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March 9, 2010

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MAR 09 2010  
Clerk's Office  
N.C. Utilities Commission

Ms. Renne Vance  
Chief Clerk  
North Carolina Utilities Commission  
4325 Mail Service Center  
Raleigh, NC 27600

RE: Docket No. E-100, Sub 124

Dear Ms. Vance:

Please find enclosed for filing in the above-referenced docket the original and 30 copies of Progress Energy Carolinas, Inc.'s ("PEC") Rebuttal Testimonies of witnesses David Christian Edge, David Kent Fonvielle and Glen A. Snider.

Sincerely,

Len S. Anthony  
General Counsel  
Progress Energy Carolinas, Inc.

LSA:mhm

Enclosure

STAREG894

Progress Energy Service Company, LLC  
P.O. Box 1551  
Raleigh, NC 27602

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STATE OF NORTH CAROLINA  
UTILITIES COMMISSION  
RALEIGH

DOCKET NO. E-100, SUB 124

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

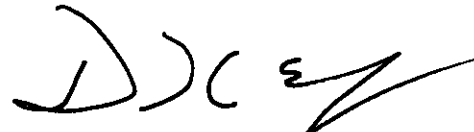
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In the Matter of

Investigation of Integrated Resource )  
Planning in NC 2009 )

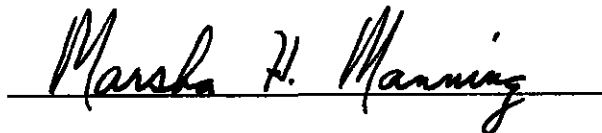
**VERIFICATION AND  
SIGNATURE**

PERSONALLY APPEARED before me, David Christian Edge, who, after first being duly sworn, said that he is the Manager – Retail Customer Strategy with Progress Energy Carolinas, Inc. ("PEC"), and as such is authorized to make this Verification that the facts contained in the attached Rebuttal Testimony are true and accurate.



David Christian Edge

Sworn to and subscribed before me,  
this the 9th day of March, 2010.



MARSHA H MANNING  
NOTARY PUBLIC  
WAKE COUNTY, NC  
My Commission Expires 10-3-2014

STATE OF NORTH CAROLINA  
UTILITIES COMMISSION

DOCKET NO. E-100, SUB 124

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

**FILED**

**MAR 09 2010**

Clerk's Office  
N.C. Utilities Commission

In the Matter of	)	
	)	
Investigation of Integrated Resource	)	<b>REBUTTAL TESTIMONY OF</b>
Planning in North Carolina – 2009	)	<b>DAVID CHRISTIAN EDGE</b>
	)	<b>ON BEHALF OF CAROLINA</b>
	)	<b>POWER AND LIGHT COMPANY</b>
	)	<b>D/B/A PROGRESS ENERGY</b>
	)	<b>CAROLINAS, INC.</b>

1    **Q.    Mr. Edge, please state your full name for the record.**

2    **A.    My name is David Christian (Chris) Edge.**

3    **Q.    Have you previously filed direct testimony in this proceeding?**

4    **Y.    Yes.**

5    **Q.    What is the purpose of your Rebuttal Testimony?**

6    **A.    The purpose of my Rebuttal Testimony is to address the recommendation**  
7           **provided by Witness John D. Wilson that PEC should consider a resource**  
8           **plan with energy savings impacts of up to 15% by 2024 and Dr. Blackburn's**  
9           **assumption that PEC can enjoy 1.5% annual reductions in electricity usage.**

10   **Q.    Have you reviewed the studies and documents that Mr. Wilson and Dr.**  
11           **Blackburn apparently relied upon to support the above-mentioned**  
12           **savings projections?**

1    **A.**    Yes, I am familiar with and have reviewed most of the studies that are cited  
2           within their respective testimonies.

3    **Q.**    **Do you agree with Mr. Wilson's statement within his testimony that**  
4           **"Low electricity rates are simply not a barrier to energy efficiency"?**

5    **A.**    No. PEC is a cost-based regulated electric utility, therefore, electricity rates  
6           are a direct reflection of costs. Avoided costs are the core component for  
7           determining the cost effectiveness of energy efficiency investments in each  
8           of the key economic tests: Total Resource Cost (TRC), Utility Cost (UC),  
9           and Rate Impact Measure (RIM). Additionally, electricity rates are a direct  
10          component of the Participant Test, the remaining economic test for  
11          determining cost effectiveness. Thus, electricity rates are an essential factor  
12          for determining, projecting, and achieving cost-effective energy efficiency.  
13          Mr. Wilson cites a 2009 ACEEE paper allegedly supporting his dismissal of  
14          the importance of electricity rates. However, he fails to note that this same  
15          report stated the following: "it is true that the very highest savings levels  
16          thus far have been in a couple of states with very high electricity rates." The  
17          fact of the matter is, the lower a state's electricity rates, the fewer the  
18          number of energy efficiency measures and programs that are cost effective.  
19          Furthermore, low electric rates also provide less encouragement for  
20          customers to participate in energy efficiency programs.

