Indianapolis, Indiana
June 19, 2007
9:30 A.M. (EDT)

(Reporter marked documents for identification as Petitioner's Exhibit Nos. 6, 6-Confidential, 25, 25-Confidential, 9, 9-A and 9-B)

JUDGE STORMS: Let's go back on the record.

Will all those witnesses who were not here yesterday please stand and raise your right hand to be sworn.

(OATH DULY ADMINISTERED TO FOUR PEOPLE)

JUDGE STORMS: Petitioner, you may call your next witness.

MS. KARN: Thank you, Your Honor. We call Judah Rose.

JUDGE STORMS: For any of those who were not here yesterday, we've had a bit of a problem with the microphones. You've got to be close. They are going to come in

tonight and adjust the microphones hopefully. We'll see how that works, but it will be quite a bit better once they're adjusted and adjusted properly for the room, but we have one more day to kind of struggle through, so it seemed like yesterday the best approach was just to stay close by the microphone and speak slowly. I don't know if that's related to the microphone or not, but that is suggested by the Court Reporters.

Please proceed.

MS. KARN: Thank you, Your Honor.

JUDAH L. ROSE, a witness appearing on behalf of the Petitioner, having been first duly sworn, testified on Direct and Rebuttal as follows:

DIRECT EXAMINATION,

QUESTIONS BY MS. KARN:

Q Would you please state your name for the record?

A Judah L. Rose.

Q By whom are you employed and in what capacity?

A ICF International is my employer, and I'm a

Managing Director.
Q Do you have before you a document that has been marked for identification purposes as Petitioner's Exhibit No. 6?
A Yes, ma'am.
Q Does that also include Sub-Exhibits JLR-1 through JLR-63?
A Yes, I believe so.
Q Do you also have something that has been marked for identification purposes as Confidential Exhibit 6?
A Yes.
Q And that also constitutes -- does that constitute your confidential version of your case-in-chief testimony including sub-exhibits?
A Yes.
Q Do you have any changes or corrections to make to your case-in-chief testimony at this time?
A No.
Q Do you have in front of you something that has been marked as Petitioner's Exhibit No. 25?
A Yes.
Q And does that include Sub-Exhibits JLR-1 through JLR-10 as well?

A Yes.
Q And there should be one more envelope up there with Petitioner's Confidential Exhibit 25. Do you have that?
A Yes.
Q Does that constitute your prefiled rebuttal -- the confidential version of your prefiled rebuttal testimony in this cause?
A Yes.
Q Do you have any changes or corrections to make to either of the -- to Petitioner's Exhibit 25?
A Yes, on Page 41.
Q This is in the non-confidential version; correct?
A Yes. On Line 21 where it says through JLR-12, it should be through JLR-10.
Q Please make that change for the record and initial in the margin.

If I were to ask you the same questions that are contained in Petitioner's Exhibit 6, 6-Confidential, 25 and 25-Confidential including sub-exhibits today, would your answers be the same?
A Yes.

Q Do you adopt these exhibits as your sworn testimony in this cause?
A Yes.

MS. KARN: Your Honor, Petitioner would offer into evidence Petitioner's Exhibit 6, including Sub-Exhibits JLR-1 through JLR-63, Petitioner's Confidential Exhibit 6, which also includes sub-exhibits, Petitioner's Exhibit 25, including Sub-Exhibits JLR-1 through JLR-10, and Petitioner's Confidential Exhibit 25 including sub-exhibits.

JUDGE STORMS: Any objection?

If not we'll show Petitioner's Exhibit No. 6, Confidential Exhibit No. 6, Petitioner's Exhibit 25 and Confidential Exhibit No. 25 and all attachments thereto admitted into this cause.

(PETITIONER'S EXHIBIT NO. 6, BEING THE PREFILED DIRECT TESTIMONY OF MR. JUDAH L. ROSE, AND PETITIONER'S EXHIBIT NO. 25, BEING THE PREFILED REBUTTAL TESTIMONY OF MR. JUDAH L. ROSE, ADMITTED INTO EVIDENCE.)

(PETITIONER'S EXHIBIT NO. 6-CONFIDENTIAL, BEING THE CONFIDENTIAL VERSION OF THE PREFILED DIRECT TESTIMONY OF MR. JUDAH L. ROSE, AND PETITIONER'S EXHIBIT NO. 25-CONFIDENTIAL, BEING THE CONFIDENTIAL VERSION OF THE PREFILED REBUTTAL TESTIMONY OF MR. JUDAH L. ROSE, ADMITTED INTO EVIDENCE.)

MS. KARN: Thank you, Your Honor. The witness is available for cross-examination.

JUDGE STORMS: Thank you. Mr. Hartley?

MR. HARTLEY: No questions.

JUDGE STORMS: Mr. Polk?

MR. POLK: Thank you, Your Honor.

CROSS-EXAMINATION OF MR. JUDAH L. ROSE,

QUESTIONS BY MR. POLK:

Q Good morning, Mr. Rose.

A Good morning.

Q I trust you had a good night in Indianapolis.

A It's always a pleasure to be in Indianapolis.

Q You're somewhat of a regular visitor on behalf of Duke; is that correct?

A I have had the honor and pleasure of being in Indiana a couple of times.

Q In all of the proceedings that you've been a part of, have you ever submitted testimony giving a recommendation against the siting of a coal-fired power plant?

A No.

Q Have you ever submitted testimony in a legal

proceeding giving a recommendation against the siting of a natural gas-fired power plant?
A No.
Q Okay. Now, as I recall in your rebuttal testimony, you seem to take the position that Mr. Schlissel has testified in favor of IGCC previously. Do you recall making that characterization?
A What I would say is in my testimony, I indicated that Mr. Schlissel and his witnesses that he was testifying with indicated that extra attention should be paid to IGCC on the part of the utilities.
Q And that was Mr. Schlissel's testimony or the testimony of other witnesses?
A Both.
Q Now, there will be folks testifying here today about credit ratings on behalf of Duke, other Duke witnesses. Does that mean your -- at some other proceeding in the future, folks can characterize your testimony as supporting the credit ratings of Duke?
A I'm not testifying on credit ratings today, and what I indicated in my testimony was a specific reference to testimony of Mr.

Schlissel in North Carolina.

MR. POLK: Excuse me a moment.

Q Do you have a copy of Mr. Schlissel's testimony up there?

A No.

MR. POLK: Counsel, do you have a copy of Mr. Schlissel's testimony that Mr. Rose could look through?

MS. KARN: I'll check.

MR. POLK: Never mind. May I approach the witness, Your Honor?

JUDGE STORMS: Yes.

(Reporter marked document for identification as Intervenor's - CAC Exhibit No. CX-5)

Q Mr. Rose, can you identify the document -- well, the document I've handed you is marked for identification as CAC Cross-Examination Exhibit No. 5.

Can you -- and I'll represent to you that this is a selection from a transcript in the North Carolina hearing from January 18, 2007. Is that what it appears to be to you?

