn't
20 happen very often, and, obviously, there is a lot of
21 credit problems right now in the oil and gas sector,
22 so it would make it pretty difficult to do.

23 EXAMINER PRICE: Okay. The record on
24 this exhibit is incredibly not clear.

25 Mr. Rose, what does "Total Volume"

1 signify?

2 THE WITNESS: My understanding is the
3 volume of transactions that are -- have occurred
4 in -- for some period of time. I believe it's for
5 the date in question, but I'm not sure.

6 EXAMINER PRICE: And what does "OI"
7 signify?

8 THE WITNESS: Outstanding interest, so it
9 may be a contract that has been created but hasn't
10 transacted that particular period of time.

11 EXAMINER PRICE: Thank you.

12 MR. OLIKER: If I could have a minute,
13 your Honor.

14 EXAMINER PRICE: You may. Let's go off
15 the record.

16 (Discussion off the record.)

17 EXAMINER PRICE: Let's go back on the
18 record.

19 Mr. Oliker.

20 MR. OLIKER: Sure.

21 Q. (By Mr. Oliker) Mr. Rose, isn't it true
22 that the PUCO uses the NYMEX price to establish
23 default service for natural gas customers in Ohio?

24 MR. KUTIK: Objection.

25 EXAMINER PRICE: Grounds?

1 MR. KUTIK: Relevance.

2 EXAMINER PRICE: Let's see where he takes
3 it.

4 Go ahead. You can answer the question,
5 if you know.

6 A. I haven't followed that issue.

7 Q. Do you know of any natural gas utilities
8 that establish default service prices based upon
9 NYMEX Henry Hub natural gas?

10 MR. KUTIK: Same objection, your Honor.

11 EXAMINER PRICE: I think, Mr. Olikar, you
12 need to specify in your question whether you are
13 asking whether they are using the spot price or a
14 20-year contract or a 10-year contract or a 5-year
15 contract because all of those are possible answers.

16 MR. OLICKER: Okay.

17 Q. Mr. Rose, do you know of any natural gas
18 utilities that establish a default service price
19 based upon the monthly natural gas NYMEX price plus
20 an adder?

21 A. I don't have a specific instance in mind.
22 It's not uncommon to be using the near-term, next
23 month, particularly the prompt month, but to my
24 knowledge, using it for year six, seven, eight, nine,
25 ten, it just doesn't happen for anything.

1 Q. Okay. And can you for a second please
2 turn to Sierra Club Exhibit 86, which is the
3 Short-Term Energy and Winter Fuels Outlook, and
4 particularly I am on page 2.

5 A. Hold on one second, please. The
6 Short-Term Energy and Winter Fuels Outlook.

7 Q. Yes. And I'm on page 2 under Natural Gas
8 Inventories. Would you agree that the EIA projects
9 we are going to go into this winter heating season
10 with record storage levels of 3,956 for the month of
11 October?

12 A. I see that was what it says here.

13 Q. Also, Mr. Rose, would you agree that
14 today was a storage data release date, as a Thursday?

15 EXAMINER PRICE: You don't have to answer
16 that.

17 If you have got something to bring out,
18 it doesn't matter whether he knew today was the day
19 or not.

20 MR. OLIKER: I am just trying to lay
21 foundation, your Honor.

22 EXAMINER PRICE: I know, but seriously.

23 MR. OLIKER: To move along, as we did
24 earlier in the hearing, at this point in time I would
25 like to take administrative notice of the Weekly

1 Natural Gas Storage Report, total inventory in the
2 lower 48 states of 3,877 for the week ending
3 October 3, 2015, released on October 29, 2015 at
4 9:30 a.m.

5 EXAMINER PRICE: We will take
6 administrative notice of that piece of information.

7 MR. KUTIK: Your Honor --

8 EXAMINER PRICE: Yes.

9 MR. KUTIK: For this -- for him just to
10 spout it untethered from any document I think is
11 improper.

12 EXAMINER PRICE: Well, we are taking
13 administrative notice of what the number released
14 today is. If he has incorrectly cited the number,
15 you will have an opportunity to point that out on
16 your brief, but we will take administrative notice of
17 what the weekly report happened to be.

18 MR. KUTIK: Today?

19 EXAMINER PRICE: Today.

20 MR. KUTIK: Fair enough.

21 MR. OLIKER: Just so it's clear, in case
22 I did make a mistake, and don't want to, the number I
23 read was 3,877.

24 Your Honor, my read, my remaining
25 questions, if any, are probably confidential, but I

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1 have his workpaper that it might make sense to mark
2 in the public record.

3 MR. KUTIK: Well, that is a confidential
4 document, your Honor, we ask it be marked in the
5 confidential session.

6 EXAMINER PRICE: We will do it in the
7 confidential session.

8 MR. OLIKER: I believe those are all the
9 questions I have for Mr. Rose.

10 Thank you.

11 EXAMINER PRICE: Thank you.

12 Mr. Kurtz?

13 MR. KURTZ: No questions.

14 EXAMINER PRICE: Mr. McNamee?

15 MR. McNAMEE: I did, but I have
16 reconsidered. Thank you.

17 EXAMINER PRICE: At this time we will go
18 into the confidential session.

19 (CONFIDENTIAL PORTION EXCERPTED.)
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(OPEN RECORD.)

EXAMINER PRICE: We are on the public
transcript.

Mr. Kutik, redirect for the public
transcript?

- - -

FURTHER REDIRECT EXAMINATION

By Mr. Kutik:

Q. Mr. Rose, you were asked some questions

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1 about NYMEX GAGS prices for 2016 and to date 2015.
2 You were also asked about your forecast for those
3 years, and being -- or at least part of that period.
4 And being that your forecast was 30 percent higher
5 than the actual spot prices, what is the reason for
6 that?

7 A. I took a futures price. I used the
8 futures price for the first two years for gas, so I
9 took it from April -- May, April of 2014, and it
10 turns out the futures price and the actual spot
11 price, which actually go together, went down, and so
12 that has resulted in a situation in which my gas
13 price forecast is higher than the year-to-date
14 number.

15 However, if I was to replace that with
16 the most recent futures for the next to years, it
17 would not -- on average it would be a moderate effect
18 on my price forecast. It would bring me back down to
19 the -- on average to the EIA levels. It would have
20 an even smaller -- I am only 4 percent in real
21 dollars higher than the EIA, and it would bring my
22 number approximately down to the EIA number if I
23 adopted the most recent gas prices.