1   **Q.   Do you agree with Mr. Wilson’s approach for developing energy savings**  
2       **impacts of up to 15% by 2024?**

3   **A.   No.  It appears that Mr. Wilson’s proposal is based upon the “goals and**  
4       **demonstrated savings of other utilities around the country.”**

5           Throughout his testimony, Mr. Wilson cites a variety of studies to  
6       support his recommended savings impact; however, no one study uses a  
7       valid approach for projecting a potential achievable energy efficiency  
8       savings impact that is specific to PEC’s service territory.  Some of the  
9       studies only project economic potential.  Other studies attempt to measure  
10      achievable potential, but with overstated Net/Gross impacts that fail to  
11      ignore the impacts of “free-riders.”  Some studies are national in scope  
12      versus others that are regional.  Some of the studies are not a bottoms-up  
13      study at all, but rather a meta-analysis, or average of other studies.  In  
14      addition, the projected impacts of some of the studies also rely on a  
15      spectrum of policy implementations beyond just utility administered  
16      programs.  For example, they may also include the effects of more stringent  
17      building codes and appliance standards, new transportation policies, federal  
18      tax incentives, etc.  These external sources should not be considered in  
19      determining the realistic level of savings achievable by PEC.

1           In addition, all of the studies cited by Mr. Wilson fail to recognize the  
2           opt-out provision contained in North Carolina's Senate Bill 3 and North  
3           Carolina Utilities Commission (NCUC) rules as it relates to utility  
4           administered energy efficiency (EE) and demand-side management (DSM)  
5           programs. The opt-out provision represents a major factor affecting the  
6           potential for utility EE/DSM programs to achieve savings within the  
7           commercial and industrial market segments. Mr. Wilson does not recognize  
8           this issue or attempt to account for it in developing his 15% by 2024 savings  
9           projection.

10   **Q. Do you believe Mr. Wilson's 15% savings target or Dr. Blackburn's**  
11   **1.5% annual target are achievable through cost effective EE/DSM**  
12   **resources?**

13   **A.** No. I think it is overly optimistic to assume that the very high market  
14           penetration rates required to reach those targets can be achieved in a cost-  
15           effective manner. This is especially true in the commercial and industrial  
16           market segments that are subject to the opt-out provision. In addition, new  
17           government initiatives to stimulate energy efficiency through improved  
18           building codes, increased appliance efficiency standards, new technology  
19           R&D, tax credits, and incentive programs all effectively reduce the savings  
20           potential for utility administered programs.

1   **Q.    Should Mr. Wilson’s savings projection be considered for PEC resource**  
2       **planning purposes?**

3   **A.    Absolutely not.  PEC should not modify its resource planning process to**  
4       include arbitrary demand-side resource impacts based solely on the  
5       aspirational goals of other states around the country.  Rather, PEC should  
6       continue to rely upon the comprehensive analysis of EE and DSM program  
7       opportunities that lie within its Carolinas’ service territory, combined with  
8       the experience gained through the actual implementation and evaluation of  
9       programs.

10   **Q.   Has PEC conducted a comprehensive analysis of achievable energy**  
11       **efficiency potential within its service territory?**

12   **A.    Yes.  Contrary to using an approach that derives the market potential from**  
13       averaging other studies, PEC contracted with ICF International, an industry  
14       leader in the design, implementation, market assessment and evaluation of  
15       EE and DSM programs, to perform a comprehensive analysis of the cost-  
16       effective, achievable potential across PEC’s service territory.  This study  
17       considered the PEC-specific factors that impact potential savings from utility  
18       administered EE and DSM programs including: demographic and customer  
19       composition, PEC electric rates and avoided costs, known regulatory factors  
20       (i.e. the significant effect of customer opt-out provisions), and other

1 assumptions specific to PEC's service territory. The study was intended to  
2 identify the approximate amount of cost-effective savings that can  
3 realistically be achieved through utility EE/DSM programs within the PEC  
4 service area over an extended period of time (and under a stated set of  
5 assumptions). To that extent, it serves as the foundation for identifying  
6 general areas and programs that might warrant consideration in PEC's  
7 EE/DSM portfolio.

8 **Q. What were the conclusions of the ICF EE/DSM potential study?**

9 **A.** The study concluded that approximately 1,020 MWs and 2,094 GWhs are  
10 cost-effectively and reasonably achievable in the PEC service area over the  
11 next 15-years. This accounts for the anticipated effect of large commercial  
12 and industrial customers opting-out of the programs. The study also  
13 concluded that these estimates are suitable for use in long-range system  
14 planning models and integrated resource planning, and serve as a foundation  
15 for identifying general areas and programs that might warrant further  
16 analysis.