A Yes, and I would add the critical word is selection.
Q Were you at that hearing?
A I was at that hearing, yes.
Q Okay. If you could turn to the second page of the document, which is Page 126 of the transcript, and read Lines 17 through 20.
Well, actually -- Okay. The question that was asked of Mr. Schlissel was "So it would be fair to say that you didn't coordinate your testimony with him in any way?", referring to Mr. Cortez and the other witnesses, and what is the response given?
A "That --"
Q "That would be correct."?
A That is Ms. Sommer's response.
Q Right, and they have panel witnesses down there; correct?
A Yes, and, of course, I've already provided you in my interrogatory responses the lines that I was referring to in which he specifically indicated that additional attention to IGCC was warranted on the part of the utility, and that was on Pages, I believe, 194 and 195, and if I could have my interrogatory response, I

could give you my exact quotations.
Q I don't appear to have that one; I appear to have the one where you say Mr. Schlissel co-testified with Mr. Furman. Is that the response you're referring to?
A I'm absolutely 100 percent sure I gave you the citations that I was referring to, the exact page numbers and --
Q You may have; I'm saying I can't find the one you were referring to, but I also have here a copy of the -- of your response where you say he co-testified with Mr. Furman. Did you testify that -- is that your characterization as well that he co-testified with Mr. Furman?
A Yes, and that was also in my testimony, those specific words.
MR. POLK: May I approach the witness, Your Honor?
JUDGE STORMS: Yes, you may.
Q Would this be a copy of Mr. Furman's testimony?
A It appears to be.
Q Do you see Mr. Schlissel's name on there?
A I wouldn't have used the verb co-testified if I was expecting to see Mr. Schlissel's name on

here.
Q So when you say co-testify, can you describe what you mean by co-testify?
A Specifically referring to being sponsored by the same intervenor group, and, in the case of North Carolina, taking very similar positions.
Q All right. So, you are co-sponsored by Duke with their other witnesses; correct?
A Yes, but I didn't testify on IGCC that there should be more of an examination of that.
Q Are you co-testifying with respect to Duke's credit ratings?
A I am, yes, in the sense that I am testifying for Duke as are other witnesses.
Q Okay, so I would be able to ask you questions with respect to credit ratings and Standard & Poor's and how they rate Duke and how they rate IGCC technology?
A You can ask me; I might not answer.
Q And you're co-testifying with respect to sequestration of carbon and the technology used?
A I'm co-testifying in that my testimony -- I'm being sponsored by -- I'm testifying on behalf of Duke.

Q So, are you adopting the testimony of other witnesses here with respect to credit ratings, sequestration, engineering?
A No, and that's why I also referred to his testimony in North Carolina as taking the body of his work, you know, in totality.
Q Now, in ICF's modeling that they did for Duke, did they produce or did you produce or someone for you produce a range of CO2 forecasts?
A In the modeling of -- in this case -- Let me just say this as a complete answer.

With respect to this specific case, I don't remember providing them with our CO2 forecasts. However, they have been a client for many years, and I'm sure they have seen and thoroughly reviewed over many years and many circumstances our CO2 forecasts.
Q Do your CO2 forecasts include a range?
A Yes, and more importantly, they include an expected value as well, which is the critical, pivotal point for the analysis.
Q Now, did you say you have not provided any modeling of CO2 forecasts to Duke for this specific case?
A You know, in the course of this case during

the hours that I billed, you know, associated with this assignment, I'm sure we talked about our CO2 forecasts and the fact that Duke's CO2 forecast is close to our expected case, and I'm sure that we've provided them -- or I strongly believe that we provided them with our allowance study, which is an annual study on the part of the firm that gives our forecasts of CO2, and it's a little bit hazy exactly the extent to which one assignment or one purchase that they had overlaps with this activity.

Q Do you know if Duke did any modeling of CO2 forecasts themselves?

A I don't know, but what I do know is that we have done lots of modeling of CO2 forecasts, and as it turns out, I believe our forecasts influenced those of Duke. Duke, in part, relies on ICF for its forecasts and has in this case for emission allowances.

There's a high degree of similarity between our forecasts, both with respect to the average and the nature of the trajectory and the underlying view that in the end of the time period, you'll end up having

prices being set by CCS, carbon capture and sequestration, and that there will be a balancing of environmental and economic concerns, and that will be evidenced by the legislation that we've proposed.

Q So, would that be a no, they haven't done any modeling?

A Again, I don't know if they have done any modeling. What I know is they've paid us based on the modeling that we've done, so I guess the answer would be: I don't know if they've done their own except for what I heard yesterday from Mr. Stowell, but they are paying us to do modeling.

Q What did Mr. Stowell say?

A Well, he didn't mention a particular computer model that he was using, so I didn't get the impression that he had done any particular computer modeling on CO2 forecasts.

Q Didn't he, in fact, say no, they had not done any modeling?

A I didn't get -- I wasn't 100 percent sure he was speaking for everybody in the firm. He himself didn't look to me like a modeler at all, and I know them when I see them.

Q And that's fine with you that they didn't do any modeling as long as it's consistent with your models?
A Well, first of all, it is not fine if you're not using industry accepted practices to examine. I think it's fine to say I'm going to hire someone else to do it, and particularly I think in the case of ICF, my company, I happen to hold them in high esteem, and I'm very glad the Company has, as you indicated in the preamble to my testimony, worked with us for many years, as has the EPA and many other entities, both public and private, to apply the latest techniques to examine important and tough issues.

MR. POLK: May I approach the witness, Your Honor?

JUDGE STORMS: Yes, you may.

MR. POLK: I'm sorry, Your Honor. I'm just a little disorganized from the weekend.

JUDGE STORMS: Understandable.

Q Now, in an effort to not have to clear the room to discuss confidential testimony, there are some numbers I would like you to take a

look at in your rebuttal testimony on Page 26, and I think if we avoid using the numbers but talk about orders of magnitude and percentage differences, I think we may be able to --

JUDGE STORMS: Just one second. We're going to go and take care of that person out there.

Q Now, the Synapse forecast was $21.5 -- a levelized $21.5 a ton for CO2. The ICF number was less than that; correct?

A Correct.

Q And the Duke forecast was even less than ICF's; correct?

A Yes, it was several dollars a ton lower --

Q Okay.

A -- but as I indicated, it was certainly closer to ICF than was Mr. Schlissel's.

Q As a percentage-wise difference using ICF as the mid-range or as the bogey as it were, ICF's is off -- is lower than Synapse by approximately the same percentage, closely, you know, as Duke's is from ICF's; isn't that correct?

A No. The ICF number is closer to Duke's than it is to the forecast of Mr. Schlissel.

Q But you are perfectly okay with Duke's forecast being, say, several dollars lower per ton without actually doing any modeling?
A Well, let me say this: First of all, I think it's close, and as I indicated, to me, the most important things are the following, which is that I think like ICF in the end, the price is being set by carbon capture and sequestration; that it starts off at a lower level; it didn't start off right away like in 2010 like Mr. Schlissel saw; that it's close and also that it doesn't -- if I take Mr. Schlissel's forecast and compare that to the carbon capture and sequestration costs that we have been using at ICF for IGCC plants indicates that for sure, you should be doing carbon capture and sequestration, and our view is that similar to Mr. Stowell's, and I don't know whether he influenced us or how much we influenced him, but there seems to be this overall agreement that that is not going to be widespread until quite some time in the future.
Q Is that based on an understanding of science?
A I'm not sure what you mean.

Q Okay. We'll come back to that question in a moment.

When were your forecasts prepared?

A The forecasts were part of the ICF annual allowance study which was published at the end of 2006.

Q Okay. So -- and like Mr. Stowell, it's based in large part on your experience of the political process in which you think legislation will have in it?

A I would say this, that it does draw from the 30 to 35 years of experience of ICF working for the Environmental Protection Agency and many if not all of the major players in the debate, so there is some element of what I would call policy assessment, but, you know, I don't want to argue. There's clearly some political dimension to it as well as doing the analysis using state of the art tools to figure out what the impacts are.

So, it's a combination, and it's also looking at the actual proposed legislation, and as discussed in the document here in my testimony, it's pivoting off of the three main streams of legislation that have

been proposed, the Bingaman, the Snowe Feinstein and the McCain Lieberman. Those seem to be the three tripods of the debate and assessing the impacts of each of those type of proposals in combination with what's going on internationally.

Q I think we've already established that you testified on behalf of Duke in North Carolina back in January of this year.

A Yes, that's correct.

Q Was that with respect to an IGCC plant?

A No, it was with respect to the proposed Cliffside ultra super critical pulverized coal plant.

Q How many actual megawatts of coal plants are under construction or very recently completed?

A Something on the order of 11,000 megawatts.

Q And in North Carolina, you testified that capital costs for coal plants increased in general by 40 percent in 2006; is that right?

