

LAW OFFICE OF
ROBERT W. KAYLOR, P.A.
3700 GLENWOOD AVENUE, SUITE 330
RALEIGH, NORTH CAROLINA 27612
(919) 828-5250
FACSIMILE (919) 828-5240

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MAR 11 2011
Clerk's Office
N.C. Utilities Commission

March 11, 2011

Ms. Renné C. Vance, Chief Clerk
North Carolina Utilities Commission
4325 Mail Service Center
Raleigh, North Carolina 27699-4325

RE: Docket No. E-7, Sub 819

Dear Ms. Vance:

Enclosed for filing are the original and thirty (30) copies of Duke Energy Carolinas, LLC's Rebuttal Testimony of James E. Rogers, Dhiaa M. Jamil, and Janice D. Hager in the above referenced docket.

We are also filing 17 confidential copies of the Rebuttal Testimony of Janice D. Hager and a confidential version of Exhibit A to her testimony.

Sincerely,

Robert W. Kaylor/k

Robert W. Kaylor

Encls.

cc: Parties of Record

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BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

FILED

MAR 11 2011

DOCKET NO. E-7, SUB 819

Clerk's Office
N.C. Utilities Commission

Revised Amended Application of Duke Energy	)	REBUTTAL TESTIMONY OF
Carolinas, LLC for Approval of Decision to Incur	)	JAMES E. ROGERS FOR
Nuclear Generation Project Development Costs	)	DUKE ENERGY CAROLINAS, LLC

I. INTRODUCTION AND PURPOSE

1 **Q. PLEASE STATE YOUR NAME, ADDRESS AND POSITION WITH DUKE**
2 **ENERGY CORPORATION.**

3 **A. My name is James E. Rogers, and my business address is 526 South Church**
4 **Street, Charlotte, North Carolina. I am Chairman, President, and Chief Executive**
5 **Officer (“CEO”) of Duke Energy Corporation (“Duke Energy”). Duke Energy**
6 **Carolinas, LLC (“Duke Energy Carolinas” or the “Company”) is a subsidiary of**
7 **Duke Energy.**

8 **Q. HAVE YOU PREVIOUSLY CAUSED DIRECT AND SUPPLEMENTAL**
9 **TESTIMONY TO BE FILED IN THIS PROCEEDING?**

10 **A. Yes. I filed direct testimony on November 15, 2010 and supplemental testimony**
11 **on February 8, 2011 in this docket.**

12 **Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?**

13 **A. The purpose of my rebuttal testimony is to respond to the testimony of Michael**
14 **Maness and Kennie Ellis, filed on behalf of the Public Staff on February 24, 2011,**
15 **and the testimony of Peter Bradford, filed on behalf of the Public Advocacy**
16 **Groups on February 24, 2011.**

17 **Q. PUBLIC ADVOCACY GROUPS WITNESS BRADFORD BASES**
18 **CERTAIN OF HIS ARGUMENTS IN THIS CASE ON THE IMPACTS**
19 **THE RECESSION AND LOW NATURAL GAS PRICES HAVE HAD ON**
20 **DEVELOPMENT SCHEDULES OF SOME NUCLEAR CONSTRUCTION**
21 **PROJECTS AROUND THE NATION. HAVE THESE FACTORS ALSO**
22 **AFFECTED THE LEE NUCLEAR PROJECT?**

1 A. Yes. The recent economic downturn has caused a short-term reduction in demand
2 for electricity. Furthermore, the market's anticipation of abundant shale gas
3 production has depressed forward natural gas prices, making gas-fired generation
4 more competitive. Although both of these events have delayed the need for new
5 nuclear capacity and caused the developers of several U.S.-based nuclear
6 construction projects, including Duke Energy Carolinas' proposed Lee Nuclear
7 Station, to move their construction dates, they do not eliminate the need for new
8 nuclear generation. As demonstrated in the Company's 2010 Integrated Resource
9 Plan ("IRP"), new nuclear generation remains the appropriate economic choice
10 for customers despite the short-term impacts from the economy and the effects
11 shale gas is having on natural gas markets.

12 **Q. WHY HAVEN'T ALL NUCLEAR DEVELOPMENT PROJECTS**
13 **EXPERIENCED THE SAME DELAYS?**

14 A. Duke Energy Carolinas has taken a deliberate, methodical approach to developing
15 the proposed Lee Nuclear Station. However, not all new nuclear development
16 projects have been proposed under similar market regulation or technology
17 choices. These differences can account for the different construction timelines for
18 each project. For example, several nuclear projects, including Constellation
19 Energy's Calvert Cliffs Unit 3, NRG Energy's South Texas Project, and Exelon's
20 Victoria County Station, were proposed in deregulated markets. Electricity
21 markets in these jurisdictions present nuclear construction projects with very
22 different challenges than regulated markets present. In regulated markets, like
23 North and South Carolina, utilities continue to have the obligation to plan for and

1 serve retail customers over the long-term. The regulators and utilities in these
2 markets continue to employ detailed integrated resource planning processes to
3 monitor energy and capacity needs and evaluate resource options. New nuclear
4 projects are subject to regulatory review and approval before, during, and after
5 construction.

6 Aside from market regulation, a company's reactor design and vendor
7 selection can also affect a project's development timeline. For example, TVO in
8 Finland, cited by Public Advocacy Groups Witness Bradford, chose AREVA's
9 EPR reactor design for its Olkiluoto Unit 3 project, which has experienced several
10 delays due to various construction-related issues. Duke Energy Carolinas, on the
11 other hand, selected Shaw Nuclear and Westinghouse Electric Company's
12 AP1000 reactor design. The Company is following the progress of reference
13 plant AP1000 projects at V.C. Summer and Vogtle, as well as those AP1000
14 projects in China, which are further along in their respective development and
15 construction than Lee Nuclear Station. The lessons learned from these projects
16 are being incorporated into Lee Nuclear Station and should reduce the
17 construction risk to the Company's customers.

18 **Q. PUBLIC ADVOCACY GROUPS WITNESS BRADFORD ALLEGES THE**
19 **PRESENT APPLICATION, IF APPROVED, WOULD EXPOSE DUKE**
20 **ENERGY CAROLINAS' CUSTOMERS TO COSTS AND HARM? IS**
21 **THIS TRUE?**

22 **A.** No, it is not. The continued development of Lee Nuclear Station as a potential
23 future resource for Duke Energy Carolinas' customers is beneficial to customers.

1 The Company has purposefully taken a measured and deliberate approach with
2 respect to the continued development of this important resource to limit the
3 potential risk to its customers during this long lead time process. In the context of
4 this Amended Application, the Public Advocacy Groups Witness Bradford makes
5 several of the same arguments that he made during the prior proceeding in this
6 docket.