17 **Q. How is PEC progressing in evaluating and possibly offering the**  
18 **EE/DSM programs identified by the ICF study?**

19 **A.** Over the past two years PEC has developed, and gained Commission  
20 approval of numerous new EE and DSM programs identified within the ICF



1 potential study. For example, PEC's CIG Energy Efficiency program  
2 includes both prescriptive and custom components that essentially cover all  
3 feasible cost-effective non-residential measures. Since the time the ICF  
4 potential study was completed in March 2009, PEC has filed for  
5 Commission approval four additional new programs, including Residential  
6 Lighting, Neighborhood Energy Saver (Low-Income), CIG Demand  
7 Response and Appliance Recycling. To date, all but the latter have been  
8 approved by the Commission, and the Appliance Recycling program will be  
9 addressed by the Commission on March 15, 2010. All approved programs  
10 are currently being offered to customers. Additionally, PEC is currently  
11 developing and planning to file a residential behavioral change program that  
12 was also identified as an opportunity within the ICF potential study.

13 **Q. Why does PEC consider the ICF study confidential?**

14 **A.** PEC only considered the Appendix to the ICF Potential Study to be  
15 confidential, not the entire study. The Appendix was originally determined  
16 to be confidential because it contained individual measure data derived from  
17 a separate proprietary study, and that data was the intellectual property of  
18 parties other than PEC. However, after further review, PEC has determined  
19 that the Appendix does not specifically identify the source information from

1 that study and is willing to make the study and Appendix available to any  
2 interested party upon request in the future.

3 **Q. Should the demand-side resource projections contained in PEC's IRP**  
4 **be based solely on a market potential study?**

5 **A.** No. I stated earlier that a comprehensive analysis should be "combined with  
6 the experience gained through the actual implementation and evaluation of  
7 programs." There are many risks and uncertainties associated with energy  
8 efficiency resources, and they should be carefully considered when  
9 incorporating long-range program impacts into an integrated resource plan.

10 Mr. Wilson appears to agree that this is the case because in his Exhibit 5 he  
11 states:

12 "Energy efficiency resources are different because in three  
13 critical ways. Energy savings or conservation resources cannot  
14 be controlled or stored in the same way that conventional  
15 supply-side resources can be managed. Second, energy  
16 efficiency impacts cannot be measured in the same way that  
17 supply-side resources can be metered at the plant and customer  
18 site. Third, energy efficiency resources are typically delivered  
19 by a service provider network and customer base that is far  
20 more diverse and complex than the contractors who assist  
21 utilities in building and maintaining power plants. In a utility  
22 resource plan, these differences must be considered when  
23 assessing the uncertainties and risks associated with energy  
24 efficiency resources."

25  
26 These differences between EE/DSM resources and traditional supply  
27 side resources are important, as they greatly affect a utility's ability to ensure

1 reliable service to its customers.. If an EE/DSM resource does not achieve  
2 its projected impact, penetration, or sustainability, the utility will have to  
3 quickly replace it with another resource; otherwise, reliability will be  
4 impaired. This issue has to be considered in a utility's resource planning  
5 process.

6 There is also no substitute for actual program experience when trying  
7 to learn and understand the impacts, risks, and uncertainties associated with  
8 any given EE program. In fact, in Exhibit 5 to his testimony, Mr. Wilson  
9 describes "one technique that leading energy efficiency programs use to  
10 address these barriers is to ramp up gradually over time as the program  
11 builds success in overcoming customer and market barriers such as lack of  
12 information." He further explains that "The ramp up approach is also  
13 needed because the actual capacity of a demand-side resource is only  
14 discovered through effective program execution – potential studies and  
15 industry experience are merely forecasts of actual program results"  
16 (emphasis added).

17 PEC agrees with this approach. Demand-side resource impacts that  
18 get incorporated into PEC's resource plan should be based on a combination  
19 of market analysis and actual experience, with strong consideration to the  
20 risks and uncertainties that are identified within Exhibit 5 of Mr. Wilson's

1 testimony. Establishing an arbitrary value based on the goals of other states  
2 is simply not responsible.

3 **Q. Has PEC requested any participation caps within its approved EE/DSM**  
4 **programs that would limit the achievable impacts of cost-effective**  
5 **energy efficiency across its service territory?**

6 **A. No.**

7 **Q. Does this conclude your Rebuttal Testimony?**

8 **A. Yes.**

**STATE OF NORTH CAROLINA  
UTILITIES COMMISSION  
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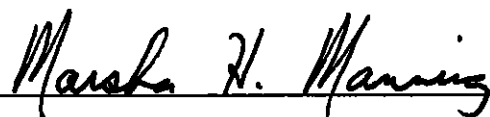
In the Matter of

Investigation of Integrated Resource )	<b>VERIFICATION AND</b>
Planning in NC 2009 )	<b>SIGNATURE</b>

PERSONALLY APPEARED before me, David Kent Fonvielle, who, after first being duly sworn, said that he is the Director – Fleet Optimization with Progress Energy Carolinas, Inc. (“PEC”), and as such is authorized to make this Verification that the facts contained in the attached Rebuttal Testimony are true and accurate.