A Yes. It's hard to pin down, but there have been major cost increases for coal plants and also for all of the major generating pieces of the equipment ranging from wind to coal to gas, geothermal, anything that involves steel,

concrete and specialized equipment.
Q Why would steel and concrete costs be going up in 2006?
A Well, the general understanding of it is that there's been a very large boom in demand for steel, and that boom is associated with demand from places like China and India, and that seems to be the predominant factor that explains the increase.
Q Okay. Is the demand still increasing, or is it decreasing?
A The -- you know, the economy is still growing and so the demand is still increasing. The critical thing is the extent of the increase vis-a-vis the increase in supply, and there are some initial signs that that has begun to taper off, but it is still a very dynamic situation, and while we expect that to taper off and go to inflation levels, it's a dynamic situation.
Q That seems to imply that it's still above inflation levels; is that correct?
A The numbers thus far are above the general inflation rate, which is running, depending on how you measure, somewhere around 2.5 to 3

percent, and there has been some limited evidence that it's topping out, and our view is that it should top out because it's above the cost of producing scale.

Q But those increases have continued to take place over the past several months?

A Yes, some have -- they have continued and have been significant.

Q Now, in North Carolina, it looks like you had done a survey of the costs of pulverized coal plants, and they asked you if you had done a nationwide survey of IGCC plants. Have you done a survey of the cost of IGCC plants, a nationwide survey?

A Well, if you continue reading the testimony, I do make the point that the number of IGCC installations is much more limited than there are of pulverized coal plants.

Q I'm reading here, and it says there is no significant IGCC plant to survey; we're talking about a technology that's never been scaled up before. Does that sound familiar?

A It does sound familiar, and I think, you know, I talked about the fact that we did have estimates of the increased costs of IGCC and

pulverized coal, but that the survey of clean coal technologies like the IGCC wasn't going to be helpful because there weren't that many that were at the scale we were talking about. The Cliffside plant is 850 or so megawatts per unit. There were two units of 1700 megawatts, so there wasn't anything comparable to that.

Q Now, I think they also discussed with you the difference between coal prices, and you seem to indicate that the most important difference is whether the coal is subbituminous or bituminous.

Does that mean that all subbituminous or all bituminous coals are going to be relatively the same in cost and liability?

A No. Coal is one of the most heterogeneous commodities, but it is the case that essentially all of the subbituminous coal in the United States is produced at one location at essentially the lowest prices in the world in the Powder River Basin in Wyoming. Unfortunately, it is in Wyoming as opposed to being in southern Indiana where -- and, therefore, we have very high transportation

costs, and in the bituminous category, there's a range both with respect to mining costs, transportation, depending on where you are, et cetera, et cetera, including sulfur content, so it is very heterogeneous, but there is at the mine mouth, because of the unusual circumstances at the Powder River Basin, some differences that you can point to.

Q Now, would you agree with the testimony yesterday that it's likely that we will see carbon regulations by 2009, 2010?

A Our firm's forecast is that you will notice CO2 prices in the United States on a mandatory basis in 2013, and Duke's is 2015.

The -- sort of the general view that's underlying is that there would be some legislation around 2010, and similar to Mr. Stowell's view expressed in his written testimony that just like with the Clean Air Act Amendments of 1990, it didn't really kick in for five or ten years, we would expect to see a phasing in starting at around 2015, 2020, but that there might be some ability to bank it earlier, so that's sort of our view.

Q Now, when carbon controls come on line, you

indicated in North Carolina that you need to do one of three things. What are those three things, do you recall? I can read them here if you like.

A Yes.

Q Sure. Control CO2 emissions --

A I mean, what I was about to say was that I read it last night, so let me just compare my memory.

Q All right.

A You know, the -- basically what we said is -- or I said was that you either try to reduce at the plant or that you would purchase offsets or allowances, but I don't -- those are the two main categories; they're actions that are available to power plants either to purchase or get allowances, use them or to reduce, and, in fact, it will almost always be a combination of the two.

Q Okay. I think the third item here that you indicate was pay a carbon tax. I'm not sure that's on anybody's high list of likely outcomes.

A No. I can't remember the sequence that led to that. I think the question was something like

related to the carbon tax; there was some earlier questioning on that.

Our view is that it will be the cap and trade program. In fact, I believe all of the bills that have been proposed envision a cap and trade program just like the SO2 and NOx and mercury programs.

Q Now, if I'm reading this transcript right, you said at the time, there's no technology to control CO2 emissions in this industry. Is that still your position?

A There is no utility carbon capture and sequestration currently occurring with the possible exception of a demonstration project in Norway, and that was on a pretty small scale.

There is, as we've discussed at length, proposals and ideas to control -- capture the CO2 and sequester it, and the lack of current applications of this technology is an important contributor to the view that CO2 prices will only reach that level in the distant future, just approximately in the 2025, 2030 range, as opposed to Mr. Schlissel's testimony which is that it will be

on average at a level that would trigger CCS or carbon capture and sequestration.

Q Do you believe that legislation will be enacted that will require the industry to get below 2015 levels of carbon or 2010 levels or not have to get below any level?

A Well, I think -- Let me answer it this way: In 1990, the utility industry was emitting 1.8; in '96, it was 2; today, it's around 2.6, and these are billions of tons. In 2030, the business as usual projection is 4 billion, so there's tremendous increases in the United States in CO2 emissions that are occurring on a business as usual case.

So, our general view is that carbon programs would reduce the increase and would bring us -- sort of takes business as usual but not necessarily getting back to sort of current levels is the scenario that we envision, and what's happening is that there are reductions in other sectors, either purchases or offsets as I've discussed in my testimony, and that's a critical part of the CO2 equation.

Q Now, taking a step back, and I apologize for

having to do this, but I'm sure you'll handle it fine, but we were talking about the significant increase in 2006 of somewhere in the neighborhood of 30 or 40 percent for construction for these plants, but that hasn't been the only increase in the cost of constructing coal plants in the last six years, has it?

A No. There's been -- In my testimony, I do describe, you know -- another hand would be they merge together like you suggest and there would have been sort of two or one large increase, and I think both of them would be -- get us to the same point which would be a very significant increase in cost for coal and other generating technologies and for other things as well.

They just announced that the Alaskan pipeline is going to be delayed because that's expensive, too. So, you know, again, we see wind costs have increased from -- about the same, about 70 or 80 percent, so there have been substantial increases, and I know the Federal Reserve is very worried about inflation as well, and I

think with good reason.
Q You said about a 70 to 80 percent increase; over how many years?
A Some of the technologies, I was thinking in that case wind, say over the last four years, and -- but I would say, in general, we're seeing increases roughly in that range or plus or minus 15, 20 percent over that period of time in the last couple of years, the last four years.
Q But that 70 to 80 percent roughly would apply to traditional coal and IGCC technology as well?
A If you go back to the -- I mean, part of the issue is that you have to go back to the period of time before we were building anything pretty much, so you had cost estimates that we were using, and so the increases sort of involved cost estimates in the 2002 period.
Q So, getting back to the rate of level of increase in carbon emissions, as I recall, you said carbon emissions are increasing, and you don't think that we're going to hit a flat level of emissions, that they'll continue to

increase under the future regulations; they'll just increase at a much slower rate?

A First of all, I'm focusing on the period 2030, which, you know, another 23 years is quite a time period, and focusing in on that time period, it's possible that you could start seeing some stabilization relative to today's or recent levels, but as I indicated, we've already had -- just say in the last ten years, we've had an increase of 30 percent in the last ten years. That means we're growing at about three percent a year in the utility sector, so that gives you a sense of the nature of the problem in the -- and the need to be -- have a balance between economic and environmental concerns.

Q Were NOx, SOx and mercury emissions increasing before those became regulated?

A Yes in the case of SO2 and I believe NOx. SO2 went a little bit -- to just give you a sense, there was an increase up to around 20 million tons. Now we're headed down toward an emission level of 4 or 5 million tons.

Having said that, that's 20 million tons, not 2.6 billion tons, and so

the nature of the problem that we had discussed yesterday -- I didn't feel the point had been adequately made -- is that the nature of the CO2 problem is much more difficult, much more substantial in terms of the magnitude of the tons that we're dealing with and the economic impacts.