24 And it would have something on the order
25 of a 1 or 2 percent effect on the average electrical

1 energy price over the long term, because the gas
2 price effect today on the electrical energy price is
3 muted. Coals on the margin a lot, and it would have
4 an even smaller effect, on the order of 1 to
5 2 percent under my average electrical energy price.

6 Q. You were also asked some questions about
7 Mr. Comings' capacity price number for 2018, for
8 2018-'19, and that Mr. Comings' number was closer to
9 the result of the auction. Does that mean his view
10 of capacity prices is correct?

11 A. No. I think he was closer for this one
12 particular number, but I think he is going to be low
13 for the future years, and he was right, but it was
14 closer for the wrong reason. And in particular he is
15 not taking into account the fact that the capacity
16 performance product has only partly been implemented,
17 so we are going to have a full implementation
18 starting May of 2017.

19 And when we have the full implementation
20 load of 25 percent increase in the demand, and so we
21 will have a significantly higher demand for the
22 capacity product and a significantly higher capacity
23 price, and I don't believe he is taking that into
24 account because he's used a number that's half of
25 CONE, half of net CONE, and he has not -- he is not

1 modeling the supply and demand dynamics.

2 Also, over time, as I have indicated,
3 there's the -- there's the -- in my view as there is
4 no punitive steps taken against bidders who are
5 implementing the actual clear instructions of the
6 FERC order relating to bidding, I believe that
7 they'll tend to increase their bids over time to get
8 closer to the bid cap as they get more comfortable
9 with the new legal regime.

10 I think there is a lot of sensitivity
11 about these types of issues, and I think that's
12 something that also is not being accounted for, so
13 when I do -- when I am looking at my forecast, I am
14 coming up to a number that is higher, and it's taking
15 into account factors that Mr. Comings is not taking
16 into account and, therefore, he will be too low in
17 the long-term average.

18 Q. Mr. Rose, I want to refer you to Sierra
19 Club Exhibit 87.

20 A. Yes.

21 Q. And specifically I would like to direct
22 you to the Exhibit No. 1 in that exhibit on page 2.
23 What would an informed reader take away from that
24 exhibit?

25 A. That when you look at all of the changes,

1 other than the capacity performance plan, there's
2 four of them. The net of them is approximately zero.
3 You have two that are increasing, two that are
4 decreasing, so net is zero. So all -- most of the
5 increase or almost all of the increase is related to
6 the capacity performance plan. So the key thing here
7 is there are things that have been going on, but the
8 net effect is almost entirely due to the capacity
9 performance plan.

10 Q. And are the issues that are shown in this
11 exhibit considered in your forecast?

12 A. Yes.

13 Q. How?

14 A. In the May forecast of capacity prices, I
15 am -- that -- my model is taking into account the
16 cost of over time, the long run, of new power plant
17 construction. And it's taking into account the
18 supply curve is flattening at the net cost of new
19 construction.

20 So the fact that there's been changes,
21 for example, to the net CONE, I have already
22 incorporated those effects. So, for example, the net
23 CONE is \$300 a megawatt-day in RTO UCAP. In the May
24 forecast it's around \$200 on average per
25 megawatt-day. And it's because the net CONE is

1 reflective of a particular type of power plant. A
2 peaking unit, my net CONE is -- actually, in the
3 model it's an output, and it's -- it's a combined
4 cycled, and we know combined cycle reflects -- almost
5 all the construction is combined cycle.

6 My model is taking into account a good
7 estimate of what the cost is of new entry. CONE is
8 the cost of new entry, and it's a critical part of
9 why over time my supply curve flattened, and when the
10 supply curve flattens, there is a relatively -- it
11 becomes very important in terms of determining the
12 price relative to demand.

13 So my model is also accounting for the
14 fact that small changes -- changes in demand, as long
15 as they are not extremely large, like the great
16 recession, if there's moderate changes in demand,
17 what's happening is they will have some change in the
18 capacity price, but it will tend not to be that
19 significant because your price is being set by the
20 cost of new entrant, which is effectively the supply
21 curve, and that flattening of the supply curve tends
22 to determine the price in the long run, so taking
23 into account properly developments related to net
24 CONE which is affecting the supply and also the
25 demand growth.

1 Q. In your cross-examination today you
2 talked about there being sort of an anomalous period
3 in the short term that would affect the relationship
4 of capacity prices and energy prices so that both of
5 them potentially could rise at the same time.

6 Would there be other factors outside the
7 short term that might also affect the relationship of
8 capacity prices and electric -- and energy prices so
9 that capacity prices would not necessarily go down if
10 energy prices went up?

11 A. All right. There is a circumstances once
12 you move outside an anomalous period where the
13 suppression of capacity prices that was in place is
14 removed and capacity prices rise and energy prices
15 are tending to rise together.

16 Once you get beyond that period of time,
17 you can have other phenomenon that affect the
18 relationship between energy and capacity prices. So,
19 for example, in the long run in my forecast, what's
20 going on is that I have an increasing gas price and
21 increasing CO-2 price.

22 One would assume that the energy earnings
23 of a new power plant, new entrant, would go up over
24 time as the energy and the capacity -- and the CO-2
25 price goes up. They would have more energy earnings.

1 Since they have energy earnings, they need less
2 capacity earnings to meet their rate of return
3 requirement. So that off -- you would expect that to
4 be an offsetting relationship.

5 It turns out, however, that there are
6 other things that are going on, and one of them is
7 there is a large amount of construction of new
8 combined cycles the model is projecting. And it is
9 increasing the amount of competition over time, and
10 it's reducing the margin that the new entrant can
11 earn, so there's offsetting effects in the long run.

12 And so on the one hand you would expect
13 the capacity prices to go down, but the higher
14 competition actually is causing less energy earnings,
15 therefore, the capacity price to go up, and the net
16 of the two is relatively small changes or very little
17 changes in long term.

18 So there's -- you have to take into
19 account both the relationship between the -- we've
20 talked about in general, but also the fact that it's
21 an "all things being equal" relationship, and only as
22 pertaining to the post-anomalous period, which is
23 related to regulatory structure.