  
\_\_\_\_\_  
David Kent Fonvielle

Sworn to and subscribed before me,  
this the 9<sup>th</sup> day of March, 2010.

  
\_\_\_\_\_

**MARSHA H MANNING**  
NOTARY PUBLIC  
WAKE COUNTY, NC  
My Commission Expires 10-3-2014

**STATE OF NORTH CAROLINA  
UTILITIES COMMISSION**

**DOCKET NO. E-100, SUB 124**

**BEFORE THE NORTH CAROLINA UTILITIES COMMISSION**

In the Matter of	)	
	)	
Investigation of Integrated Resource	)	<b>REBUTTAL TESTIMONY OF</b>
Planning in North Carolina – 2009	)	<b>DAVID KENT FONVIELLE</b>
	)	<b>ON BEHALF OF CAROLINA</b>
	)	<b>POWER AND LIGHT COMPANY</b>
	)	<b>D/B/A PROGRESS ENERGY</b>
	)	<b>CAROLINAS, INC.</b>

1   **Q.   Mr. Fonvielle, please state your full name for the record.**

2   **A.   My name is David Kent Fonvielle.**

3   **Q.   Have you previously filed direct testimony in this proceeding?**

4   **A.   Yes.**

5   **Q.   What is the purpose of your Rebuttal Testimony?**

6   **A.   The purpose of my Rebuttal Testimony is to provide the Commission with a**  
7       **general sense of the observed prices for solar photovoltaic (solar PV)**  
8       **generation, wind generation, and biomass generation. I also will describe**  
9       **the projected amount of generation, available to PEC, from these resources**  
10      **and the capacity factor of each resource type based on industry data and**  
11      **PEC's direct observations. I will also respond to the assertion by Mr.**

1 Reading, on behalf of CPI USA North Carolina LLC, that PEC's IRP does  
2 not adequately fulfill the requirements and goals of Senate Bill 3.

3 **Q. In general, what range of prices is PEC being offered to purchase solar**  
4 **photovoltaic generation?**

5 **A.** With respect to specific contract prices, PEC is under confidentiality  
6 agreements with a number of counterparties. However, based upon market  
7 data collected through our renewable RFP open since late 2007, and other  
8 direct market observations since that time, solar PV generation prices are in  
9 a range of \$140 per MWh and \$270 per MWh. These prices vary based on  
10 many factors including the size, location, and type of installation, and the  
11 availability of tax credits and grants. Other publicly available data includes  
12 PEC's SunSense Commercial PV program that offers \$180 per MWh for the  
13 electricity and renewable energy credits (RECs), and NC GreenPower's  
14 offer of \$150 per REC, which added to PEC's payment for energy results in  
15 a total payment of approximately \$200 per MWh.

16 **Q. In general, what is the range of prices PEC is being offered to purchase**  
17 **wind generation?**

18 **A.** Since issuing our original renewable RFP in 2007, PEC has received no  
19 proposals for wind development in North Carolina or in the offshore waters  
20 of North Carolina. The only pricing observations for land-based wind

1 turbines were indicative prices ranging from \$82 to \$115 per MWh for wind  
2 generated in West Virginia. These prices did not include costs to deliver the  
3 energy to the PEC system. While PEC has actively engaged in discussions  
4 with a developer in the early stages of exploring wind development in the  
5 offshore waters of North Carolina, we have received no pricing information  
6 associated with their proposed development. One public observation of  
7 offshore wind pricing can be found in power purchase agreements between  
8 Delmarva Power & Light and Bluewater Wind Delaware LLC, filed with the  
9 Delaware PSC on June 23, 2008. Based upon pricing contained in the  
10 document the cost for energy and RECs, assuming a 30% capacity factor,  
11 would be approximately \$168 per MWh in the first year of operation, then  
12 escalating at 2.5% per year thereafter, for an average price of approximately  
13 \$232 per MWh over 25 years. These costs do not take into account the  
14 additional revenue Bluewater would expect to receive from selling the  
15 71.4% of the RECs generated in which they retain ownership. Other public  
16 information on offshore wind brings into question whether the prices for  
17 Bluewater Wind are overly optimistic. In December 2009 National Grid  
18 executed an agreement with Deepwater Wind to purchase the output from  
19 Deepwater Wind's proposed project off the coast of Rhode Island. The  
20 power purchase agreement calls for National Grid to pay \$253 per MWh,



1       escalating 3.5% per year, for 20 years. This results in an average price of  
2       more than \$300 per MWh over the life of the contract.