Mr. Schlissel's $21.5 a ton on its own as expressed as a tax would increase rates here in Indiana 33 percent for electricity. So, it was never at that level of increase, you know, nationwide or large areas as related to SO2; it was a much smaller problem, not to mention the fact that we've had it since 1970, and the Clean Air Act Amendment didn't really -- the clean air program didn't really push equipment controls until the current regime of CAIR, so I'm saying that we're in 2007, and the first SO2 scrubber went on line in the United States in 1970, so we had 37 years, so it's just a very different problem, particularly when you talk about the use of technological controls for CO2.

Q Is that because the controls are more expensive or because they don't exist or --

A It's directly related to the chemistry that we discussed yesterday, and since I don't frequently get a chance to talk about chemistry, I'm getting a little excited here, but I'll try to simmer down.

You know, when we talked about the C02 lasting 100 years in the atmosphere, it's because it's an extremely unreactive molecule, whereas SO2 is a very reactive molecule, so the basic chemistry that we've been dealing with heretofore has been much more susceptible to technological controls as opposed to CO2, which is a more difficult issue, and the Company's to be commended for positioning itself to try to be in a situation that if it goes to that situation, it will be as well situated as it can be for those type of controls, recognizing that you want to minimize and be as competitive as you can in the face of difficult chemistry.

Q And what happens if the technological controls never materialize?

A Well, I think this is, you know, an issue that Congress and people are going to have to deal with, which is that they're going to have to

make a judgment. We've noted, as I've noted in my testimony, you know, many of the proposed bills, like the seven or so that are currently in Congress, some of them have cost-benefit provisions; you are required to report as to whether or not this is a reasonable, cost-benefit decision, whether or not you should be allocating your CO2 emissions to areas that are being economically affected; you know, there's several provisions. There are caps on the maximum price, so it is already something that people are considering that the cost of the controls may be expensive; we may not be able to get all of the environmental reductions we'd like, everything else being equal, and, therefore, that is an important consideration that manifests itself when we actually run in our model the proposed legislation.

Q Okay. This was the clarifying question that I was thinking of earlier: In North Carolina, you were asked "Let me see if I can ask you one clarifying question about that. So, what you are saying is when you do your modeling, you primarily focus on the political

environment in terms of what kind of carbon dioxide emission controls would be rather than the science?", and your answer was yes. Would that still be your answer?

A Yes. I think to elaborate on the parts that you didn't read, I was asked some questions to which I responded that I was not a climatologist, and I'm still not a climatologist, and what we're looking at is, you know, again, policy and political outcomes which we think are likely.

It is true that as an average citizen and as people involved in policy, we do observe, but I'm not a climatologist, and it does seem that we are headed toward CO2 controls, and I think it's important to have a reasonable view of what that entails recognizing that, as I described, we're facing a new and difficult problem, not necessarily the same as we've dealt with in the past.

Q Now, in North Carolina, you also testified, if I'm reading this correctly, and this is just a part of the sentence, and I'm sure you'll explain the rest of it after I ask you this. You say you strongly believe that actual IGCC

costs have gone up more than for pulverized coal plants. Is that -- was that your view at the time? Is it still your view, and why would that be the case?

A First of all, if you compare the capital costs in my direct testimony to my rebuttal testimony, you'll see that there was a 38 percent increase in the capital costs of IGCC and a 30 percent increase in the cost of pulverized coal relative to my direct testimony, which is consistent with there being a higher cost increase in the absence of incentives, and as to exactly why that is occurring, I'm not 100 percent sure, and -- but it does -- it is an observable phenomenon reflected in our modeling assumptions as described in my testimony.

Q And to do that modeling, you would want to look at a number of different bills pending before Congress, not just one?

A Well, I think it depends on what your objective is. The general approach is to take your expected value and discount it and make your decision on sort of an expected value basis unless you are risk averse, in which

case, then you do want to look at alternative scenarios, or if you believe that there's something wrong with your expected case, you would want to double check, and in that case, you would want to look at alternative scenarios and what you would do, and I think the Company has by looking at what they would do even as CO2 was in a position that you would be wanting to do CCS, carbon capture and sequestration. So, yes, I think you would be wanting to look at different outcomes, but the theoretically correct approach, unless you're risk averse, is to focus on the expected case.

Q And the expected case is highly contingent on politics?

A Yes; that is, the regulation of this industry for both environmental and economic considerations is a very significant factor in the future of the industry, sure.

Q Is Duke proposing a power plant with capture and sequestration?

A What Duke is proposing is a plant that is -- that many people believe is an advantage vis-a-vis carbon capture and sequestration even though it hasn't committed itself to do

carbon capture and sequestration, and as discussed by other witnesses, there is a fairly extensive Duke effort to examine the potential for and continue to examine the potential for carbon capture and sequestration on the scale -- on the order of 15 to 20 percent under certain circumstances, but there's no firm, absolute commitment, as I understand it, to implement carbon capture and sequestration.

Q And is it your position that the way to deal with future carbon regulation is to build another power plant that emits carbon?

A My testimony is that the Company, the Commission, the consumers are facing a growing electricity demand and need new power plants, and in light of their need for new power plants, what's a balance between sort of an economic and sort of environmental considerations.

It's not the case that power plants are built for environmental reasons; it's just one of the, albeit significant, inputs into the decision-making, and as I indicated earlier, our view is that there will

be increases in CO2, but not at the same rate as we would have had in the absence of CO2 regulations. It will still impose very significant costs, as I've already indicated. When we're talking about $20 a ton, that results in, as I indicated, an increase in the rates in Indiana, if that turns out to be the case. As Mr. Schlissel indicates, I don't believe that that's the expected outcome, but even the expected outcome has significant costs.

MR. POLK: I have no further questions, Your Honor.

JUDGE STORMS: Thank you, Mr. Polk.

Ms. Dodd, your witness.

CROSS-EXAMINATION OF MR. JUDAH L. ROSE,

QUESTIONS BY MS. DODD:

Q Good morning, Mr. Rose.

A Good morning.

Q Just to follow up on one of your responses to Mr. Polk's questions, you said that there are 11,000 megawatts of coal plants under construction or recently constructed?

A Yes. That's, you know, from memory, something like -- or maybe it's -- I think maybe in my testimony it was 14. It could vary depending on -- a couple of months ago, it was 11; now I think it's 14,000, something on that order.

Q Is that in the United States, or is that --

A That's in the United States, yes.

Q And you do discuss that increased demand for construction of coal plants in both the United States and internationally. Are all of those pulverized coal plants that are being built?

A I can't say all; I don't have a complete count. I would say most of them are pulverized coal plants.

Q Okay. What would the others be?

A Well, since the 1930s, the dominant technology has been pulverized coal, so I would say that

a great majority are pulverized coal if they're not IGCC or gasification projects. I know that some have been proposed for sure, and it's -- but the majority are pulverized coal.

Q Turn to your rebuttal testimony, Page 13, Lines 14 and 15, and you state that the majority of U.S. CO2 emissions are from non-utility sources. What are those sources?

A The most important source is motor vehicles, and there are also industrial sources and homes.

There was a lot of CO2 -- SO2 was -- if you sort of looked at the large -- almost all of the SO2 in the United States say in 1970 was coming from utility power plants and some large industrial facilities. It's a different problem with CO2 and cuts across a lot of different sectors.

Of course, you know, we're all emitting CO2 as we sit here. The general view is that we ignore that and focus in on the reliance of fossil fuels, the direct use of fossil fuels.

Q In your opinion, will any CO2 legislation

address these other non-utility sources?
A Yes.
Q So, it will impact the auto industry and other industries in the United States?
A I guess what I would say is the following: We look at many sectors. I right now don't have a knowledgeable assumption about the mobile source sector. What I've been focusing on is the fact that there are many sectors are that are involved, and I do discuss in my testimony and in my interrogatory responses that there's something on the order of two to three billion tons, which is equal to U.S. emissions, likely to be available, and offsets would be going to clean it up and the CDM program, and a lot of -- a substantial portion of that's coming from non-utility sources.
Q Now, Page 22 of your rebuttal testimony, Lines 22 and 23, you reference AEP conducting tests on two plants. Are those traditional coal plants, or are those IGCC plants?
A The way it actually reads is two capture options. It's really, I think, in regard to one pulverized coal plant in Oklahoma, but that's my recollection of it.