7 For example, Witness Bradford warns against “shifting the risk of loss” to
8 customers and charging “large costs to captive customers,” and advocates for
9 placing caps on the overall cost of the Lee Nuclear Station project. He also
10 recommends requiring a competitive power procurement process and requiring
11 the Company to demonstrate that it has maximized all cost-effective energy
12 efficiency before the Commission can deem any decision to build a nuclear plant
13 to be prudent. This testimony reflects a misunderstanding of the scope and
14 breadth of the project development application process under N.C. Gen. Stat. §
15 62-110.7. This proceeding seeks approval of the Company’s decision to continue
16 to incur project development costs for Lee Nuclear Station. The Company is not
17 seeking a Certificate of Public Convenience and Necessity for this project. As
18 noted by the North Carolina Utilities Commission (“the Commission”) in its
19 Order Approving Decision to Incur Project Development Costs issued on June 11,
20 2008 in this docket,

21 [m]ost of the recommendations made by the Groups appear to be
22 based on the assumption that this proceeding entails greater
23 assurances than it will actually provide. . . many of the concerns
24 expressed by the Groups are more appropriately addressed in a
25 certificate proceeding or its equivalent or in other proceedings in

1 which the prudence and reasonableness of specific activities and
2 costs will be evaluated and determined. Order at 12.
3

4 In the future, when the Company determines it is prudent to proceed to
5 construction of Lee Nuclear Station and seeks to incorporate any project costs into
6 customer rates, it will first have to seek this Commission's approval and will have
7 to meet all relevant statutory requirements at that time.

8 **Q. THE PURSUIT OF NUCLEAR DEVELOPMENT PARTNERS HAS BEEN**
9 **DESCRIBED BY PUBLIC STAFF AS "SLOW." DO YOU AGREE WITH**
10 **THIS CHARACTERIZATION FOR LEE NUCLEAR STATION?**

11 **A.** No. Partnerships, unlike some construction-related aspects of the project, do not
12 follow a predefined schedule for completion. Duke Energy remains a proponent
13 of regional nuclear development and is committed to adding partners for Lee
14 Nuclear Station in a prudent, deliberate manner. While it has been approximately
15 three years since Duke Energy filed a combined operating license ("COL")
16 application with the NRC, the target commercial operation date for Lee Nuclear
17 Station remains approximately ten years ahead of us. There remains ample time
18 to include additional partners in the Lee Nuclear Station. Consistent with the
19 Company's regional nuclear development strategy, Duke Energy Carolinas also
20 continues to explore participation in other regional nuclear generation projects
21 where the Company's participation in such project would be beneficial to its
22 customers.

23 **Q. THE PUBLIC STAFF WITNESSES SPECIFICALLY DISCUSSED DUKE**
24 **ENERGY CAROLINAS' EFFORTS TO JOIN SOUTH CAROLINA**
25 **ELECTRIC & GAS AND SANTEE COOPER IN THE NEW NUCLEAR**

1 **PLANTS PLANNED FOR SUMMER NUCLEAR STATION. WHAT IS**
2 **THE COMPANY'S POSITION ON THIS ISSUE?**

3 A. Duke Energy Carolinas is committed to regional nuclear generation and to
4 prudently managing and sharing the risks associated with new nuclear
5 development. The process of evaluating partnership opportunities is neither
6 simple nor quick. Partnerships in a new nuclear facility will likely last a very
7 long time, so adequate deliberation and due diligence is necessary. Both Duke
8 Energy Carolinas and its potential partners must evaluate the financial ability of
9 the potential partner to pay for new nuclear generating facilities now and into the
10 future. The parties must also analyze how a partner would be integrated into the
11 process for obtaining the Combined Construction and Operating License ("COL")
12 from the U.S. Nuclear Regulatory Commission for the subject facility. Because
13 of the long life cycle of nuclear development and the significant costs and
14 potential financial risk associated with ownership of a nuclear generating facility,
15 the process of negotiating an acceptable partnership arrangement takes a
16 substantial amount of time and effort. No party enters into such an agreement
17 lightly and many discussions, meetings, exchanges of information and draft
18 agreements occur during the due diligence and negotiation process. It should be
19 noted that most of the discussions between the Company and potential partners
20 are covered by confidentiality agreements that limit the information either party
21 can disclose.

22 As previously stated in my supplemental testimony filed in this docket, the
23 Company recently executed an agreement with JEA giving it the option to

1 purchase not less than five and not more than twenty percent of the proposed Lee
2 Nuclear Station at a future point in time. Additionally, since the filing of my
3 direct and supplemental testimony, discussions between Duke Energy Carolinas
4 and Santee Cooper regarding the Company's potential participation in the new
5 units at V.C. Summer Nuclear Plant ("Summer") have continued. The Company
6 hopes these discussions will lead to mutually beneficial opportunities for risk
7 sharing for Lee Nuclear Station and the new Summer units. Duke Energy
8 Carolinas is pursuing this opportunity at a steady, deliberate pace, recognizing the
9 potential long-term ramifications of a partnership in new nuclear generation.
10 Duke Energy Carolinas will continue to keep the Commission apprised of
11 partnership developments.

12 **Q. IF THE COMMISSION APPROVES DUKE ENERGY CAROLINAS'**
13 **DECISION TO CONTINUE TO INCUR PROJECT DEVELOPMENT**
14 **COSTS RELATED TO LEE NUCLEAR STATION, SHOULD THE**
15 **COMPANY'S ALLOWED RETURN ON EQUITY ("ROE") BE REDUCED**
16 **IN ITS NEXT GENERAL RATE CASE AS RECOMMENDED BY PUBLIC**
17 **ADVOCACY GROUPS WITNESS BRADFORD?**

18 A. No, a Commission order approving the present application only approves the
19 Company's decision to continue incurring costs related to pre-development work
20 on the Lee Nuclear Station project. It does not approve the decision to build the
21 facility, nor does it eliminate the licensing, permitting, and construction risks
22 associated with the project. The Company believes the risks in successfully
23 developing, designing, and constructing Lee Nuclear Station are not mitigated by

1 the Commission's approval of Duke Energy Carolinas' decision to continue
2 developing this project through the receipt of the COL for Lee Nuclear Station.
3 Thus, it would be inappropriate to reduce the Company's allowed ROE based on
4 the result of this single proceeding.

5 **Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

6 **A. Yes, it does.**

BEFORE THE NORTH CAROLINA PUBLIC SERVICE COMMISSION

FILED

DOCKET NO. E-7, SUB 819

MAR 11 2011

**Clerk's Office
N.C. Utilities Commission**

Revised Amended Application of Duke Energy	)	REBUTTAL TESTIMONY OF
Carolinas, LLC for Approval of Decision to Incur	)	DHIAA M. JAMIL FOR
Nuclear Generation Project Development Costs	)	DUKE ENERGY CAROLINAS, LLC

1 **Q. PLEASE STATE YOUR NAME, ADDRESS, AND POSITION.**

2 A. My name is Dhiaa M. Jamil. My business address is 526 South Church Street,
3 Charlotte, North Carolina. I am Group Executive, Chief Generation Officer for
4 Duke Energy Corporation (“Duke Energy”) and Chief Nuclear Officer for Duke
5 Energy Carolinas, LLC (“Duke Energy Carolinas” or the “Company”).