24 Q. You were also asked some questions about
25 the analyses that were done in the regulatory impact

1 analyses for the three rules. Do you remember that?

2 A. Yes.

3 Q. And although you indicated that you were
4 not an expert in the benefits part of that analysis,
5 can you describe in very general terms how the
6 benefits analysis and the cost analysis compare in
7 terms of either complexity or level?

8 A. So the documents that I received were
9 calculations and related to the benefits of reduced
10 emissions. And those benefits relate to what is the
11 dispersion and concentration of various different
12 emissions and pollutants in the -- in the atmosphere
13 and how it affects the ambient conditions.

14 There are what's called dose-response
15 relationships that relate changes in exposure levels
16 to various different emissions in average mortality
17 and morbidity, and then there are relationships
18 between the change in mortality and morbidity and
19 changes in the estimated value of that. There is a
20 thing called a statistical value of human life, and
21 these calculations that go from the stack to ambient
22 concentrations, from the ambient concentrations to
23 the dose-response relationship, and then sort of
24 evaluation of the dose response relationship.

25 While there is a certain level of

1 complexity with that, a lot of that is lineal
2 relationships and can be done on a spreadsheet type
3 of model, my part of the analysis relates to
4 assessing what happens when you apply these
5 regulations to the economic and operational
6 characteristics of the power plant fleet and how it
7 interacts with the fuel industries, the transmission
8 grid, and the transportation sectors that support the
9 fuel industries.

10 And it does result in things like costs,
11 capacity factors, new construction, fuel consumption,
12 emissions from individual power plants, and that --
13 that activity is analyzed using IPM-like models or
14 IPM models. The actual one they are using is our
15 proprietary model.

16 That modeling reflects decades of
17 activity, and the modeling is quite sophisticated,
18 and it involves things called linear programming,
19 optimization models, and it's a sophisticated
20 treatment of the grid, and because it's very
21 complicated, it tends to be a single case for --
22 although they may look at different regulations.

23 So it's a different activity. It's
24 modeled differently, involves different parameters,
25 involves different modeling tools, different

1 mathematical techniques, and as I indicated, it has
2 generally one set of economic assumptions in the RIAs
3 and one or more regulatory regimes, and that's
4 different than all of the dose-response and other
5 benefits of the calculations that were in the
6 materials sent to me that don't involve large lineal
7 programming models.

8 Q. I would like to refer you now to IGS
9 Exhibit 15, which is the excerpts from the 2014 AEO.
10 And, in particular, I would like to have you refer to
11 Figure MT-46. I am not sure you have MT-46.

12 MR. KUTIK: May I approach, your Honor?

13 EXAMINER PRICE: You may.

14 Q. Mr. Rose, are you at figure MT-46 on page
15 MT-24?

16 A. Yes.

17 Q. Okay. And that shows some projections or
18 forecasts for LNG for part of the period there?

19 A. Yes.

20 Q. And could you tell us your understanding
21 of what these LNG figures include and exclude?

22 A. So the first thing that these LNG figures
23 from the 2014 AEO say, they don't include the most
24 recent information related to the contracts that are
25 being signed, the facilities that are being under

1 construction, and, in particular, those -- those
2 parameters. It reflects information that was
3 available in early 2014. The 2014 AEO has more
4 up-to-date numbers, and that's the first thing.

5 The second thing is that my understanding
6 of this graphic is that it's for exports from the
7 lower 48. And Figure 7 I am showing exports from
8 North America. Because the tight gas pipeline
9 connections between the United States and Canada, the
10 market functions as a fairly integrated market, quite
11 an integrated market, so the most important thing is
12 what's happening to both the U.S. and Canada.

13 The other aspect of it is it's a net
14 export number, is my understanding, or can be -- it
15 can be a net export number, so it's decreased by
16 imports of LNG. And in our forecast for the United
17 States we do not have major imports of LNG, and I
18 believe that's, in part, because they include in the
19 United States parts of the United States we don't
20 include in our forecast which don't affect the market
21 in Ohio, such as Puerto Rico and Hawaii.

22 And so there's a number of differences
23 both in terms of the vintage of the estimates,
24 whether it's U.S. and Canada and whether it's net or
25 growth, and this number does not have the benefit of

1 the huge amount of construction that's currently
2 ongoing. It wasn't ongoing in 2014, necessarily, in
3 the extremely large amount of contracted LNG export
4 facilities, which is roughly twice the amount that I
5 have in my forecast, in which alone at that level
6 would represent a largest increase in history over
7 something on the order of a 10-year period. The last
8 time we had that, we had shortages of gas in Ohio.

9 Q. You were also asked some questions about
10 resources in China. Would resources in China affect
11 your forecasts for LNG exports?

12 A. It would indirectly affect it, but you
13 have to have sort of a balanced view. As I
14 indicated, two-thirds of our exports, which itself is
15 half the actual signed contracts, go to -- two-thirds
16 of the signed contracts are for Pacific Basin, and
17 the largest importer is Japan. There is some imports
18 that have already been signed for contracts out in
19 western Canada, and it's going to the coastal
20 regions.

21 So what's happening is there are
22 resources available in China for gas, but the demand
23 there is so large on the coastal areas, the
24 infrastructure is so weak in terms of being able to
25 move the gas, the location of the gas in many cases

1 is in populated areas where it's very difficult to
2 get to as opposed to isolated areas. There's no
3 nongovernment sector of experienced, independent
4 producers to go after this. There's issues about
5 protection of intellectual property associated with
6 the shale gas.

7 And so when you look at that, it is
8 something that is a factor, but it is also the cause
9 that there is a market there, and particularly in the
10 coastal region, and you have to have a balanced view.
11 And part of that balance is look at the contracts
12 that already have been signed for some significant
13 sales to China, and, furthermore, our forecast is
14 only half approximately of the signed contracts.

15 And so this is the thing that we are all
16 taking into account. It's not just ICF. It's ICF,
17 EIA, EPA, EVA. All the entities that are looking at
18 this and counting the huge amount of -- just in the
19 LNG sector, not to mention the petrochemical sector,
20 the power sector, and the pipeline exports to Mexico,
21 they are all coming to the same conclusion, which is
22 that the low prices that we are currently
23 experiencing, which can't be sustained because the
24 modeling doesn't show it's sustained in terms of
25 being able to get the gas production, and it's also

1 inconsistent with what is a massive increase in
2 demand, which is accountable and which is foreseeable
3 and which is about to kick in over the next few
4 years.