3   **Q.   In general, what is the range of prices PEC is being offered to purchase**  
4       **biomass generation?**

5   **A.**   Biomass generation encompasses a number of different technologies and a  
6       variety of different fuel sources, including landfill gas, animal waste, wood  
7       waste, and crop residues. Based upon studies of biomass generation and  
8       estimated pricing, such as the La Capra study, and pricing observed by PEC  
9       over more than two years through our renewable RFP, biomass generation  
10      ranges in pricing from \$65 per MWh to \$180 per MWh. These prices vary  
11      based on fuel source, technology, and size of installation.

12 **Q.   How much photovoltaic generation, wind generation and biomass**  
13 **generation is available or can reasonably be expected to become**  
14 **available in North Carolina within the next five to 10 years?**

15 **A.   Solar**

16       As noted by the La Capra Study the technical potential for solar PV is  
17       difficult to assess. What must be considered is the practical potential of solar  
18       PV, given the challenges it faces in cost-effectively and reliably meeting  
19       load and its cost relative to other renewable resources. Based upon the  
20       current cost of solar PV observed by PEC and its limited operational

1 capabilities, I see no reason to anticipate much more solar PV than the  
2 amount required by Senate Bill 3. The one thing that could increase this  
3 amount would be its cost becoming more competitive than other available  
4 renewable resources. While we do not anticipate a sizeable increase in the  
5 amount of solar PV above what is required by Senate Bill 3, PEC has been  
6 very aggressive in the solar market since passage of Senate Bill 3. We  
7 partnered with a developer to build the first 1 MW solar PV farm in North  
8 Carolina on land at our Sutton plant, developed the first standard offer to  
9 purchase RECs to support development of commercial solar thermal  
10 projects, developed the first standard offer contract to purchase the output  
11 from rooftop solar PV installations, and as a result have executed 31  
12 contracts with 17 separate solar developers. The vast majority of these  
13 contracts are with local North Carolina companies. These activities support  
14 the goals of Senate Bill 3 to diversify resources used to meet the state's  
15 energy requirements, use resources indigenous to the state, encourage  
16 private investment in renewable energy, and to improve air quality. A  
17 review of IRP Appendix D, Exhibit 8 (pg. D-14) shows that PEC plans to  
18 have 83 GWhs of solar PV by 2016, which is two years earlier than the  
19 requirements of Senate Bill 3. This level of generation is roughly equivalent  
20 to 60 MWs of solar generation.

## **Wind**

Based upon restrictions on the placement of wind turbines in the North Carolina mountains, PEC does not anticipate utility-scale wind development in western North Carolina during the planning horizon. This assumption has been reinforced through discussions with wind developers over the past couple of years. While there is some gathering interest in the possibility of wind development in the offshore waters of North Carolina, the experience of earlier development activities in Northeastern states where several projects are approaching a decade of development activities with no construction, tempers expectations for North Carolina development. At this time, PEC sees no reason to anticipate the availability of offshore wind within the current planning horizon, based on price, technological hurdles, and permitting difficulties. Therefore, it is not prudent at this time to include wind generation in the REPS Compliance Plan.

## **Biomass**

Biomass generation in North Carolina will primarily come from renewable wood waste, poultry waste, swine waste, and landfill gas. The amount of biomass generation that can be developed, to serve PEC's load and meet the renewable requirements of Senate Bill 3, can be estimated by analyzing the practical amount of fuel available from each source.

1       **Wood Waste:** Using the data compiled by La Capra Associates, numerous  
2       discussions with developers and potential wood suppliers, and third party  
3       studies of availability of renewable wood waste, approximately 300 MWs to  
4       400 MWs of wood-fired generation could be developed to serve PEC's load.

5       **Poultry Waste:** Based on the analysis performed by La Capra Associates  
6       the practical potential for poultry generation is 105 MWs for the entire state  
7       of North Carolina. This is consistent with public plans announced by  
8       Fibrowatt to develop three plants totaling 150 MWs using approximately  
9       65% poultry litter fuel. Since poultry waste is a set aside requirement for all  
10      utilities in the state, the amount of generation available to PEC would be  
11      approximately 35 MWs to 50 MWs.