Q Is that a new plant or an existing plant?
A It's an existing plant.
Q Is that a utility plant or an industry plant?
A It is a utility plant owned by Public Service of Oklahoma, which is an operating subsidiary of American Electric Power.
Q Do you know what the size of that plant is?
A It's several hundred megawatts; 400 or 500 megawatts roughly is my recollection.
Q Mr. Rose, do you consider new super critical pulverized coal plants as clean coal technology?
A The designation of clean coal technology is something that is, in my understanding or the way I use the term, something that's declared as such by the federal government, and, yes, super critical pulverized coal technology in addition to integrated gasification combined cycle technology are the two principal technologies that I think of in terms of new generation technologies and so designated by the Department of Energy, and interesting to note, this Company's pursuing both, and both have, you know, significant pros and cons in terms of their possible future utility, if you

will.

MS. DODD: No further questions.

JUDGE STORMS: Mr. Mohler, your witness.

CROSS-EXAMINATION OF MR. JUDAH L. ROSE,
QUESTIONS BY MR. MOHLER:

Q Good morning, Mr. Rose. Nice to see you.
A Very nice to see you, too.
Q If you could turn to Page 20 of your testimony, please. Lines 6 and 7 where it says "Also, nearly all coal is used in electric generation.", could you just clarify what that means?
A I'm sorry, are you talking about my direct?
Q Your direct, I'm sorry.
A Page 20?
Q Yes, Lines 6 and 7.
A I see that, and the question is?
Q Could you explain what that exactly means?
A Well, both Indiana but also in the United States, I'd say something on the order of 90 percent of coal is used for electric generation.

Q And if you could turn to Page 43 of your direct at the bottom of the page, and it says "The calculation was based on the local and Indiana State tax incentives provided by DEI." regarding the 210,000 KW IGCC incentive. Do you see that?
A The $210 a kilowatt?
Q Yes. I'm glad to see that you have a calculator because my phone was turned off so I couldn't do the math.

Could you tell me what the total tax incentives for the Indiana state and local were to get to that $210?
A No, I can't. First of all, the number was superseded in my rebuttal by a -- I think it's a higher number. I think it's on the order of $230 a kilowatt. It's public and in part of my testimony. It was provided to me by Duke Indiana, and I don't -- and the current number has both federal, state and local, and I don't have the breakout of the current number or the previous number.
Q Are you familiar with Ms. Pashos' testimony in this proceeding?
A Yes, to a certain degree.

Q Would you agree, subject to check, that Ms. Pashos testifies that the total estimated state and local incentives based on the project cost are approximately $310 million?
A That is a very large number relative to the ones we're talking about, and actually I can't respond except that to raise the question as to whether that's a present value or total. The numbers that I use in my testimony are present value and, therefore, necessarily lower than the gross amounts, and many of the tax benefits are something that accrue over time as you pay taxes.
Q Do you know what the federal incentives are for this project?
A I know that they're being -- I understand they're being provided by the Department of Energy, and, again, it's one of two projects in the United States so designated in terms of Duke power plant projects, this one and the Cliffside plant that we talked about earlier also being pursued by Duke, but the exact details, I can't speak to, no.
Q Does $133.5 million sound familiar at all --
A No.

Q -- as federal incentives?
A I'm sorry, I can't break out the sub-components. I'm not sure. Sorry, Diane, but I think that's yours, but they were provided to me by Duke Indiana on a present value basis.
Q Thank you. If you would turn to Page 7 of your rebuttal testimony, please. Regarding the steel costs and the dramatic increase over the last 12 to 18 months, do you see that testimony?
A Is there a specific reference on Page 7?
Q Page 7, Lines 16 through 20.
A Yes, I see that.
Q Would you agree with me that steel costs are based upon all costs of production generally?
A I guess what I would say is that in equilibrium, I would expect the production cost of steel to -- the marginal cost of producing steel to set the price, but there are periods of time in which you have scarcity value or you have prices below sort of the long-run marginal cost, and I think pursuant to the conversation we had yesterday or earlier was I do expect that the steel costs

will move towards an equilibrium level. That's why our forecast shows only an increase in inflation, and I think the Company is being a little bit conservative by building in a 4 percent growth rate rather than an inflation growth rate, and we think that will go down further out over time as described in my testimony.

So, I do think that production costs are important; they are related to the price, but not all the time, and it's the reason why we think the current steel prices are on a sustainable high.

Q Would you agree with me that energy costs are a significant component of steel costs?

A Yes, they are. I mean, it depends on how you're producing the steel; sometimes it's electricity, and sometimes it's heat, but it is a significant component, yes.

Q So higher energy costs could lead to higher steel costs potentially?

A Yes, but I think there are other things that are going on as well. It's certainly true that higher energy costs lead to higher steel production costs.

Q Thank you.

MR. MOHLER: No further questions.

JUDGE STORMS: Thank you. OUCC, your witness.

MR. ENDRIS: Thank you, Your Honor.

CROSS-EXAMINATION OF MR. JUDAH L. ROSE,
QUESTIONS BY MR. ENDRIS:

Q Good morning, Mr. Rose.

A Good morning.

Q On Page 3 of your testimony, you mention some of your Indiana experience, and you say finally, in 2004, you testified in 42469, a CPCN case. You've been here more recently than that, haven't you, about 11 days ago testifying as an expert on hedging of the power markets; is that correct?

A Yes.

Q Do you have any advice for us on how we can hedge our way out of the rate increase for this IGCC plant?

A Well, as we discussed 11 days ago, the purpose of hedging is to sort of smooth out the ups and downs, and I haven't really focused in on

the rate impacts.

I did notice that the Company was declining to request a full 300 basis points; that seems like something that was designed to smooth it out, but, again, I haven't focused in on the rate effects of the particular project.

Q Are these CPCNs that you've testified here previously, you've provided price forecasts in those proceedings, also; is that correct?

A Yes.

Q And those price forecasts were used by the Company to support its requests for adding new capacity; is that correct?

A Yes.

Q And speaking of 42469 in particular, do you recall the OUCC's position in that proceeding regarding our price forecasts?

A No.

Q Would it help to refresh your recollection if I state that the OUCC was somewhat critical of your forecast of rapidly increasing wholesale peak prices?

A It does to a certain degree. Yes, I do remember a comment and testimony that was

going on, but I have a vague recollection of that.

Q Would that be for on-peak summer month prices in Cinergy?

A It might have. What was the -- because I don't follow the numbers carefully, the 42469, what was the subject matter in that?

Q That was for an as yet unspecified generating facility.

A Yes, that was my thought. It makes sense that it would focus in on peak prices during the summer among others.

Q In fact, you also testified in Cause No. 42145, the transfer of the Madison, Ohio and Henry County facilities. Do you recall that?

A Yes.

Q And as I checked the record, you also forecasted a very sharp increase in summer peak prices in that proceeding as well. Do you recall that?

A Yes. I did forecast an increase in capacity prices, in particular, which are the component of prices that are most relevant for peaking gas units, and I have testified on behalf of gas plants, and I do think they're a useful

part of a balanced portfolio.
Q Did those forecasted prices materialize?
A I would say the following, which is that the recovery in the capacity component of the prices has been slower than I expected, and -- but at the same time, we have seen significant increases in capacity prices in New England, eastern PJM and California, and I believe that they'll -- we will still see significant increases in capacity prices because the amount of construction is lagging relative to the demand.
Q And those other markets that you mentioned, are those in largely deregulated states?
A They are largely in deregulated states, but at the same time, the phenomenon of -- that goes on in PJM is going to affect Indiana for sure since Indiana is now part of PJM, and it's true that there's not detailed deregulation here in Indiana, but all of Indiana's either part of PJM or MISO as of -- after the Day 2 markets, as of April 1, 2005.
Q Can you turn to Page 19 of your direct testimony, please? Lines 18 and 19, there you say "These annual capacity related costs are

recovered during the summer peak periods via price spikes or in capacity markets." Do you agree that we do not have capacity markets in Indiana?