5 Q. Are there similar challenges with respect
6 to the development of resources in Argentina?

7 A. Yes. So it turns out that there is a lot
8 of political instability in Argentina and a lot of
9 legal uncertainty, and they nationalized the assets
10 of private companies. They renationalized them, let
11 them go. So there's a lot of that type of
12 impediment. There is not a vibrant private sector
13 there.

14 It's also there's almost no activity
15 there. It turns out there was, I think, something on
16 the order of 25, 27 wells. The Marcellus alone has
17 2,500, so that is a lot of problem in Argentina, and
18 that's why we believe that U.S. can have a -- one of
19 the reasons we think the U.S. can have a significant
20 long-term share in the market.

21 But, of course, that's one contributing
22 factor. The main contributing factor is this massive
23 contracted capacity. I think there is a lot of
24 problems in Argentina, and there is very little
25 development going on down there.

1 Q. Are there challenges with respect to the
2 development of resources in Mexico?

3 A. Yes. So as I indicated geologically the
4 Eagleford -- Eagleford, I know that there was some
5 issue about how you spell it. Eagle, animal, and
6 ford extends from Texas down into Mexico, and so one
7 would expect that you would have shale gas production
8 there. There are huge legal issues. There is huge
9 development issues about whether it's the
10 government-owned entity that's going to do it. There
11 is no infrastructure down there. And they want the
12 U.S. gas now. So they are laying the pipes as we
13 speak. They are getting the financing for additional
14 pipes. They even gave the electric company the
15 ability to build its own pipelines just in case the
16 gas companies are moving too slow.

17 So it's very dramatic effort to get gas
18 in there as soon as possible so they don't have to
19 use oil, which is very expensive, and so that's --
20 yeah, there is geology there, but there's more than
21 just geology, and that's a classic example what
22 happens when you have a government entity that's been
23 responsible for many years, and there is just not the
24 infrastructure, et cetera. It's not just geology.

25 Q. Let me refer you to Figure 2 on page 33

1 of your rebuttal testimony.

2 A. Yes, sir.

3 Q. When looking at drilling activity and its
4 effect on natural gas production, would a
5 sophisticated and reasonable analysis conclude only
6 the rigs that are labeled "gas"?

7 A. No. It's the sum of the two that's the
8 most -- most critical factor. And this gets to the
9 fact that when an entity, like Baker Hughes is
10 gathering information, they allow the actual wells --
11 or the actual rigs to identify themselves as oil or
12 gas. And so it turns out that it's not a reliable
13 indicator as to whether the majority of the BTUs or
14 energy is gas or oil. You really need to look at the
15 two together.

16 And when you look at the two together,
17 what you see is in the last year, year and a half,
18 the number going from around 1,900, 2,000 down to
19 800, so it's 55 percent. That's why I'm emphasizing
20 the reduction in the total, in the sum of the two.
21 And what you see there is that's evidence of a major
22 pullback just in the short period of time in the
23 amount of rigs, and there's -- and there's no way in
24 that short period of time you could have
25 technological increase, just 12 months, 16 months.

1 The rate of technological increase is important, is
2 significant and important, but it's not even close to
3 being able to explain a 55, 60 percent decrease in
4 the total the sum of two, which is what you would be
5 looking at.

6 Q. Let me now have you turn to IGS Exhibit
7 14, which was the excerpt of your testimony before
8 the Public Utilities Board of Manitoba.

9 A. Yes, sir.

10 Q. Could you describe what you were talking
11 about in the excerpt there?

12 A. So we had -- we, it was the company had a
13 situation where it was -- it had multiple forecasts
14 of prices for electricity in what's referred to as
15 MISO, which is the area bordering Manitoba, Minnesota
16 area in particular. And they had -- one of the
17 forecasts they had was ICF's, and they had, I
18 believe, three or four other ones, and those
19 forecasts all had sort of reasonable methodological
20 assumptions and approaches.

21 And so the question is would it make
22 sense or was it reasonable to look at an average of
23 those? And in that particular case, it is. It's
24 sort of akin to saying ICF, EPA, EIA, EVA, all of
25 them are having -- doing the modeling in the long

1 term, have significantly higher prices than today.
2 There is a lot of similarities in the price, you
3 know, with the exception of the CO-2 treatment, which
4 reflects a change in the regulations. Averaging
5 those is not an unreasonable thing to do.

6 But you have to have as a basis some
7 treatment of the methodology. It has to be
8 reasonable methodology. If you have a bad
9 methodology, bad approach, you don't want to include
10 that in the average because it will bias the average,
11 and you want to take care of what you know about the
12 forecasts. In this case there wasn't any basic
13 methodological problem, like we have in this case, so
14 it was applicable there, but I don't believe it's
15 applicable here.

16 MR. OLIKER: Your Honor, before you hear
17 your question, I have a motion to strike on his
18 answer which relates to the portion of his response
19 which relied upon hearsay information that wasn't
20 provided to any party or identified, when he was
21 discussing CO-2 pricing as being similar in other
22 forecasts of EVA as well as the EPA and others.

23 EXAMINER PRICE: Mr. Kutik.

24 MR. KUTIK: Your Honor, this is
25 information that comes right out of the EIA AEO and

1 the comparisons as I discussed with Mr. Wilson.

2 EXAMINER PRICE: Isn't it in the AEO?

3 MR. OLIKER: I haven't seen it in the
4 AEO. Maybe, but I don't know.

5 MR. KUTIK: It's in there.

6 EXAMINER PRICE: I have seen it in the
7 AEO. Overruled.

8 Q. You said that averaging, that technique
9 which you talked about might be applicable in the
10 case in front of that Manitoba Board of Utilities,
11 would not be something that should be done here. Why
12 is that?

13 A. Because there's basic methodological
14 problems in some of the forecasts that have been
15 developed. So, for example, in one case, futures are
16 being used, and they are not taking into account the
17 fact that there is very little liquidity, very little
18 information you can -- about future conditions,
19 there's not a lot of ability to go and transact. If
20 you actually move -- go into the market in any major
21 way, you will actually move the market, and so
22 then -- and they are extrapolating off of that as
23 opposed to a supply and demand that would take into
24 account the massive amount of construction of new
25 gas-using equipment that's actually ongoing and would

1 take into account the CO-2 regulations. There is
2 almost no transactions in the CO-2 period.