6 **Q. HAVE YOU PREVIOUSLY FILED DIRECT TESTIMONY IN SUPPORT**
7 **OF DUKE ENERGY CAROLINAS’ APPLICATION IN THIS DOCKET?**

8 A. Yes.

9 **Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?**

10 A. My rebuttal testimony addresses the Joint Testimony of Michael C. Maness and
11 Kennie D. Ellis on behalf of the Public Staff North Carolina Utilities Commission
12 (“Public Staff”) filed in this docket on February 24, 2011. Specifically, I explain
13 why the Commission should not change the limit of the time period for the
14 Company’s pursuit of project development activities to January 1, 2011, through
15 June 30, 2012, or change the limit of the dollar amount spent on such activities to the
16 North Carolina allocable share of \$120 million. I believe that imposing such
17 limitations is unwarranted and could unduly hamper the Company’s efforts to
18 preserve the nuclear option for its customers in the 2021 time frame. I urge the
19 Commission to approve the Company’s application as filed.

20 **Q. WHAT IS THE PUBLIC STAFF’S POSITION WITH RESPECT TO THE**
21 **REQUESTED TIME AND MAXIMUM DOLLAR LIMITS?**

22 A. On Page 13 of their pre-filed Joint Testimony, Public Staff witnesses Maness and
23 Ellis state their recommendation that “the Commission should limit its approval of
24 Duke’s decision to incur additional project development costs to a lower dollar

1 amount and shorter time period than requested in Duke's application." They go on
2 to state that the Commission should limit the time period to January 1, 2011, through
3 June 30, 2012 and set a maximum expenditure level of the North Carolina allocable
4 portion of \$120 million. They also state that although they do not consider the
5 Company's decision to continue to incur development costs in 2010 to be
6 unreasonable, "the Commission should not include in its decision a specific amount
7 of dollars already spent." Public Staff Testimony at 14.

8 **Q. PLEASE COMMENT ON THE PUBLIC STAFF'S POSITIONS.**

9 A. Initially, let me say that the Company appreciates the Public Staff's support of its
10 Application. However, Duke Energy Carolinas respectfully disagrees with the
11 Public Staff's preference for a shorter project development period and the
12 correspondingly lower maximum amount of \$120 million. We also disagree with its
13 position with respect to the expenditures made by Duke Energy Carolinas during
14 calendar year 2010 to continue to develop Lee Nuclear Station. As I explained in
15 my direct testimony, the development work to be conducted through 2013 is
16 necessary to ensure that the Company can secure a Combined Construction and
17 Operating License ("COL") in 2013 and to continue to preserve the option to have
18 Lee Nuclear Station available to serve customers in the 2021 timeframe. The
19 Company has completed significant development work to date and has a
20 correspondingly significant amount planned over the next three years. A great deal
21 of the development work planned for 2011, 2012 and 2013 is an extension of the
22 work commenced in 2008, and Commission approval of Duke Energy Carolinas'
23 decision to incur development costs through the Company's receipt of its COL from

1 the U.S. Nuclear Regulatory Commission will be more efficient and reduce the
2 likelihood of possible delay or interruption.

3 **Q. PLEASE EXPLAIN WHY THE PUBLIC STAFF'S RECOMMENDED COST**
4 **AND TIMING LIMITATIONS ARE NOT REASONABLE?**

5 A. The Public Staff bases its position on the "current uncertainty with respect to carbon
6 legislation, the need for Duke to conduct a comprehensive reserve margin study, the
7 potential for further delay in the need for nuclear generation, the high costs
8 associated with nuclear construction, and the need for in-depth exploration of
9 sharing the costs and risks of nuclear construction, whether with respect to
10 SCE&G/Santee Cooper Summer plant or otherwise." Public Staff Testimony at 14.
11 Duke Energy Carolinas Witnesses Rogers and Hager address aspects of the Public
12 Staff's concern in his and her respective testimony, and I believe it is important to
13 note that many of these uncertainties have existed for some time now and may
14 continue to exist beyond June 30, 2012.

15 Duke Energy Carolinas' analysis, as described by Company Witness Hager,
16 is based on the facts as they exist at present and taking into account the dynamic
17 planning environment in which we are operating. It shows that new nuclear
18 generation is the right resource for our customers in the 2021 timeframe. June 30,
19 2012 appears to be an arbitrary point in time selected by the Public Staff; it does not
20 relate in any meaningful way to the Company's COL or project development
21 schedule. Also, if the Commission were to limit its approval to the time period
22 recommended by the Public Staff, the Company would need to file another project
23 development application this year to attempt to receive approval of its decision to

1 incur the additional costs to be incurred through its projected receipt of COL in
2 2013. Several, if not all, of the factors listed by the Public Staff will likely remain
3 uncertain through the end of this year and beyond. The Company has every
4 incentive to cease its project development efforts if it determines that such
5 development is no longer in the best interest of its customers.

6 Based on the information currently available to the Company, allowing the
7 Company to incur project development costs through December 31, 2013, as
8 requested in the its amended application provides the Company with the necessary
9 flexibility to continue the development of Lee Nuclear Station to its next significant
10 milestone: issuance of a COL. As explained in our Application, my direct
11 testimony and the testimony of other Company witnesses, we believe it is prudent to
12 incur the requested project development costs to continue to preserve Lee Nuclear
13 Station as an option to serve our customers' needs in the 2021 timeframe.

14 **Q. PLEASE EXPLAIN WHY THE COSTS INCURRED BY DUKE ENERGY**
15 **CAROLINAS IN 2010 TO CONTINUE TO DEVELOP LEE NUCLEAR**
16 **STATION SHOULD BE COVERED BY A COMMISSION APPROVAL OF**
17 **THE COMPANY'S PRESENT APPLICATION.**

18 **A.** As the Company's analyses have continued to support new nuclear generation to
19 meet our customers' energy needs in the future, we have continued our development
20 efforts without interruption or delay so as to stay on schedule for the projected
21 receipt of the COL and to keep Lee Nuclear Station available as a potential resource
22 to serve customers in the 2021 timeframe. Public Staff witnesses Maness and Ellis
23 themselves state that this was not unreasonable, and do not contest the Company's

1 decision to incur such costs. Importantly, the Commission has approved the
2 Company's Integrated Resource Plans ("IRPs") filed in 2008 and 2009 in Docket
3 Nos. E-100, Sub 118 and E-100, Sub 124¹, respectively, that selected new nuclear
4 generation as the appropriate resource to meet Duke Energy Carolinas' customer's
5 needs in the future. The Company's decision to incur development costs during
6 2010 was consistent with the results of its planning analyses, which have been
7 deemed to be reasonable by both the Public Staff and the Commission for planning
8 purposes. As such, I believe the Commission should find that the Company's
9 decision to continue to incur development costs in 2010 was reasonable and prudent
10 under the circumstances, and such costs should be included in any order approving
11 the Company's decision to incur project development costs in this regard.

12 **Q. DOES THIS CONCLUDE YOUR PRE-FILED REBUTTAL TESTIMONY?**

13 **A.** Yes, it does.

¹ *Order Approving Integrated Resource Plans and REPS Compliance Plans*, issued in Docket Nos. E-100, Sub 118 and E-100, Sub 124 on August 10, 2010.