A Yes. You don't have the capacity markets of the type that I'm referring to similar to PJM, as we were discussing or -- but -- and, therefore, you would expect to see price spikes in this market.

Q What kind of price spikes have you reflected in your forecast? In your testimony, you provided the annual numbers, but what kind of summer period, peak period, price spikes are reflected there?

A Well, without getting into the confidential numbers, we do show the market having substantial capacity prices out over time, and the great majority of that, we've indicated to Duke, would occur during the summer, and that's based on the fact that scarcity occurs in the power industry in the summer. The rest of the year, you tend to have excess capacity, and that's related to the fact that everyone's air conditioner is on, and it's at the peak period, so the system is most desirous of

having megawatts of capacity.
Q So, to the extent that your forecast reflects somewhat stable -- Well, let me strike that.
What do your forecasted prices for the reference case show with respect to wholesale power prices? A slight increase, decrease, roughly the same?
A Are you referring to a specific price?
Q Let's use the Into-Cinergy.
A I have the numbers right in front of me in my confidential testimony, so I'm not sure --
Q And I'm trying to stay away from the actual numbers as well.
A I'm sorry, the question is?
Q From today's prices, generally, are you forecasting prices to increase, decrease or roughly stay the same?
A I would sort of say roughly stay the same would be the forecast, and I have in front of me the 2007 to 2026 long-term average. It is an all-hours price, and it's firm. What would be going up would be the increase in the price spike component over time.
Q Does that mean that the other non-peak periods must be declining?

A There's some decline, I believe, in coal prices that is forecast, so that has some effect on the -- moderating the effect of the price spikes, but to give you a sense, the price spike component is only around 13 percent of the all-hours price, so that if you thought it was really important and wanted to minimize it, particularly if you happen to be short, it could be quite an unpleasant experience, particularly if it's above equilibrium prices, but you could have a fairly significant increase and then have roughly modest decreases, and I would sort of say that the price here is a little bit above but not much above the average prices that have occurred in the last two or three years.

Q For the peak period component or for the all in?

A For the all-in, firm, all-hours, 24 by seven product, and that's heavily influenced by our natural gas price forecast.

Q And trying to speak generally, what do you expect to happen on the summer peak period prices? I think I heard you say earlier that you expect some price spikes; is that above

the existing levels that we see in the current market?

A Yes. The forecast envisions a rolling shortage of capacity rolling in from the coasts towards the center of the country, and in the midwest, rolling in here around '09, '10, and we've already seen that on the coast going from essentially zero capacity prices to very significant ones.

Just on April 13, as I prefaced in my rebuttal testimony, we saw the prices in the eastern PJM area go from essentially zero to around $70 a kilowatt, which is actually in excess of our forecast at the time, although we were expecting to get there in '08, '09.

Q Didn't they just recently change how they -- their market for the capacity market?

A Yes, it went from a -- in my mind a disfunctional system to one that was fixed.

Q Which could account for some of that movement from zero to $70?

A Yes, that is -- what was happening is that they were basically averaging out a situation, which is, as I indicated, more extreme on the coasts but is sort of moving to some of these

central sections over time.

Q Can you turn to Page 22 of your direct, please, Lines 15 and 16? Can you describe how the price projections are utilized in the Duke Indiana STRATEGIST model? Does it use the all-in prices that you're reflecting in your testimony, or is there some other formulation of that?

A You know, I mean, the sentence reads "As described by Ms. Diane Jenner. . .", and I think that's really a question best directed to her.

What I can say is that we do give her hourly prices and take into account seasonal variation as well as the fact that we believe that the capacity component was reflected in the summer.

As to exactly the disaggregation in the model, that's something Diane would have to answer.

Q Thank you. You answered a question I should have asked.

A Okay.

Q I asked an imprecise question, and you gave me a more precise answer. I appreciate that.

A My pleasure.
Q Can you turn to Page 31 of your testimony, please? I'm looking at Lines 20 and 21 where you forecast a supply response over time to higher prices including greater North American supply.

Can you describe or explain where that greater North American supply would come from?

A In the modeling that we're doing in the gas sector, which is sort of parallel and related to what we're doing in a power sector, it's coming from a number of sources.

The -- so, for example, one of the sources that's in my direct is Alaska, and unfortunately there was an announcement that they're not going to be going forward, at least in the same timetable, with the Alaskan pipeline, and as you know and as indicated in my testimony, we did increase our gas prices between the direct and the rebuttal testimony, and it's partly because of factors like that that caused us to redo our gas price forecast.

The main reason they're going from a lot of different settings and the things

most common about them is that they're fairly expensive settings, expensive geologic settings, so they seem to be coming from what they call, you know, low porosity formations, a classic example being the front -- the Rockies area, deep off shore, et cetera, and some more exotic locations like Alaska, so that's proved to be problematic, and as I note in my testimony, there is still a significant gap between the current prices and our forecasts, so -- and we have done a number of sensitivity cases with the Company over the course of this case.

Q Is the problem with the Alaskan supply the only one that you've identified thus far?

A No, no. That's one that I think is just easiest to grasp because the other ones just tend to be a general increase in supply costs or supply curves, and that's just easiest as a representative of some of the trends that we're seeing in the gas sector.

Q Can you turn to Page 32 of your direct, and on Line 17, you're discussing coal prices for the Duke Indiana IRP, and you state on Line 19 that "Prices for Illinois Basin coal are the

most important coal prices."

Are you familiar with or aware of a project for a synthetic gas facility that is also proposed for southwestern Indiana?

A No.

Q Did you consider in your modeling the possibility or the impact on prices for Illinois Basin coal, particularly such coal mined in Indiana, if those prices should increase?

A Yes, in the sense that the modeling we did had a network, a transportation network, of something on the order of 45 supply regions, so that if there were to be a significant increase in coal prices at one location, either via greater demand or supply problem, the modeling would automatically adjust, and the appropriate coal price would reflect new delivery options.

So, for example, the Illinois Basin has got three parts, the west Kentucky part, the southwest Indiana and the Illinois sections, and, of course, there is the Powder River Basin coal, which we mentioned, so there's a lot that has to happen in a

situation in which coal prices are $1.35 an MMBtu, and current gas prices are about $9.00 a million BTU, you know, for there to be a really large movement, and if there is movement in one locale, it's likely to be -- to give rise to compensatory activities on the part of the purchasing requirement of Duke, and it's one of the advantages of, you know, getting transportation options that are flexible.

Q So, if southwest Indiana mined coal should increase in price, your model assumes they'll procure it elsewhere?

A The model will act on economics, and there are -- there is related pull from other locations, and there are costs as well; that is, you know, it's not easy to jump on Powder River Basin coal, but, again, there are a number of other sources. There's Appalachian sources, and so there are a number of sources that Powder River Basin coal might require, upgrades or derates, so it would be a balancing of all of the different economic factors affecting the operation of the plants.

Q On Page 42 of your direct testimony, you

discuss some additional scenarios that you analyzed in addition to the reference case, and it doesn't appear that any of them -- that that did not include higher coal costs. Is that -- Well, can you tell me why that is?

A Well, every single run that we do involves different coal prices, right, so if there's a coal supply curve of 45 regions, there's maybe something on the order of ten to 15 coals per region with different sulfur contents and different mercury contents, and so the coal prices are varying.

It's just that as you look at, as I indicate, the number -- the most important uncertainties facing the Company and consumers of Indiana are -- and something that does lead to sort of, you know, the need to sort of consider different alternatives is, you know, gas prices and issues on environmental regulations, and we have been doing sensitivity cases, and I don't know, you know, exactly what role we've played in that, but, you know, they have looked at an option that does have the optionality or the flexibility to respond to a tighter than expected CO2

program with carbon capture and sequestration.

So, again, I think it's -- we have been working with the Company on alternative scenarios, and their basic plan seems to be geared around being flexible with respect to the uncertainty.

Q Can you turn to Page 49 of your testimony, please?

JUDGE STORMS: Mr. Endris, let me stop you right there. We need to go off the record for a moment.

Let's go ahead take a ten-minute break.