3 And so you can't rely on the futures in
4 that particular case, and you can't take a
5 nonexpected-value forecast, like a high oil and gas
6 forecast, as opposed to an expected-value forecast.
7 It's just a scenario. It's not an expected-value
8 forecast. So if you are going to be using those --
9 if you are going to be considering averaging, you
10 should -- you've got to start with the premise that
11 it's got a reasonable methodology and starting point.

12 Same thing on capacity prices, shouldn't
13 have a situation in which you're changing energy
14 prices and there's no feedback loop on capacity
15 prices; or you shouldn't have a situation in which
16 you just say it's half CONE and just leave it at
17 that, and there's no modeling. You shouldn't have a
18 situation in which you are recommending increases in
19 the factors that determine price and then you end up
20 lowering the price. So that wasn't the situation we
21 had there, and that would be a situation which would
22 make the averaging inappropriate.

23 MR. KUTIK: That's all I have, your
24 Honor. Thank you.

25 EXAMINER PRICE: Thank you.

1 Mr. Hays, any recross?

2 MR. HAYS: It's going to be very short.

3 - - -

4 RECROSS-EXAMINATION

5 By Mr. Hays:

6 Q. For the short term, as we do find it
7 before the next three years, do you foresee any
8 increase in demand that would exceed the readily
9 available shut-in wells that currently exist?

10 MR. KUTIK: Your Honor, beyond the scope
11 of redirect, so I object.

12 EXAMINER PRICE: Sustained.

13 Q. You indicated there was going to be
14 massive demand increase. How much of this massive
15 demand increase occurs in the next three years?

16 A. Some of it --

17 EXAMINER PRICE: Before you answer that,
18 you are referring to a confidential exhibit. Would
19 you prefer to answer this question on the
20 confidential transcript?

21 THE WITNESS: Yes.

22 EXAMINER PRICE: Okay. We'll defer your
23 question to the confidential transcript.

24 MR. HAYS: I didn't write it down, but I
25 think I can remember it.

1 EXAMINER PRICE: I can, too.

2 MR. HAYS: I had a couple of follow-ups
3 to that. I assume I should wait for that, too.

4 EXAMINER PRICE: Yes.

5 MR. HAYS: Thank you, your Honor.

6 EXAMINER PRICE: OMAEG?

7 MS. GHILONI: No questions, your Honor.

8 EXAMINER PRICE: Mr. Fisk, first, public
9 redirect?

10 MR. FISK: Yes, public, just a couple.

11 - - -

12 REDIRECT EXAMINATION

13 By Mr. Fisk:

14 Q. Mr. Rose, your counsel asked you about
15 the 30 percent approximately decline in NYMEX gas
16 price futures. Do you recall that?

17 A. Yes.

18 Q. Okay.

19 A. Yes, I do.

20 Q. Okay. And I believe your testimony was
21 as it declined in NYMEX gas price futures the overall
22 impact on your -- on the average of your gas price
23 forecast was only about 4 percent; is that right?

24 A. Yes.

25 Q. Okay. And when you say that it's a

1 4 percent impact, on the average, you're saying if
2 you average your full 15 years of your forecast?

3 A. Yes, either 15 or 20 years, in that
4 range. I am talking about long term. It's either 15
5 or 20 years.

6 Q. Okay. So you're not saying it's a
7 4 percent impact just on the 2015, '16, '17 time
8 frame. It's spreading the decline in natural gas
9 price futures over the full length of your forecast,
10 correct?

11 A. I was taking two years of gas futures,
12 not the ones that I used before, but the more recent
13 ones, and factoring into the long-term average, and
14 that's why it's a small effect, in part because it is
15 a long-term average.

16 Q. Okay. And is that -- you also, I
17 believe, offered testimony that the impact on the
18 average of your electric price forecast was 1 or
19 2 percent?

20 A. Yes.

21 Q. Okay. And similarly you are taking the
22 impact of the change in natural gas price futures for
23 the first two years and then figuring out the impact
24 for the full 20 years of your forecast?

25 A. Yes. And so the change in the gas price

1 is also happening in the period of time in which gas
2 is having the least effect on electrical energy
3 prices because prices are primarily still being set
4 in this area by coal, and so it's having a relatively
5 muted effect. So I am changing the price in the
6 period of time in which it has the muted effect, and
7 it's the two years that I use futures in.

8 MR. FISK: Can I have the question and
9 answer read back?

10 EXAMINER PRICE: You may.

11 (Record read.)

12 MR. FISK: Move to strike everything
13 after "yes" as not responsive.

14 EXAMINER PRICE: Granted.

15 Q. And do you recall your counsel asked you
16 a couple of questions regarding net CONE?

17 MR. KUTIK: Well, actually, I didn't ask
18 any questions about net CONE.

19 EXAMINER PRICE: I believe you elicited
20 some response that dealt with net CONE.

21 Q. Fair enough. Do you recall a discussion
22 during your redirect of net CONE?

23 A. Yes.

24 Q. Okay. And in particular there was a
25 discussion regarding potential impact of net CONE

1 changes to net CONE on capacity prices.

2 A. Yes.

3 Q. Okay. And am I correct that net CONE is
4 not an input into your capacity price forecast?

5 A. No. But a figure close to CONE, the cost
6 of new entry, are an input into the -- into the
7 forecast. It is an input into the model.

8 Q. Okay. Am I correct that during the
9 redirect you testified that there was a net CONE
10 figure that came out of the model?

11 A. Yes. So, for example, we were talking a
12 little bit about the cost of a new combined cycle
13 being \$1,000 a kilowatt. That is a critical input
14 into determining what the cost of a new entrant is.
15 Then what's happening is the net CONE is what's left
16 after you have energy earnings from the new power
17 plant. And so it's the net of the costs that have to
18 be recovered in a given year and the energy earnings.
19 And since that's a function of market prices and
20 dispatch, the net part is an output of the model.

21 And so I am inputting cost parameters for
22 new power plants, and the model is calculating a net
23 CONE, one that's the least-cost net CONE, and that's
24 what's driving the long-term supply curve in helping
25 to determine what the price is.