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BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

FILED

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DOCKET NO. E-7, SUB 819

Clerk's Office
N.C. Utilities Commission

Revised Amended Application of Duke Energy	)	REBUTTAL TESTIMONY OF
Carolinas, LLC for Approval of Decision to Incur	)	JANICE D. HAGER FOR
Nuclear Generation Project Development Costs	)	DUKE ENERGY CAROLINAS, LLC

I. INTRODUCTION AND PURPOSE

1 **Q. PLEASE STATE YOUR NAME, ADDRESS AND POSITION WITH DUKE**
2 **ENERGY CORPORATION.**

3 **A. My name is Janice D. Hager. My business address is 526 South Church Street,**
4 **Charlotte, North Carolina. I am Vice President, Integrated Resource Planning and**
5 **Regulated Analytics for Duke Energy Business Services LLC, the service**
6 **company subsidiary of Duke Energy Corporation (collectively “Duke Energy”)**
7 **and an affiliate of Duke Energy Carolinas, LLC (“Duke Energy Carolinas” or the**
8 **“Company”).**

9 **Q. DID YOU PREVIOUSLY FILE DIRECT TESTIMONY IN THIS CASE?**

10 **A. Yes.**

11 **Q. PLEASE SUMMARIZE YOUR REBUTTAL TESTIMONY.**

12 **A. In my rebuttal testimony, I address issues raised by Public Staff witnesses**
13 **Michael Maness and Kenneth Ellis and by the Public Advocacy Group’s witness,**
14 **Peter Bradford. In my rebuttal, I reaffirm the need for and cost-effectiveness of**
15 **the Lee Nuclear Project even in light of changing circumstances and a number of**
16 **uncertainties.**

17 **II. NEED FOR THE PROJECT**

18 **Q. MR. BRADFORD CLAIMS ON PAGE 5 OF HIS TESTIMONY THAT**
19 **THE NEED FOR POWER HAS DROPPED DRAMATICALLY SINCE**
20 **THE 2008 PROCEEDING. PLEASE ADDRESS HIS CLAIM.**

21 **A. Mr. Bradford is not making an “apples-to-apples” comparison. For example, the**
22 **7000 megawatts (“MWs”) of resources needed by 2018 referenced in the 2008**

1 proceeding includes the needs that are being met by Cliffside Unit 6 and the Buck
2 and Dan River combined cycle plants. Because these are now committed
3 resources, they are excluded in the 2200 MW need in 2020 and 6000 MW need in
4 2030 referenced by Mr. Rogers in this proceeding. This alone accounts for 2100
5 MWs in the reduction of need.

6 As noted by Mr. Bradford, the load forecast is lower in the analyses used
7 in this proceeding as compared to the forecast used in the 2008 proceeding.
8 Specifically, the load forecast incorporated into the 2010 Integrated Resource
9 Plan ("IRP") is lower by about 2000 MWs in the 2018 to 2021 timeframe than
10 reflected in the 2007 IRP (the basis for the 2008 proceeding).

11 Despite Mr. Bradford's allegations to the contrary, based on the
12 Company's analysis, Duke Energy Carolinas has a definite need for capacity that
13 Lee Nuclear Station could satisfy. There is no question of whether there is a need
14 for additional resources; the question is what is the best mix of resources to meet
15 that need. Our analyses, as reflected in my direct testimony and the 2010 IRP,
16 demonstrate that a portfolio made up of Lee Nuclear Station and the addition of a
17 mix of renewable resources, energy efficiency, and natural-gas fired resources is
18 the best portfolio for meeting customers' energy needs in a reliable, economical
19 manner.

20 **Q. THE PUBLIC STAFF ALSO EXPRESSES CONCERN ABOUT THE**
21 **COMPANY'S 17% RESERVE MARGIN. PLEASE SPEAK TO THE**
22 **CONCERN.**

1 A. Duke Energy Carolinas has used a 17% target reserve margin for its resource
2 planning for well over 10 years. The Company's rationale for its target reserve
3 margin is presented in each IRP, in accordance with the requirements of the North
4 Carolina Utilities Commission's ("the Commission") rules regarding the contents
5 of the IRP and past Commission orders in utilities' IRPs. In its August 10, 2010
6 *Order Approving Integrated Resource Plans and REPS Compliance Plans* in
7 NCUC Docket Nos. E-100, Sub 118 and 124, the Commission found that the
8 reserve margins of the utilities, including that used by Duke Energy Carolinas,
9 "are reasonable and should be approved." See Order at 9.¹ In the context of the
10 currently pending IRP proceeding in Docket No. E-100, Sub 128, the Public Staff
11 recommended that the Company be required to conduct a reserve margin study.
12 The Company noted in its reply comments that it did not believe a comprehensive
13 study was appropriate at this time. Duke Energy Carolinas' reply comments
14 requested that if the Commission were to determine such a study is required that
15 allow the study be conducted to consider the impact of the proposed merger
16 between Duke Energy and Progress Energy, Inc. for a 2012 IRP filing. Such a
17 study would incorporate the resource planning impacts of the planned joint
18 dispatch of resources for Duke Energy Carolinas and Progress Energy Carolinas
19 following the close of the merger of the holding companies of the two utilities. At
20 present, however, the Company remains confident based on its historical
21 experience that its target planning reserve margin of 17% is reasonable and
22 appropriate under the circumstances.

¹ This finding is verbatim from the Public Staff's proposed order in that docket.

1 Q. WOULD AN INCREASE OR DECREASE IN THE RESERVE MARGIN
2 AS A RESULT OF A STUDY HAVE AN IMPACT ON THE NEED FOR
3 THE LEE NUCLEAR PROJECT?

A. A change in the level of the reserve margin would have little, if any, impact on the need for and economics of Lee Nuclear Station. For example, if the conclusion of a comprehensive reserve margin study referenced above was that Duke Energy Carolinas should raise or lower its reserve margin,² the likely impact to ALL portfolios considered in the Company's IRP would relate to the amount and timing of peaking capacity. Such a change would have a similar impact on the capacity costs of all portfolios and have no appreciable impact on the production costs of the portfolios. Thus, hypothetical changes to the Company's target reserve margin would simply not have a material impact on the need for or economic analyses of Lee Nuclear Station.

14 **III. OTHER ISSUES**

15 Q. IS THE PUBLIC STAFF CONCERN THAT DUKE ENERGY
16 CAROLINAS HAS NOT PROVIDED A NO- OR LOW-CARBON
17 REGULATION SCENARIO IN ITS IRP WARRANTED?

18 A. No. Duke Energy Carolinas provided three carbon scenarios in its 2010 IRP – a
19 base carbon case, a high carbon sensitivity, and a Clean Energy Standard
20 sensitivity. In each of these cases, portfolios with nuclear generation were more
21 cost-effective than those without nuclear resources. While I think most would

² It is unlikely that a study would result in a significant change in Duke Energy Carolinas' target planning reserve margin. The target planning reserve margins for utilities are typically in the teens. A reserve margin below this level would increase the likelihood of exceeding the industry accepted standard 1 day in 10 years loss of load probability.