(HEARING IN RECESS UNTIL 11:20 A.M., SAME DAY)

Indianapolis, Indiana
June 19, 2007
11:20 A.M. (EDT)

JUDGE STORMS: Let's go ahead and get started and go back on the record.

Mr. Endris, you may proceed with your questions.

MR. ENDRIS: Thank you, Your Honor.

CROSS-EXAMINATION OF MR. JUDAH L. ROSE,
(Continuing)
QUESTIONS BY MR. ENDRIS: (Continuing)

Q Mr. Rose, I'd like to follow up on something that I think I heard you state to Mr. Polk, but I'm not sure if I heard it correctly.

He was asking you about the modeling of IGCC plants, and my question is: When you're putting in the capital costs for IGCCs into your expansion model, does that include the costs associated with carbon capture and sequestration, or does it exclude those costs?

A The -- we do it both ways. As a general matter, the most frequent use is without the

costs of the carbon capture and sequestration, but we do also run the model with carbon capture and sequestration options when we're trying to forecast the CO2 price.

As I indicated earlier, at the 21, it turns out almost exactly. Our numbers we were using for IGCC turn out $22 a ton; I think that's in 2003 dollars, as the cost for carbon capture and sequestration over an IGCC plant, so Mr. Schlissel's forecast would indicate that we have a sure thing on average where we see it coming out at the end of the horizon, and we have a higher cost for super critical pulverized coal plants, so we do run it both ways. In the testimony here when we ran the Edwardsport plant, we did not include those costs.

Q Okay. For the plant that comes into the Cinergy region, did you not include those?

A That plant, the Edwardsport plant -- the characterization of the Edwardsport plant and the modeling that we did to provide inputs to Diane Jenner's analysis or the Company's analysis did not include the cost of carbon capture and sequestration, just the other

costs.

Q Can you turn to your rebuttal testimony, please, and on Line 7, you were discussing with Mr. Mohler towards bottom of the page the increases in steel costs --

JUDGE STORMS: What page are you on?

MR. ENDRIS: I'm sorry, Page 7.

Q At the bottom of Page 7, you were having that discussion, but you also state on Line 21 that labor costs, especially for specialists in plant construction, also appear to have escalated. Do you have a sense for how much they have escalated?

A I don't have a quantitative measure. The preceding sentences show some measures of steel costs and cement costs.

Part of it is -- parts of it also separate out in that sometimes in the equipment manufacturing, getting slots for the equipment manufacturing, using a combination of labor and those pieces of equipment, that seems to be -- have contributed to the increase, so I don't have a quantitative estimate on that, and for generalized trends,

I did notice Mr. Roebel's testimony, I believe it was, related to southern Indiana labor, but I haven't looked at that particular category directly or recently. We have a general means index for Indiana, but I haven't been tracking the changes in that recently. I've just been looking at general, nationwide trends.

Q So, you don't have a sense of whether it's on the order of magnitude of doubling or tripling?

A No, I don't have any quantitative estimate on the labor.

Q Can you turn to Page 15 of your rebuttal testimony, please, and just to be clear in our discussion earlier regarding the modeling, assuming that natural gas supply would increase in response to the price increases, on Lines 14 and 15 at Page 15, you state "This natural gas price increase is expected to be substantial and must be accounted for. . ." Does your model assume increases in supply in response to this price increase as well?

A Yes. The modeling is with a gas supply curve, which is drawn from a larger supply and demand characterization of North America, and so the

modeling of the gas prices are being done as the coal prices, as the allowance prices, et cetera, are all being done simultaneously for the entire North American marketplace, and as I indicate here, the most important thing to do is to make sure that your analysis is integrated so you are able to take into account all of the various factors that are affecting the economics of the, in this particular case, coal.

Q And turning to Page 40 of your rebuttal testimony where you have been talking about the demand growth for electricity, on Lines 10 and 11, after discussing the Midwest ISO peak electricity demand growth, you say ". . .this reflects in part weather conditions. . ." Does that mean that those numbers are not weather normalized?

A Yes, that's correct. They are not weather normalized, and -- but in terms of the demand growth, when you include that data, it reinforces the general view that U.S. electricity demand is part of the general set of data which shows very strong demand growth in the last couple of years, and that there

will be an underlying trend of electricity demand growth in the United States. Around '24, '25, it is extremely stable, and this is reinforcing -- this set of data is part of the set of data that reinforces that.

Q And finally on Line 41 of -- I'm sorry, Page 41 of your rebuttal, Line 16, in that paragraph, you're talking about the footprint in acreage for wind generation, and I notice in your footnote, your citation is from a study that was published in 1994. Do you know -- is there -- are there more recent updates to the number of acres per megawatt of wind that would reflect the new technologies?

A There is a range that I'm showing, and I believe the American Wind Energy Association document is up to date; it's on their web site currently, and I show a range, and I believe that the lower end of the range is coming from that particular source, the American Wind Energy Association.

Q Okay.

MR. ENDRIS: Nothing further, Your Honor.

JUDGE STORMS: Redirect for this

witness?

MS. KARN: Yes, thank you, Your Honor.

REDIRECT EXAMINATION OF MR. JUDAH L. ROSE,
QUESTIONS BY MS. KARN:

Q Do you recall when you were speaking with Mr. Polk about testimony that Mr. Schlissel made in the North Carolina Cliffside proceeding?

A Yes.

Q And in that exchange, you referred to another part of the transcript which was included with a data response that you recently provided to the parties wherein your words, I think, you said Mr. Schlissel did say that IGCC should be looked into further by the Company.

A Yes, the Company hadn't adequately considered IGCC.

MS. KARN: Your Honor, may I approach?

JUDGE STORMS: Yes, you may.

Q If you would take a look at that --

MS. KARN: And I'll explain for the record that I only have the one copy of this at this point, but if the Commission

desires, I can make additional copies and introduce this into the record, but this is a section of the transcript from the Cliffside case in North Carolina in Docket No. E-7, Sub 790, Volume 3, and it's several different pages from that.

Q (Ms. Karn Continuing) Is that correct?

A Yes, that's the -- this is what I was referring to.

Q I think I will have you go ahead and read certain portions of those for the record. Could you start on the first page, which is at the top of the page, Page 124, and start reading the question there at Line 7 and the answer through Line 22.

A Line 17?

Q Line 17, yes.

A Question, "Do you advocate the development of IGCC in North Carolina, particular (sic) for Duke to meet its needs in 2011?"

Mr. Schlissel: "We think it should be examined in detail but we're not coming in here and say build it, a specific IGCC plant, in place of Cliffside."

Q Thank you, and can you turn now to the next

page, which I will represent is Page 193 from that same transcript.

Can you start reading that page starting at the question that begins on Line 8 through the answer that ends on Line 22?

A "And then with regard to IGCC, is it your opinion that Duke should have run that type of capacity addition through the CEM methodology and also in their PaR analysis, or do you agree with Ms. Hager that it was appropriate to eliminate IGCC as a potential technology at the busbar screening curve analysis stage."

Answer: "No, we disagree with Ms. Hager. Given the potential for IGCC, we think it's important to follow it through the analysis. It may not turn out to be the most economic option, but certainly given the potential for the technology to significantly reduce or eliminate CO2 emissions from coal, that it should have been studied in greater detail and not eliminated at the outset."

Q And finally a small portion on the next page, which is Page 194, if you would read beginning with the question that starts at Line 6 and the answers that go all the way to Line 17

there?

A "Is it your opinion that IGCC would serve as a good hedge against natural gas prices?"

"Sure, if you were confident that the technology worked and would be reliable. By using coal instead of natural gas it would be a hedge against natural gas prices."

"Would IGCC be a better hedge than supercritical pulverized coal against some sort of CO2 emission tax?"

"Again, assuming the technology -- you're confident the technology is going to be reliable and work. Yes, certainly."

Q And just to clarify, the answers in that entire section, were those all from Mr. Schlissel?

A Yes.

Q And were these the portions of the transcript that you were referring to in your testimony when you were referring to Mr. Schlissel recommending continued investigation of IGCC?

A Yes, ma'am.