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1 So, for example, we know today that the
2 net CONE is around \$300 a megawatt-day, and my
3 forecast is around \$200 a megawatt-day. That's
4 because the model is forecasting that the least-cost
5 form on net of new entry or new combined cycles, and
6 that's the capacity price that allows them to earn
7 recovery on capital.

8 Q. Okay. PJM establishes a net CONE value,
9 correct?

10 A. Yes. That's the \$300 currently, and its
11 forecast, it will be increasing over the next three
12 years.

13 Q. Okay. And PJM -- is PJM's -- is the net
14 CONE value set by PJM an input into your capacity
15 price model?

16 A. No, the CONE numbers are not the net
17 cones.

18 MR. FISK: Okay. Nothing further.

19 EXAMINER PRICE: Thank you.

20 Mr. Olikar, any recross in the public?

21 MR. OLIKER: I was going to say what are
22 we in, the public?

23 EXAMINER PRICE: We are in the public.

24 MR. OLIKER: Okay.

25 - - -

1 RECROSS-EXAMINATION

2 By Mr. Olikar:

3 Q. Regarding questions you received from
4 Mr. Kutik about LNG exports, first, you would agree
5 that a large portion of the bcf per day demand -- let
6 me rephrase that.

7 The majority of the 21 bcf you identified
8 regarding LNG export is related to facilities that
9 are not yet under construction?

10 A. Yes. The 21 bcfd of signed contracts is
11 larger than the 9 bcfd of current construction.

12 MR. OLIKER: I would move to strike
13 everything, your Honor, after "yes."

14 EXAMINER PRICE: Overruled.

15 Q. And do you agree that in order for an LNG
16 facility to commence construction, there must be
17 something called a final investment decision?

18 A. I am not sure what you mean by "final
19 investment decision." Is that a regulatory
20 requirement or is that colloquial expression of, like
21 I'm finally going to make the money and invest --
22 finally invest the money?

23 Q. Well, are you familiar with the fact that
24 many of the facilities that are not under
25 construction but do have contracts have not received

1 final approvals from their investors to build the
2 facility?

3 A. There can be some of that. That's why
4 our forecast is half the signed contracts.

5 Q. And one of the facilities you identified
6 is the Kitimat facility in Northwestern Canada,
7 correct?

8 A. Yes. That's not one that has a -- to my
9 knowledge, has a signed contract, but there is one in
10 the Prince Rupert area, which is very close by, which
11 I believe has a signed contract.

12 Q. And the Kitimat facility has not received
13 final approval, is that correct, to be constructed?

14 A. I don't remember. What I remember it's
15 not included in my Canadian signed contract estimate.

16 Q. And your source, I believe it's
17 footnote -- just give me one moment -- 53, which
18 identifies facilities that have been approved and are
19 under construction and facilities that are approved
20 and not under construction. You would agree there
21 are only two Canadian facilities identified at that
22 source?

23 A. I would have to check, but I will say
24 that you can see it says "as of May, 2015." And so
25 there's been developments since May, 2015, and the

1 numbers I am giving you are pretty up to date with
2 respect to the total demand.

3 Q. But if I go to that link that you've
4 included in your testimony -- first, when was the
5 last time you checked the link in your testimony
6 under that footnote?

7 A. I don't remember this specific -- I've
8 been checking LNG generally very frequently, but I
9 don't remember when I last looked at this particular
10 source.

11 MR. OLIVER: Your Honor, can we freely
12 cite to the information contained at that link?

13 EXAMINER PRICE: Yes.

14 MR. OLIVER: Thank you. You said more or
15 less administrative notice of that?

16 EXAMINER PRICE: We will take
17 administrative notice of the link of <http://> -- I
18 don't need to cite it. We will take administrative
19 notice of the information contained in the link at
20 Footnote 52.

21 MR. OLIVER: I was referring to 53, your
22 Honor.

23 EXAMINER PRICE: I'm sorry, 53.

24 MR. OLIVER: Thank you very much.

25 EXAMINER PRICE: Are there two links

1 there, Mr. Rose?

2 MR. OLIKER: Your Honor, I was referring
3 to the FERC link, your Honor.

4 EXAMINER PRICE: We will take
5 administrative notice of both, just to be clear.

6 Q. (By Mr. Oliker) And since Mr. Price, your
7 Honor, noted the stratford.com link, isn't it true
8 that that link indicates that much of the CNG that
9 has been approved but not constructed will never be
10 built?

11 MR. KUTIK: May I have the question read,
12 please?

13 EXAMINER PRICE: You may.

14 (Record read.)

15 MR. OLIKER: I think I meant "LNG" if I
16 said "CNG."

17 EXAMINER PRICE: I understand.

18 A. I don't remember. I am not assuming that
19 everything that's been proposed or approved will get
20 built or even all that that's being contracted. I
21 have a very conservative number that never gets above
22 11, though, as indicated, there is a lot more out
23 there that's been contracted for, and there's a lot
24 in addition to that that's been proposed.

25 MR. OLIKER: I would move to strike

1 everything after "I don't remember," your Honor.

2 MR. KUTIK: Your Honor, at this stage of
3 the proceedings, the witness should be allowed to
4 give his answer. There is no opportunity for him to
5 otherwise explain.

6 EXAMINER PRICE: I agree. Denied.

7 Please proceed, Mr. Olikar.

8 MR. OLIKER: Thank you, your Honor.

9 Q. (By Mr. Olikar) And, Mr. Rose, you
10 discussed shale resource development in foreign
11 countries with Mr. Kutik. Do you remember that
12 discussion?

13 A. Yes, sir.

14 Q. And are you making -- you haven't done
15 any analysis to determine what amount of
16 infrastructure may be developed in China that would
17 allow for the transportation of shale gas resources
18 in five or ten years from today?

19 A. No, that's not correct.

20 Q. And you've reviewed the current pipeline
21 infrastructure plans for development in China for
22 over the next five to ten years?

23 A. No. But, as indicated, my colleagues
24 have worked on this issue. For example, there is the
25 American Petroleum Institute's study of World LNG

1 Supply and Demand, and the assessment that the United
2 States would have a 20 percent share, and so we are
3 looking at those factors.