12      **Swine Waste:** The study conducted by La Capra Associates analyzed the  
13      annual amount of swine waste generated in the state, calculated the amount  
14      of useable methane produced, and arrived at a practical potential of 90 MWs  
15      for the entire state. La Capra estimated that a typical 12,000 head operation  
16      would support 150 kW of generation (80 head/kW). Two other sources of  
17      information that can be used to estimate the potential amount of swine waste  
18      generation that could be available to PEC are proposals received through our  
19      RFP efforts and an evaluation of applications submitted to the North  
20      Carolina Department of Environment and Natural Resources ("NCDENR")

1 in response to Senate Bill 1465. Through PEC's standard renewable RFP  
2 and a special swine RFP issued by PEC in May 2009, PEC has received  
3 proposals totaling approximately 3.5 MWs. An evaluation of applications  
4 submitted pursuant to Senate Bill 1465 indicates 35 swine farms in PEC's  
5 territory with a total of 265,000 head. Using La Capra Associates' estimate  
6 of 80 head per kW, these farms would represent a total generation potential  
7 of 3.5 MWs. PEC is also aware of one proposal that would use waste from  
8 swine processing that could also add several MWs to this potential. Based  
9 upon these direct observations of the market, PEC anticipates 5 MWs to 10  
10 MWs of available swine generation.

11 **Landfill Gas:** La Capra Associates reported a practical potential of 150  
12 MWs of landfill gas generation for the entire state. Based upon PEC's  
13 geographic territory and share of North Carolina's retail load, a good  
14 estimate of landfill gas generation available to PEC is up to 50 MWs. PEC  
15 currently purchases renewable generation from two landfill gas projects  
16 totaling 6.5 MWs. Through our on-going renewable RFP efforts, PEC has  
17 identified other landfill gas generation projects that could provide  
18 somewhere between 15 MWs and 30 MWs of additional generation. We are  
19 actively negotiating with these counterparties and hope to reach final  
20 agreements this year.

1 All of these potential biomass resources, taken together, could provide  
2 an estimated 390 MWs to 510 MWs over time. Based upon observed and  
3 expected capacity factors for each technology, and assuming all of these  
4 resources were dispatched based on their availability not their costs, the total  
5 annual generation capability would be approximately 2.8 million to 3.8  
6 million MWhs. This is roughly equivalent to PEC's 12.5% Senate Bill 3  
7 requirement in 2021 assuming the maximum amount of energy efficiency  
8 that can be credited towards compliance.

9 **Q. Please describe the capacity factors that can reasonably be expected**  
10 **from solar photovoltaic generation, wind generation and biomass**  
11 **generation?**

12 **A.** Capacity factors for solar PV range from 10% to 20%. Data from  
13 installations under contract with PEC show annual capacity factors in the  
14 15% to 20% range. The capacity factor of wind generation is highly  
15 dependent on the wind class where the turbines are sited, the higher the wind  
16 class the higher the resulting capacity factor. Typical capacity factors for  
17 wind generation are 20% to 30%. Both solar and wind generation have  
18 highly intermittent generation profiles based on cloud cover and variability  
19 of wind respectively. Most biomass generation will have relatively high  
20 capacity factors due to the ability to store fuel on site or as a result of a

1 relatively steady stream of in situ fuel in the case of swine waste and landfill  
2 gas. Typical capacity factors can be expected in the range of 70% to 90%.

3 **Q. Do you agree with Mr. Reading's conclusion that PEC's IRP does not**  
4 **adequately fulfill the goals of Senate Bill 3?**

5 A. No.

6 **Q. Please explain.**

7 A. Mr. Reading appears to confuse Table 1 of the IRP (pg. 22), which simply  
8 depicts existing and planned capacity resources necessary to meet the  
9 projected peak load in each year, with PEC's plan to meet our renewable  
10 energy requirement which is outlined in IRP Appendix D, Exhibit 7 (pg. D-  
11 13). While renewable resources that provide firm capacity to the system are  
12 reflected in Table 1, renewable energy certificates with no associated  
13 generation and renewable resources with no firm capacity value are not  
14 shown. Therefore, one cannot possibly evaluate PEC's compliance with  
15 Senate Bill 3 by reviewing Table 1. Mr. Reading does in his testimony  
16 attempt to evaluate IRP Appendix D, Exhibit 7 over an arbitrary period of  
17 2010 through 2016. However, Mr. Reading draws several incorrect  
18 conclusions from his analysis of that period. Mr. Reading's statement that  
19 the out-of-state wind RECs shown account for 17% of the total requirements  
20 through 2016, and that PEC can only purchase an additional 679 GWhs of

1 out-of-state RECs during that period is not a correct or relevant analysis.  
2 The out-of-state RECs shown can be used for compliance through 2018,  
3 which equates to only 9% of the requirement over that period and would  
4 allow PEC to procure an additional 2337 GWhs of out-of-state RECs if  
5 necessary. Finally, based upon his analysis of the arbitrary period 2010  
6 through 2016, Mr. Reading concludes that PEC will need to add 146 MWs  
7 of renewable capacity based upon an assumed 50% capacity factor in order  
8 to be in compliance. If Mr. Reading's analysis was relevant, his assumed  
9 capacity is overstated since many biomass resources operate at significantly  
10 higher capacity factors. However, his analysis is not relevant since PEC does  
11 not have to make decisions today in order to be compliant in 2016.  
12 Development times for green field biomass facilities range from 1 to 3 years.  
13 Being conservative and using a development time of 3 years, PEC would  
14 need to contract for a new resource by the end of this year in order to have  
15 additional renewable generation on-line for 2014. Counting only energy  
16 efficiency projections, contracted purchases, and the ability to use 25% out-  
17 of-state RECs each year, PEC is already compliant through 2013 and would  
18 need to add only 200 GWhs total to be compliant in 2014. For example, this  
19 is only 25 MWs of wood biomass brought on-line in 2014 or as little as 10  
20 MWs of landfill gas brought on-line in 2012.