1 agree that carbon cap-and-trade legislation is not likely in the next few years, we
2 believe carbon regulation or legislation over the life of the proposed Lee Nuclear
3 Station remains likely. The U.S. Environmental Protection Agency ("EPA") has
4 authority to regulate carbon emissions and is moving forward with doing so.
5 Clean Energy Standard legislation has been proposed by President Obama and is
6 currently being discussed in Congress. While a "no carbon" future is a
7 possibility, the Company did not include a no carbon case in our 2010 IRP
8 because we firmly believe it is a matter of how and when, not if, carbon emissions
9 will be regulated.

10 Finally, it is important to remember that Duke Energy Carolinas is seeking
11 to preserve the option for Lee Nuclear Station through this proceeding. The
12 Company is not seeking a Certificate of Public Convenience and Necessity
13 ("CPCN") in the present application. It certainly does not seem reasonable to stop
14 the pre-construction or project development activities because of the uncertainties
15 related to the legislation/regulation of carbon emissions.

16 **Q. DID YOU PERFORM A NO CARBON SENSITIVITY?**

17 A. Yes. Based on the Public Staff's interest in the "no carbon" possibility, the
18 Company recently analyzed a "no carbon" sensitivity to its base case portfolio.
19 We removed carbon emission prices from our production costing model and
20 compared the portfolio with nuclear resources to the portfolio without new
21 nuclear resources under the Base EE assumptions. The Public Staff interpreted
22 this analysis as showing "that under a no carbon regulation scenario, the [portfolio
23 made up of combustion turbines ("CTs") and combined cycle ("CC"), the CT/CC

1 Portfolio,] was [BEGIN CONFIDENTIAL [REDACTED] – END
2 CONFIDENTIAL] more cost effective than the two nuclear unit portfolio.”
3 (Public Staff Testimony at page 10, lines 10 through 12). The Public Staff has
4 misunderstood the results. In the no-carbon analysis, the CT/CC Portfolio is
5 actually [BEGIN CONFIDENTIAL] [REDACTED] [END CONFIDENTIAL] more
6 cost-effective than the 2 Nuclear portfolio. However, it is important to note that if
7 we were truly in a “no carbon future,” new coal generation may be cost effective
8 and would likely replace the natural gas combined cycles in the CT/CC portfolio.

9 **Q. THE PUBLIC STAFF SAYS THAT A MID CARBON, LOW FUEL COST**
10 **SCENARIO WOULD “SUBSTANTIALLY” DELAY NEW NUCLEAR. DO**
11 **YOU AGREE?**

12 **A.** No. The Public Staff’s conclusions appear to be based upon our System
13 Optimizer (“SO”) model results. We use the SO model to aid in the creation of
14 portfolios for more detailed analyses. For each set of assumptions, SO will create
15 the optimal resource portfolio. We perform analyses with SO using base
16 assumptions and many sensitivities. Each analysis creates a unique portfolio.
17 From these analyses, we create representative portfolios for analysis in our more
18 detailed production costing model, Planning and Risk (“PAR”). The SO model
19 selected varying amounts of nuclear between 2016 and 2030 depending upon the
20 assumptions used. The Public Staff has highlighted one set of results. The
21 Company looks at all of the results and then creates portfolios to represent the
22 reasonable range of potential portfolios that could be beneficial to customers
23 under a wide variety of potential future outcomes. Based on the SO results, we

1 created five portfolios for analysis in the 2010 IRP. One of those was a portfolio
2 with nuclear delayed until the 2026 – 2028 timeframe. Our analysis included
3 consideration of delay in the completion of Lee Nuclear Station, but the results
4 did not lead to a conclusion that delay was in the best interests of customers.

5 **Q. HOW DO THE PROPOSED MERGER WITH PROGRESS ENERGY, THE**
6 **OPTION WITH JEA, AND THE ACKNOWLEDGEMENT OF**
7 **DISCUSSIONS WITH SANTEE COOPER ON THE SUMMER NUCLEAR**
8 **PLANT IMPACT THE NEED FOR LEE NUCLEAR STATION?**

9 A. As discussed by Mr. Rogers, Duke Energy Carolinas views regional nuclear
10 generation as a prudent way to manage risk and provide benefits to customers.
11 Thus, we agree with the Public Staff that there are great potential benefits to
12 regional nuclear generation that can be realized by sharing costs and risks with
13 other entities. The proposed merger with Progress Energy, the option with JEA,
14 and the discussions with Santee Cooper all have the potential to further the goal of
15 regional nuclear generation. But none of these are certainties today. At this
16 point, our assumptions related to ownership of Lee Nuclear Station in the 2010
17 IRP reflect the current situation. As the items noted in the question become more
18 concrete, future analyses can address their impact.

19 Again, I note that we are seeking a determination that it is prudent for
20 Duke Energy Carolinas to preserve the Lee Nuclear Station option. We are not
21 seeking a CPCN. Yes, uncertainties exist, but based on what we know at this
22 time, I believe that going forward with project development is the most prudent
23 course of action.

1 **Q. HOW HAVE PROJECTIONS OF NATURAL GAS PRICES AND**
2 **CARBON ALLOWANCE PRICES CHANGED SINCE THE PREVIOUS**
3 **PROCEEDING?**

4 A. Mr. Bradford states that natural gas prices are significantly lower than they were
5 in 2008, citing a December 2010 EIA report. Duke Energy updates its projections
6 of market fundamental prices (natural gas, power, etc.) on an annual basis.
7 Interestingly, the projected long-term natural gas prices used in the 2010 IRP and
8 the 2007 IRP, which served as the basis for the 2008 proceeding, are remarkably
9 similar. The same is true of projected carbon allowance. As shown in Hager
10 Confidential Rebuttal Exhibit A and Hager Rebuttal Exhibit B,³ the values have
11 been higher in the intervening years for both natural gas and carbon allowance
12 projected prices, but the 2010 and 2007 prices are similar.

13 Although the fact of these price projections is interesting, it is not
14 important. What is important is the results of our most recent analyses based on
15 our current assumptions. Duke Energy Carolinas' analyses do not bear out Mr.
16 Bradford's opinion that new nuclear is not likely to be cost-effective due to low
17 natural gas prices. The Company's analyses for the 2010 IRP clearly show the
18 portfolio with new nuclear generation is projected to be cost-effective for
19 customers even in light of prices that take into account the relatively low
20 projection for natural gas prices.

21 **Q. MR. BRADFORD DISMISSES YOUR CONCERN ABOUT NATURAL**
22 **GAS VOLATILITY. HOW DO YOU RESPOND?**

³ The Company considers natural gas projections to be market sensitive since the Company is in the market for natural gas on a regular basis. The Company has not considered the carbon allowance price projections confidential since there is no current market.