4 As I indicated, there is advantages that
5 the U.S. and Canada have vis-a-vis coastal region in
6 China, and it's a small part of the total amount of
7 LNG that's contracted for, but it's there, and it's a
8 market that is viable for -- in part for the United
9 States and Canada.

10 Q. But you do agree China has undertaken its
11 own initiative to develop its shale gas resources
12 over the next 10 years, correct?

13 A. Yes. But they are starting from an
14 extremely low level. I mean, they are using 4
15 billion tons of coal and very little natural gas.
16 They don't have a natural gas infrastructure. They
17 have pricing mechanisms for government-owned
18 companies that discourage local production of shale
19 gas. Some of the shale gas is in populated areas.
20 They are losing 5,000, you know, miners a year, and
21 so they are having problems with the energy industry
22 there already.

23 And there's -- there is no history of
24 private companies there going after shale gas, no
25 experience, no infrastructure. There is no legal

1 protections. Of all the places you'd be worried
2 about in terms of intellectual property, China would
3 be up there. So there is a lot of impediments to
4 getting gas to China.

5 China is an extremely large energy
6 consumer. It's got a lot of issues, and we do have
7 contracts. We have contracts being signed for North
8 American gas in China, and it is a viable market,
9 particularly in the coastal areas.

10 MR. OLIKER: Your Honor, I would move to
11 strike everything after the very first part of his
12 answer, the part of his answer where he talked about
13 contracts to China, which are completely unrelated to
14 the question.

15 MR. KUTIK: May I have the question read,
16 your Honor?

17 EXAMINER PRICE: You may.

18 (Record read.)

19 MR. KUTIK: Your Honor, he explained in
20 his terms of understanding what's going on in China
21 with respect to those resources and how it affects
22 his forecast.

23 EXAMINER PRICE: I agree. Motion to
24 strike will be denied.

25 I have a follow-up, Mr. Rose. Can you

1 turn to IGS 17? It's Today in Energy. You can use
2 my copy.

3 THE WITNESS: I can find it, I believe.

4 EXAMINER PRICE: No, that's okay.

5 THE WITNESS: There's just a lot of paper
6 here.

7 MR. KUTIK: I think part of the problem,
8 the exhibits aren't marked for him.

9 EXAMINER PRICE: I understand. You can
10 use mine. It you could read the paragraph following
11 the note, for the record. It's highlighted.

12 A. The highlighted section reads, "China's
13 natural gas demand has been growing as the government
14 seeks to move away from coal in favor of cleaner
15 fuels. According to EIA's International Energy
16 Outlook 2013. (IEO2013) Reference case, demand will
17 more than triple from 5 Tcf in 2012 to 17.5 Tcf by
18 2040."

19 EXAMINER PRICE: Thank you. It's time to
20 move or not from Occidental Natural Gas.

21 MR. OLIKER: I have one last question,
22 your Honor.

23 Q. (By Mr. Olikier) Follow-up on some of
24 Mr. Price's question. China sees itself meeting that
25 increased demand through 6.3 tcf of domestic

1 production, correct?

2 A. Did you have a source there?

3 Q. Could you look on the graph? It's the
4 second bar of IGS Exhibit 17.

5 MR. KUTIK: Again, your Honor, this
6 witness has not demonstrated any familiarity with the
7 document, so I object.

8 EXAMINER PRICE: Overruled.

9 THE WITNESS: This is the exhibit, right?

10 MR. KUTIK: Yes.

11 THE WITNESS: Can I have the question
12 repeated?

13 EXAMINER PRICE: You can.

14 MR. OLIKER: Would you like me to repeat
15 it?

16 EXAMINER PRICE: Go ahead.

17 Q. (By Mr. Oliker) And China is forecasted
18 to meet its increased demand through, in part, 6.3
19 tcf of increased domestic production.

20 EXAMINER PRICE: I believe he is asking
21 you to interpret the graph.

22 THE WITNESS: Okay.

23 MR. KUTIK: Your Honor, he's never seen
24 this document before. You are asking him to
25 interpret the graph in the document.

1 EXAMINER PRICE: He can answer if he
2 knows.

3 A. So --

4 EXAMINER PRICE: That's okay, I think I
5 have a better way to summarize it. Instead of
6 interpreting the graph, why don't you read the last
7 sentence of EIA Today in Energy.

8 THE WITNESS: Yes, your Honor. CK "New
9 production along with imports of LNG will meet rising
10 demand in China eastern and southern coastal
11 regions."

12 MR. OLIKER: Thank you, your Honor.
13 I believe that those are all the
14 questions I have.

15 Thank you.

16 THE WITNESS: You're welcome.

17 EXAMINER PRICE: Mr. Sauer?

18 MR. SAUER: I have no questions, your
19 Honor.

20 EXAMINER PRICE: Mr. Kurtz?

21 MR. KURTZ: No questions.

22 EXAMINER PRICE: Mr. McNamee.

23 MR. McNAMEE: No questions.

24 EXAMINER PRICE: Let's move on to the
25 confidential portion of our transcript.

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(CONFIDENTIAL PORTION EXCERPTED.)

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(OPEN RECORD.)

MR. KUTIK: Your Honor, there is some
more business.

EXAMINER PRICE: Exactly. There are
additional things to take care of.

MR. KUTIK: Your Honor, at this time the
companies move for the admission of Company
Exhibit 151, 152 Confidential, and 153.

EXAMINER PRICE: Any objection to the
admission of those exhibits?

Seeing none they will be admitted.

(EXHIBITS ADMITTED INTO EVIDENCE.)

EXAMINER PRICE: Mr. Fisk.

MR. FISK: Sierra Club moves for the
admission of Exhibits 85, 86, 87, and 88.

EXAMINER PRICE: Any objection to
admission of those exhibits?

MR. KUTIK: May I have a minute, your
Honor?

EXAMINER PRICE: You may.

MR. KUTIK: Off the record?

EXAMINER PRICE: Let's go off the record.

(Discussion off the record.)

EXAMINER PRICE: Let's go back on the

1 record.

2 MR. KUTIK: Your Honor, we have no
3 objection to 87 -- 85, 87, and 88. We do have an
4 objection to 86. We don't believe a foundation was
5 laid for the document. Basically it's a document
6 that the witness had seen in his deposition and
7 looked at after his deposition. That's not
8 sufficient foundation, your Honor.