MS. KARN: With that, Your Honor, I have nothing further, unless the Court or the parties would like copies of that which I

could bring back after lunch.

JUDGE STORMS: Do you intend to offer that as an exhibit, or just -- are you satisfied with --

MS. KARN: I guess I should offer it as an exhibit if I can bring back copies after lunch.

JUDGE STORMS: That would be fine. Would the parties like an opportunity to take a look at it, or has everyone seen it except for us?

MS. KARN: It was attached to a discovery response, CAC 12.24. However, the attachments were on CD, so --

JUDGE STORMS: Is there going to be an objection to the admissibility of the document?

MR. POLK: Subject to verifying that it was, in fact, on the CD that was provided, and we have had some difficulty in getting the right CDs and right files, so I wouldn't have an objection if it has actually been provided to us.

JUDGE STORMS: Let's go ahead and get some copies to the parties, and we'll make

sure that we go ahead and address this after lunch.

MS. KARN: Thank you, Your Honor. That's all I have.

JUDGE STORMS: Thank you.

Mr. Rose, thank you very much for your testimony. You are excused.

(WITNESS JUDAH L. ROSE EXCUSED ON DIRECT AND REBUTTAL)

JUDGE STORMS: Petitioner, you may call your next witness.

MR. DuMOND: Thank you. We call Ronald Snead.

RONALD C. SNEAD, a witness appearing on behalf of the Petitioner, having been first duly sworn, testified as follows:

DIRECT EXAMINATION,

QUESTIONS BY MR. DuMOND:

Q Please state your name for the record.

A Ronald C. Snead.

Q By whom are you employed and in what capacity?

A I'm employed by Duke Energy Shared Services as Vice President, Asset Management.

Q Do you have a document before you that has been marked as Petitioner's Exhibit 9?

A Yes.

Q Is that a copy of your prefiled direct testimony in this cause?

A Yes.

Q Do you have any changes or corrections to your testimony?

A No.
Q If I were to ask you the same questions that are set forth in that testimony, would your answers be the same?
A Yes.
Q Do you adopt Petitioner's Exhibit 9 as your sworn testimony in this cause?
A Yes.

MR. DuMOND: Your Honor, Petitioner offers into evidence Petitioner's Exhibit 9 including Sub-Exhibits 9-A and 9-B.

JUDGE STORMS: Is there any objection?

If not, we'll show Petitioner's Exhibit 9 with Sub-Exhibits 9-A and 9-B admitted into this cause.

(PETITIONER'S EXHIBIT NO. 9, BEING THE PREFILED DIRECT TESTIMONY OF MR. RONALD C. SNEAD, WITH PETITIONER'S EXHIBIT NOS. 9-A AND 9-B ATTACHED THERETO, ADMITTED INTO EVIDENCE.)

MR. DuMOND: Your Honor, Mr. Snead is available for cross-examination.

JUDGE STORMS: Thank you. Mr. Hartley?

MR. HARTLEY: No questions.

JUDGE STORMS: Mr. Polk, your witness.

MR. POLK: No questions, Your Honor.

JUDGE STORMS: Mr. Stewart?

MR. STEWART: Thank you.

CROSS-EXAMINATION OF MR. RONALD C. SNEAD,

QUESTIONS BY MR. STEWART:

Q Good morning, Mr. Snead.

A Good morning.

Q I just have a few clarifying points here I'd like to go through with you.

On Page 6 of your testimony at Line 9, you differentiate between Energy Resource Interconnection Service and Network Resource Interconnection Service.

A Yes.

Q Is Network Resource -- can you tell me what that -- is that when a plant is going to be a

designated network resource?
A Yes. They would study it to provide reassurance of deliverability as opposed to the Energy Resource which you would operate more on an as-available basis from a transmission capacity perspective.
Q This plant would be a designated Network Resource with the Midwest ISO?
A I would expect it to be, yes.
Q If you could turn to Page 8, there's -- on Line 16, there's a reference to potential upgrades to the IPL system, approximately $200,000, and then if I look back at your Exhibit 9-A, Page 3 --
A Yes.
Q -- at the very end, it says worst-case scenario assuming IPL needs to raise every other tower, and I see a $20 million figure.
A Yes.
Q Can you explain the differences between those two?
A Yes. If you look above in Exhibit 9-A, you'll see some $390,000 approximately to conduct a Lidar study, and what this study does is it looks at the clearance of the conductor in the

ground, so once that study was conducted, it was determined that a handful of towers could be raised to get the clearances that we needed to upgrade the line, and the estimates are about $200,000 for that.

Q Okay, and is that to keep the line from being too close to the ground; is that what that is?

A Yes.

Q So, 9-A was more preliminary than some of the information in your actual testimony?

A Yes.

Q Okay, and in 9-A, again, there are several aspects that relate to the plant not being fully deliverable.

Are those -- and looking back to Page 8, because I don't see these numbers of $7.2 million, and I may have missed them in either Exhibit 9-A or 9-B, would this plant be 100 percent deliverable with the expenditure of $7.2 million referenced on Page 8?

A MISO is currently conducting an amended deliverability study. The reason why it had to be amended was because the unit configuration was such that it was generating more megawatts than what we had studied, so we

went back with an amended request to MISO to look at it. We would expect the results from that fairly shortly.

Q Okay. So, at this point as we sit here today, you don't know what the cost of upgrades will be until you get the results of the new MISO study?

A We don't know the exact costs, but our feeling is the $20 million would be adequate, and that would be an outlier.

Q And are the upgrades that are referenced -- Let me rephrase.

Was the application made on behalf of Duke and Vectren?

A I don't know.

Q Do you know if the study that was -- that's 9-B here, the interconnection feasibility study, addressed issues relating to deliverability of the output for both Duke and Vectren, or if it was just solely addressing Duke?

A 9-B doesn't look at deliverability. They're two distinct studies within the MISO world.

9-B looks at the impact of adding additional generation in a particular area and

trying to ascertain if it creates any particular system problems as a result of its location of its generation.

Q And I was under the assumption that if it does create those problems, you would be limited on the amount of power that you would actually be able to deliver to the grid.

A In the system impact study, you're not looking at congestion as the MISO looks at it.

What you're looking at are NERC and RFC reliability criteria, outage one line, see if anything else overloads. That's the criteria being used to gauge the plant performance in 9-B, not LNP type of congestion numbers.

Q When do you expect the MISO updated study to be completed?

A We don't know exactly. I would expect it to be within a few weeks or a couple of months.

MR. STEWART: Thank you, Mr. Snead.

JUDGE STORMS: Mr. Mohler, your witness.

CROSS-EXAMINATION OF MR. RONALD C. SNEAD,
QUESTIONS BY MR. MOHLER:

Q Hello, Mr. Snead.
A Good morning.
Q Are you familiar with the Midwest ISO MTEP? I believe it stands for Midwest Transmission Expansion Plan.
A Somewhat, I guess.
Q Do you know if this IGCC plant was considered as part of the MTEP?
A I believe it will be in the upcoming MTEP.
Q Is that this fall or --
A Yes.
Q Is it known at this time whether the IGCC plant will have -- the transmission upgrades associated with the IGCC plant will have any reliability benefits to MISO generally?
A I would say we don't know at this time. As I stated earlier, we're still doing some study work at the revised output level.
Q And if reliability benefits are shown, is it your position that it will be sent to RECB under MISO, which is Regional Expansion Cost Benefit?
A It may be. The MISO does have definite

criteria that you need to meet in order to be eligible for cost sharing.

I also understand that the Board reached a vote on it, but assuming those are met, it could be eligible.

MR. MOHLER: Thank you. No further questions.

JUDGE STORMS: Thank you. OUCC?

MR. ENDRIS: No questions, Your Honor.

JUDGE STORMS: Redirect for this witness?

MR. DuMOND: One moment.

No questions.

JUDGE STORMS: Mr. Snead, thank you very much for your testimony. You may step down.

Let's go ahead break for lunch. We'll reconvene here at 1:00 P.M.

(WITNESS RONALD C. SNEAD EXCUSED)

(HEARING IN RECESS UNTIL 1:00 P.M., SAME DAY)