1 A. I continue to be concerned about an over-reliance on natural gas because of the
2 volatility of natural gas and the uncertainty of natural gas price projections.
3 Historically, the market price for natural gas has always exhibited a high degree
4 of price volatility, and long-term price forecasts have been equally fraught with
5 uncertainty. In the historical period between January 1, 2000 and June 2010, the
6 daily spot price at Henry Hub, LA, has fluctuated between \$1.69/MMBtu and
7 \$18.48/MMBtu, with those two price extremes occurring just 16 months apart.
8 Furthermore, although the spot price has averaged \$5.77/MMBtu over that time
9 span, it has closed above \$10/MMBtu on 148 separate trading days.

10 Hager Rebuttal Exhibit C shows the resource mix in 2030 under the
11 CC/CT portfolio as contrasted to the 2 Nuclear Units portfolio. The graphs show
12 that without the addition of the Lee Nuclear Station, the percentage of energy
13 generated from nuclear drops from 51% to 38% and the percentage of energy
14 generated from natural gas increases from 10% to 21%.

15 To put into perspective the impact of volatility of natural gas on customers
16 versus impact of the volatility of nuclear fuel prices, I looked at the impact of
17 doubling the cost of natural gas versus the impact of doubling the nuclear fuel cost
18 on each portfolio. See Table 1 for the impact of doubling natural gas prices and
19 Table 2 for the impact of doubling nuclear fuel cost below.

Table 1 - Impact on Fuel Cost if Natural Gas Price Doubles			
Fuel Costs in Millions (2030)			
	Base Fuel Costs	Natural Gas X 2	% Increase
CC/CT Port	\$6,300	\$8,900	41%
2 Nuc Port	\$4,900	\$6,200	27%
% Delta	27%	44%	

Table 2 - Impact of Fuel Cost if Nuclear Fuel Price Doubles			
Fuel Costs in Millions (2030)			
	Base Fuel Costs	Nuclear X 2	% Increase
CC/CT Port	\$6,300	\$6,900	10%
2 Nuc Port	\$4,900	\$5,800	18%
% Delta	27%	19%	

1 The first interesting item of note is the projected Base fuel costs in 2030
2 for the two portfolios. The projected fuel costs for the portfolio with no new
3 nuclear (CC/CT Portfolio) is 27% higher in 2030 than the portfolio with nuclear
4 (2 Nuclear Portfolio). As shown in Table 1, if the price of natural gas were to be
5 twice as high in 2030 as our current projections, the projected fuel costs for the
6 portfolio with no new nuclear costs is 44% higher than the portfolio with new
7 nuclear. As shown in Table 2, if the price of nuclear fuel costs were to be twice
8 as high in 2030 as our current projections, the fuel cost for the portfolio with new
9 nuclear is still projected to be 19% less than the portfolio without new nuclear.
10 Betting on long-term low natural gas prices does not appear to be the best course
11 of action.

12 **Q. IS THE COMPANY ANTI-NATURAL GAS?**

13 A. Certainly not. Duke Energy Carolinas is delighted to be adding its first combined
14 cycle plants to its fleet as part of its fleet modernization. All portfolios analyzed
15 for the 2010 IRP include new natural gas generation. The 2 Nuclear Units
16 portfolio includes 1,780 MWs of new CTs and 1,300 MWs of new CCs, whereas
17 the CC/CT portfolio includes 2,050 MWs of new CT generation and 3,250 MWs
18 of new CC generation.

1 Duke Energy Carolinas believes the best portfolio for customers includes
2 increases in nuclear generation as well as increases in natural gas, renewable, and
3 energy efficiency. It is “both/and,” not “either/or.”

4 **Q. MR. BRADFORD OFFERS A CENT/KWH PRICE OF NUCLEAR AND**
5 **NATURAL GAS FIRED GENERATION ON PAGE 8 OF HIS**
6 **TESTIMONY. WHAT IS YOUR VIEW OF HIS FIGURES?**

7 A. First, I note that he does not say that the cost of new nuclear is 12 cents/kwh and
8 natural gas is four to eight cents/kwh; he calls these an example. Therefore, I am
9 not certain if he is saying that he believes that is the cost of these resources.
10 Second, regardless of his calculations, levelized bus bar costs such as these are
11 meaningless in resource planning. Sophisticated models such as those we use at
12 Duke Energy Carolinas are needed to develop the most cost-effective portfolio of
13 resources for customers.

14 **Q. MR. BRADFORD CRITICIZES THE COMPANY FOR NOT DOING A**
15 **COMPETITIVE SOLICITATION FOR POSSIBLE POWER SUPPLY**
16 **RESOURCES. PLEASE RESPOND.**

17 A. As discussed in the 2010 IRP, although Duke Energy Carolinas evaluates the
18 competitive wholesale market for peaking and intermediate resources, the
19 Company’s purchased power philosophy does not currently include soliciting
20 purchased power bids for baseload capacity. Duke Energy Carolinas views baseload
21 capacity as fundamentally different from peaking and intermediate capacity.
22 Currently, there are two key concerns with relying upon the wholesale market for
23 baseload capacity. First, generation outside the control area could be subject to

1 interruption due to transmission issues more so than generation within the control
2 area. Second, supplier default could jeopardize the ability to provide reliable
3 service. The Company therefore believes that Duke Energy Carolinas-owned
4 baseload resources are the most reliable means for Duke Energy Carolinas to meet
5 its service obligations in a cost-effective and reliable manner.

6 **Q. MR. BRADFORD SAYS THAT NUCLEAR POWER IS NOT AN**
7 **EFFECTIVE STRATEGY FOR FIGHTING CLIMATE CHANGE. DO**
8 **YOU AGREE?**

9 A. I do not agree. I note that even Mr. Bradford hedges his statement by saying that
10 “if nuclear power can be built cost effectively, this contribution would make the
11 *climate change task easier*” (Bradford at 17). As we state in our 2010 IRP, we
12 believe that “to make real system reductions in CO₂ emissions additional nuclear
13 generation is needed” (2010 Carolinas IRP at 94). Hager Rebuttal Exhibit D
14 shows that without the addition of new nuclear generation, carbon emissions in
15 2030 will be substantially higher than in 2010, even with aggressive energy
16 efficiency efforts and while meeting the North Carolina renewable energy and
17 energy efficiency portfolio standard.

18 If we are serious in this country about reducing CO₂ emissions, we must
19 be serious about making new nuclear generation a reality.

20 **Q. MR. BRADFORD SAYS THAT NEW NUCLEAR GENERATION WILL**
21 **RESULT IN A LOSS OF JOBS DUE TO INCREASE IN ELECTRICITY**
22 **PRICES. PLEASE RESPOND TO THIS ALLEGATION.**

1 A. Our IRP analyses are designed to measure the impact of various plans on
2 customer rates. We use the metric of “present value of revenue requirements,”
3 with revenue requirements representing impact on customers. Thus, by selecting
4 portfolios with the best potential to minimize the present value of revenue
5 requirements, we are seeking to minimize the rate impacts on customers. Our
6 analyses show that it is in customers’ best interests for us to continue to pursue
7 the development of Lee Nuclear Station, given its potential to minimize the
8 impact to customers.