9 EXAMINER PRICE: Mr. Fisk.

10 MR. FISK: Your Honor, I believe, as
11 Mr. Kutik noted, the witness did take a look at the
12 document after his deposition. In addition, I
13 believe the questions I asked him regarding the
14 natural gas price projections he said were
15 generally -- the numbers in this document were
16 generally consistent with his understanding.

17 At a minimum I think the Commission can
18 take administrative notice of this document, given
19 that it's the U.S. EIA. It's a Short-Term Energy
20 Outlook that's released on a monthly basis. It's
21 publicly available and readily reviewable to ensure
22 that it's, you know, an authentic document.

23 MR. KUTIK: Your Honor, it sets a
24 dangerous precedent to show a witness an exhibit in a
25 deposition and then use that -- that review at the

1 deposition as foundation.

2 EXAMINER PRICE: We are not going to
3 admit it on the basis -- on that basis. We are going
4 to admit on the basis we've been admitting EIA
5 documents throughout this proceeding, but we are not
6 admitting it on the basis it was appropriate to show
7 to him in his deposition and then later on say,
8 you've seen this before. So the document will be
9 admitted.

10 MR. FISK: Thank you, your Honor.

11 (EXHIBITS ADMITTED INTO EVIDENCE.)

12 EXAMINER PRICE: At this time we are
13 going to take Administrative notice of ELPC 24, 25,
14 and 26. Subject to if the companies desire to take
15 further administrative notice of other excerpts from
16 those documents, we will entertain that in a motion
17 later.

18 MR. KUTIK: Thank you, your Honor.

19 EXAMINER PRICE: Anyone else?

20 MR. HAYS: We would move for admission of
21 NOAC 1.

22 MR. KUTIK: We object, your Honor. No
23 foundation.

24 MR. HAYS: We've already discussed this,
25 your Honor.

1 EXAMINER PRICE: NOAC 1 will not be
2 admitted. There was no foundation for that document.

3 Mr. Olikier?

4 MR. OLIKER: Your Honor, thank you. IGS
5 would move for the admission of Exhibit 14, 15, 16,
6 17, 18, and 19.

7 MR. KUTIK: Your Honor.

8 EXAMINER PRICE: Just a minute.

9 You are not moving the admission of IGS
10 20C?

11 MR. OLIKER: Oh, and 20 Confidential,
12 thank you, your Honor.

13 EXAMINER PRICE: Mr. Kutik.

14 MR. KUTIK: We have no objection, your
15 Honor, to IGS 14, IGS 19 and IGS 20 Confidential.

16 With respect to IGS 15 --

17 EXAMINER PRICE: One second. At this
18 point we'll go ahead and admit IGS 14, 19, and 20
19 confidential.

20 (EXHIBITS ADMITTED INTO EVIDENCE.)

21 MR. KUTIK: With respect to IGS 15, your
22 Honor, this document has already been admitted. It
23 would be cumulative, and we'd just refer to the
24 entire document as opposed to excerpts.

25 EXAMINER PRICE: IGS 15, Mr. Kutik's

1 right, we don't need to admit that.

2 MR. OLIKER: As long as the record is
3 clear that we are referring to the 2014 EIA, I am
4 fine with that.

5 EXAMINER PRICE: It was. It will not be
6 admitted. Thank you.

7 MR. KUTIK: And with respect to IGS 16
8 and 17, there was no foundation laid that this
9 witness had seen the document, especially with
10 respect to IGS 17, notwithstanding the Bench's
11 encouragement to recite from the document.

12 EXAMINER PRICE: That was not
13 encouragement. It was a question.

14 MR. KUTIK: You said "read this," with
15 respect.

16 EXAMINER PRICE: It was a shortcut
17 question.

18 MR. KUTIK: I understand.

19 EXAMINER PRICE: We have been admitting
20 EIA documents, and I will admit EIA's Energy Today.
21 It was a stretch, but we did refer to it extensively
22 on cross-examination, as well as the shale oil one,
23 so those two will be admitted.

24 (EXHIBITS ADMITTED INTO EVIDENCE.)

25 MR. KUTIK: Exhibit 18, no foundation

1 with respect to the witness hadn't seen it, wasn't
2 familiar with it.

3 MR. OLIKER: Your Honor, the response is
4 the witness discussed the information in the
5 document. He indicated Bentek is one of the
6 companies in the industry that he relies upon for
7 information. He indicated that the information
8 contained in the document was actually consistent
9 with his own understanding of production levels of
10 track wells, and his forecast.

11 MR. KUTIK: Well, your Honor, the only
12 thing he said he could agree to in terms of
13 reasonable -- reasonable or reasonableness was the 19
14 bcfd number. And so the record has already been make
15 on that. There is no need to admit the rest of this
16 document.

17 EXAMINER PRICE: I agree with Mr. Kutik.
18 The document will not be admitted. The witness,
19 there was no proper foundation, and whatever
20 probative is already in the record through his
21 testimony.

22 MR. OLIKER: Thank you.

23 EXAMINER PRICE: Mr. Sauer, are you going
24 to move OCC 33?

25 MR. SAUER: I am not, your Honor.

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1 EXAMINER PRICE: Anything further before
2 we move on to briefs?

3 Okay.

4 MR. OLIKER: Actually, there was one
5 thing that was brought up to me by an intervenor, but
6 it made sense.

7 EXAMINER PRICE: Let's go off the record.

8 (Discussion off the record.)

9 EXAMINER PRICE: Back on the record.

10 At this time the Bench will order that
11 initial briefs be filed on November 30, 2015, and
12 reply briefs be filed December 22, 2015.

13 Thank you, all.

14 35 days later, we are adjourned.

15 (Thereupon, at 7:19 p.m., the hearing was
16 concluded.)

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CERTIFICATE

I do hereby certify that the foregoing is
a true and correct transcript of the proceedings
taken by me in this matter on Thursday, October 29,
2015, and carefully compared with my original
stenographic notes.

Karen Sue Gibson, Registered
Merit Reporter.

(KSG-79592)

- - -

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Case No(s). 14-1297-EL-SSO

Summary: Transcript In the Matter of the application of Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company hearing held on 10/29/15 - Volume XXXV electronically filed by Mr. Ken Spencer on behalf of Armstrong & Okey, Inc. and Gibson, Karen Sue Mrs.