1    **Q.    Do you agree with Mr. Reading's statement that renewable resources**  
2       **are shown to decline in PEC's resource plan?**

3    A.    No. Mr. Reading in his testimony appears to incorrectly base his conclusion  
4       on renewable resources shown only in Table 1. As previously discussed in  
5       my testimony, not all renewable resources are shown in Table 1. Appendix  
6       D of the IRP provides details regarding PEC's plan to comply with Senate  
7       Bill 3 REPS requirements. Once PEC identifies a specific renewable  
8       resource likely to be added for compliance with Senate Bill 3, which  
9       provides capacity value to the system, that resource will be added to the  
10      capacity resources listed in Table 1.

11   **Q.    Are Mr. Reading's assumptions of 50%, or as low as 30%, average**  
12       **capacity factor for renewable generation a valid assumption?**

13   A.    No. Many biomass resources, such as wood biomass, poultry waste, and  
14       landfill gas, operate at capacity factors between 75% to 90%. Each  
15       proposed Fibrowatt facility or a wood biomass plant of similar size will  
16       produce ~500 GWhs of renewable energy each year.

17   **Q.    Based upon Mr. Reading's testimony and your knowledge of proposals**  
18       **received from CPI USA are their Roxboro and Southport facilities less**  
19       **expensive than any non-set aside resources contracted by PEC to date?**

20   A.    No.

1   **Q.   Based upon your knowledge of recent bids PEC has received for landfill**  
2       **gas and wood biomass facilities are CPI USA's Roxboro and Southport**  
3       **facilities the most cost effective way to meet PEC's renewable**  
4       **requirements over the next several years?**

5   **A.   No. Not based upon the proposals received from CPI USA to date.**

6   **Q.   Does this conclude your Rebuttal Testimony?**

7   **A.   Yes.**

8

STATE OF NORTH CAROLINA  
UTILITIES COMMISSION  
RALEIGH

DOCKET NO. E-100, SUB 124

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION


In the Matter of

Investigation of Integrated Resource  
Planning in NC - 2009

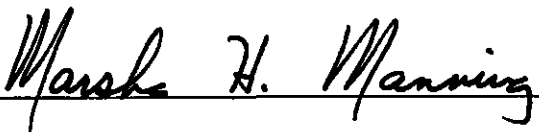
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VERIFICATION AND  
SIGNATURE

PERSONALLY APPEARED before me, Glen A. Snider, who, after first being duly sworn, said that he is the Manager – Resource Planning with Progress Energy Carolinas, Inc. (“PEC”), and as such is authorized to make this Verification that the facts contained in the attached Rebuttal Testimony are true and accurate.

  
Glen A. Snider

Sworn to and subscribed before me,  
this the 9th day of March, 2010.





**STATE OF NORTH CAROLINA  
UTILITIES COMMISSION**

**DOCKET NO. E-100, SUB 124**

**BEFORE THE NORTH CAROLINA UTILITIES COMMISSION**

In the Matter of	)	
	)	
Investigation of Integrated Resource	)	<b>REBUTTAL TESTIMONY OF</b>
Planning in North Carolina – 2009	)	<b>GLEN ALLEN SNIDER</b>
	)	<b>ON BEHALF OF CAROLINA</b>
	)	<b>POWER AND LIGHT COMPANY</b>
	)	<b>D/B/A PROGRESS ENERGY</b>
	)	<b>CAROLINAS, INC.</b>

1    **Q.    Mr. Snider, please state your full name for the record.**

2    **A.    My name is Glen Allen Snider.**

3    **Q.    Have you previously filed direct testimony in this proceeding?**

4    **A.    Yes.**

5    **Q.    What is the purpose of your Rebuttal Testimony?**

6    **A.    The purpose of my Rebuttal Testimony is to address the Public Staff's**  
7       **recommendation that PEC consider utilizing its demand-side management**  
8       **EnergyWise program not only to meet peak demand but also to realize fuel**  
9       **savings. I will also address CPI USA's recommendation that PEC retire its**  
10      **Cape Fear and Weatherspoon coal plants earlier than 2013 and their question**  
11      **with respect to the treatment of purchased power contracts within the 2009**

1       IRP. I will conclude my Rebuttal Testimony with a discussion of the  
2       application of busbar screening curves in the resource selection process.