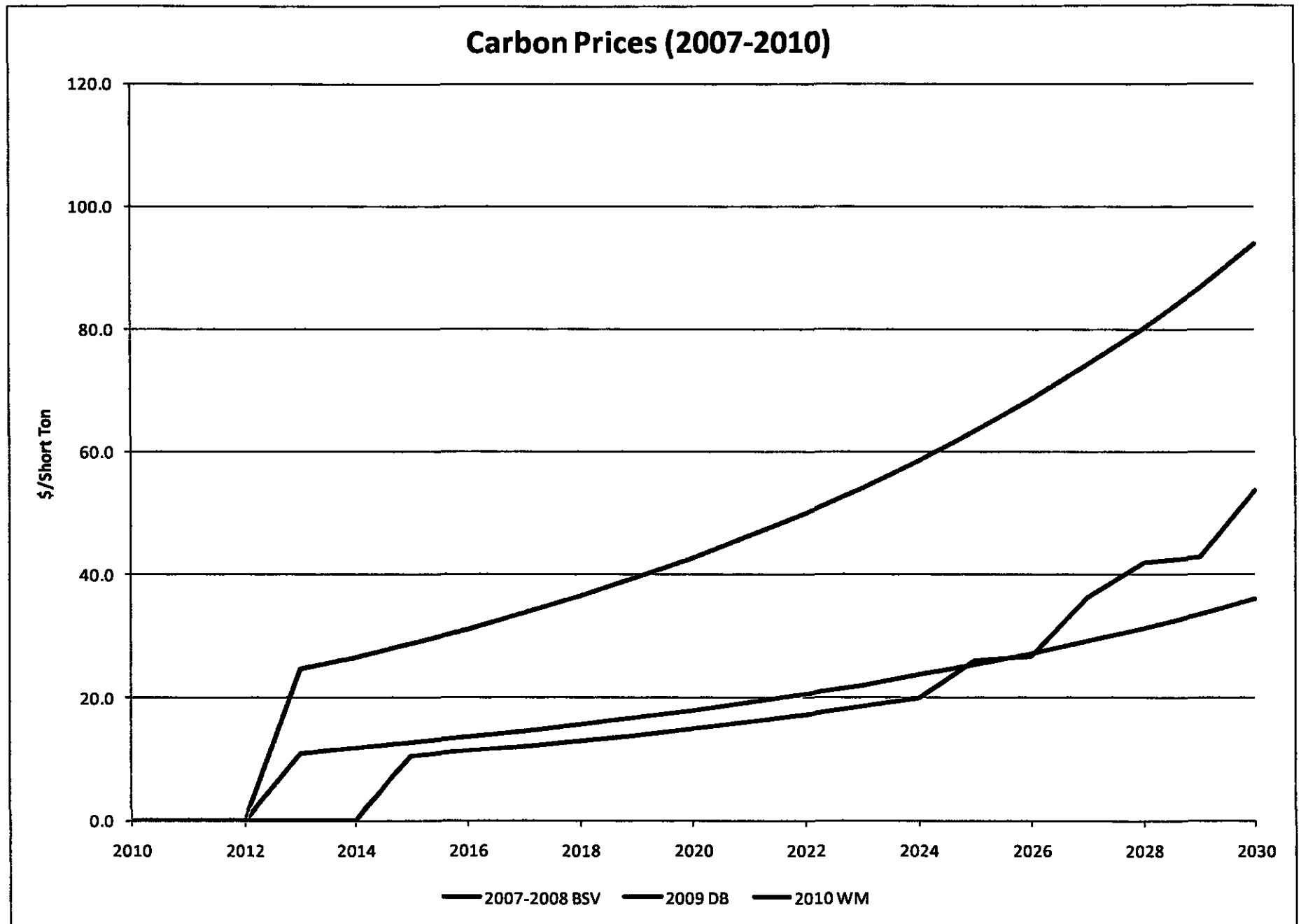
9 **Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

10 A. Yes.

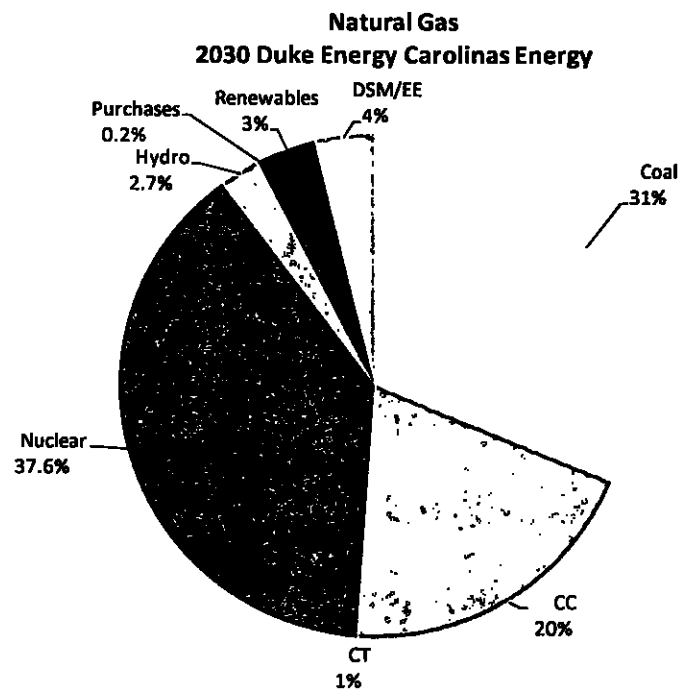
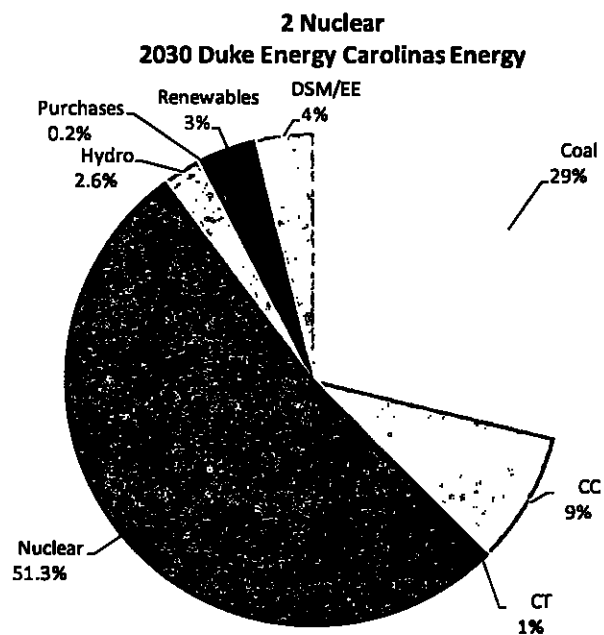
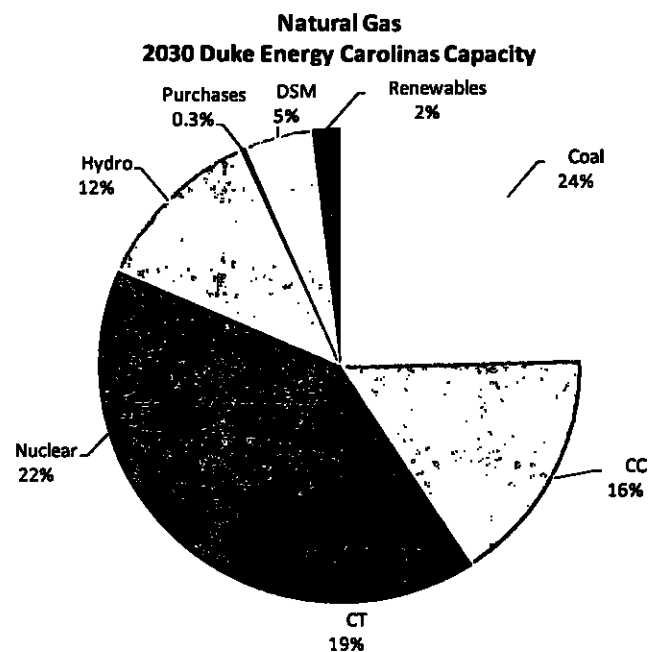
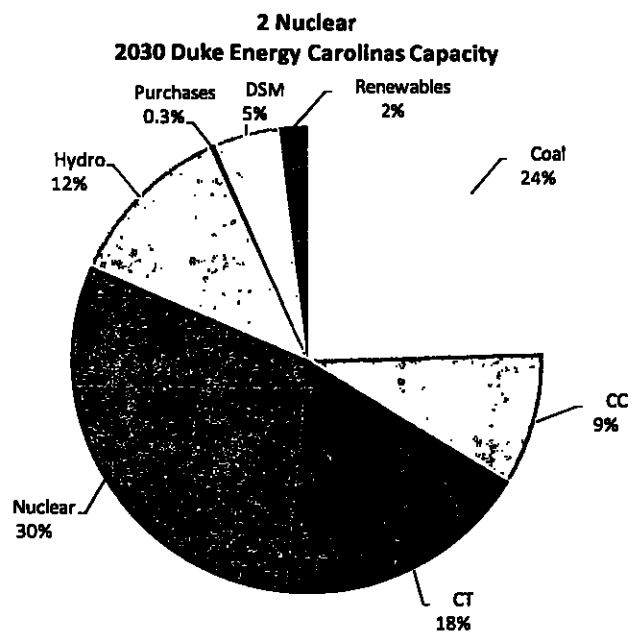
EXHIBIT A

CONFIDENTIAL

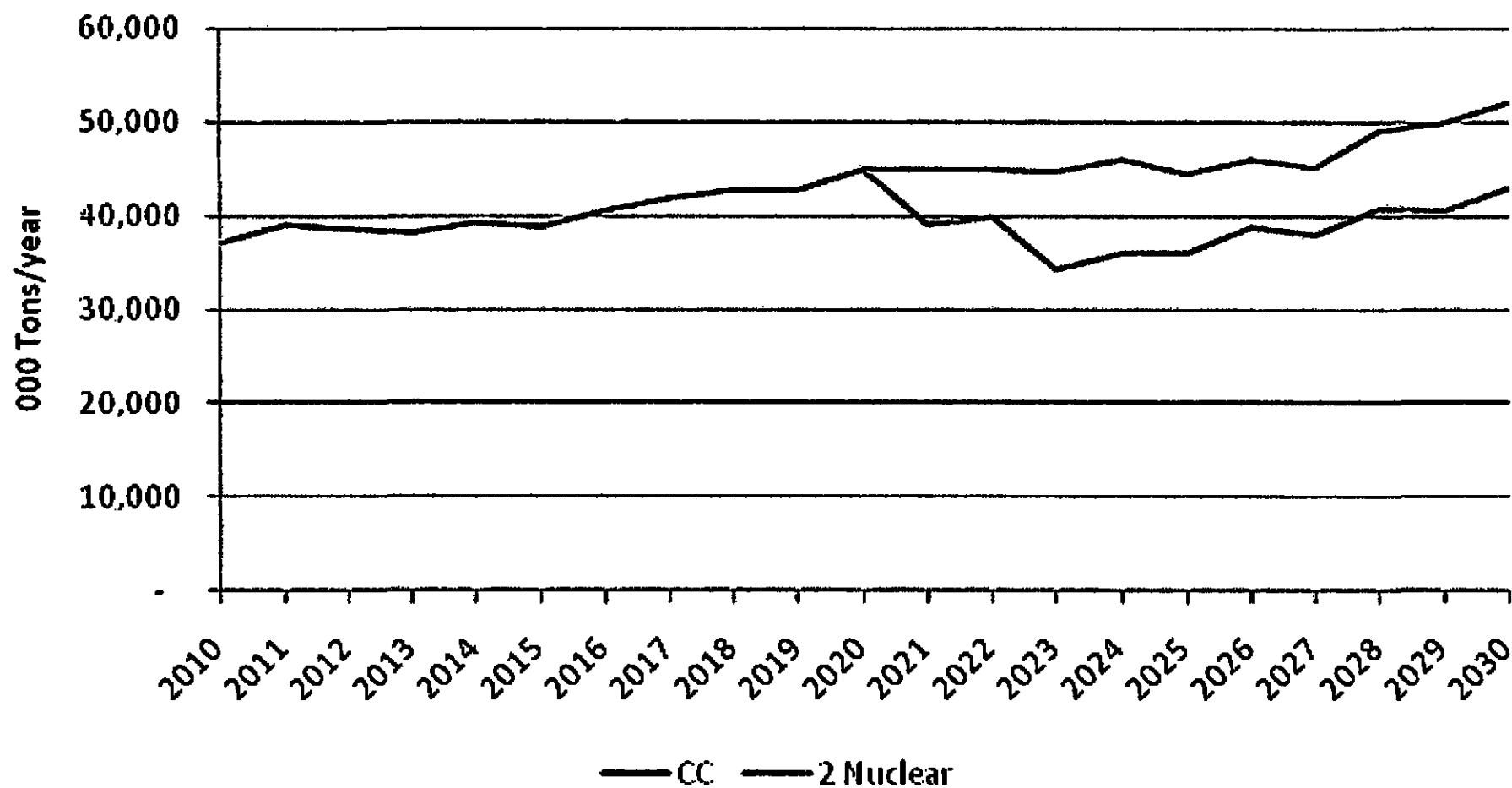
Hager Rebuttal Exhibit B



Hager Rebuttal Exhibit C



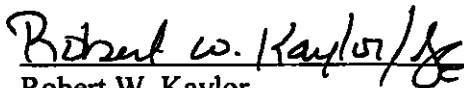
System CO2 Emission Projections



CERTIFICATE OF SERVICE

I certify that a copy of Duke Energy Carolinas, LLC's Rebuttal Testimony of James E. Rogers, Dhiaa M. Jamil, and Janice D. Hager in Docket No. E-7, Sub 819 has been served by electronic mail (e-mail), hand delivery or by depositing a copy in the United States Mail, first class postage prepaid, properly addressed to parties of record.

This the 11th day of March, 2011.

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Robert W. Kaylor

Law Office of Robert W. Kaylor, P.A.

3700 Glenwood Avenue, Suite 330

Raleigh NC 27612

(919) 828-5250

NC State Bar No. 6237