3   **Q.   Please explain how PEC uses its Energy Wise DSM Program for**  
4       **resource planning purposes.**

5   **A.**   For resource planning purposes, PEC's EnergyWise program is used to  
6       reduce peak demand requirements that would otherwise need to be met with  
7       traditional supply-side resources. Ranges of program utilization under  
8       consideration for the EnergyWise program are all within the classification of  
9       a peaking resource. As such the increased utilization of the program would  
10      not alter the results of the 2009 IRP.

11 **Q.   Do you agree with Mr. Hinton's recommendation that the investor**  
12 **owned utilities continue to investigate increased reliance on air**  
13 **conditioning (A/C) cycling load control as both a capacity resource and**  
14 **as a way of lowering fuel costs?**

15 **A.**   As Mr. Floyd points out in his testimony, PEC's EnergyWise residential  
16       A/C load control program is relatively new. The Commission approved the  
17       program in October 2008 and PEC began implementation in April 2009.  
18       PEC agrees with Mr. Floyd that PEC should be given sufficient opportunity  
19       to determine the optimal use of this resource. Currently, PEC has less than  
20       12 months operating experience with the new program. Much will be

1 learned as customer participation increases and PEC operates the load  
2 control equipment under various conditions, and gains feedback from  
3 participants. Consistent with Mr. Hinton's recommendation, PEC plans to  
4 continue to investigate and evaluate optimal use of the EnergyWise  
5 residential A/C load control program as actual operating experience is  
6 gained with the new program. That ongoing evaluation of the program will  
7 include consideration of potential benefits as a capacity resource and as a  
8 tool to lower fuel costs.

9 **Q. Would it be the least cost option for PEC to retire its Cape Fear and**  
10 **Weatherspoon coal generation units prior to 2013?**

11 **A.** No. These units do not require significant capital investment for  
12 environmental controls prior to 2013 and, at this time, a carbon tax on coal  
13 does not appear likely prior to 2013. Furthermore, retiring Cape Fear and  
14 Weatherspoon prior to 2013 would result in increased fuel costs for PEC's  
15 customers since these units would not be available for economic dispatch.  
16 As such it would not be in the best interest of PEC's customers to retire  
17 these units prior to 2013.

18 **Q. Has there been a change in the assumptions used by PEC for resource**  
19 **planning purposes with respect to the treatment of purchased power**  
20 **contracts from the 2008 IRP to the 2009 IRP?**

1 A. Yes. Prior to 2009 PEC assumed that all longer term purchased power  
2 contracts were perpetually renewed irrespective of the duration of the  
3 existing contract. Starting in 2009 PEC changed this assumption to assume  
4 such contracts expire at the end of their current terms. The following factors  
5 outline the rationale for this change:

- 6 1. PEC has rights to purchased capacity only for the duration of the existing  
7 contract;
- 8 2. At the expiry of an existing purchased power contract the asset owner  
9 may elect to sell the facility's capacity and/or energy to another  
10 purchaser;
- 11 3. At the expiry of an existing purchased power contract the facility may not  
12 be capable of providing reliable power to PEC;
- 13 4. At the expiry of the existing purchase power contract the owner may not  
14 have the financial stability to support a future contract;
- 15 5. At the expiry of an existing purchased power contract it may be  
16 determined that the resource is not the best alternative for PEC's  
17 customers depending on factors such as environmental regulations,  
18 greenhouse gas legislation, competing fuel costs, PEC's future load  
19 forecast etc.; and

1           6. For qualifying facility and renewable contracts the viability of the  
2           underlying asset beyond the contract period can be subject to external  
3           factors such as maintaining tax credits, steam hosts, renewable status and  
4           environmental compliance.

5   **Q.   Was this assumption change applied only to EPCOR's Southport and**  
6   **Roxboro purchased power contracts?**

7   **A.**   No. The assumption change was applied to all PEC purchased power  
8       contracts.

9   **Q.   Various witnesses have used comparisons of levelized costs per MWh,**  
10   **or busbar cost curves, in support of a given resource for inclusion into**  
11   **PEC's resource plan. Can these metrics be used for resource selection?**

12   **A.**   No. Levelized costs per MWh or busbar curves are completely inadequate  
13       and have no relevance in the final selection of resources for inclusion in a  
14       resource plan. Such curves when applied appropriately can be used for  
15       initial screening purposes when comparing like technologies but have no  
16       relevance beyond such use. From a quantitative perspective such  
17       comparisons have the appearance of a consistent cost per MWh basis with  
18       the intuitive selection being the resource with the lower per unit cost. In  
19       practice the most prudent and least cost investment for the customer is often



1 counter to such simple comparisons since such comparisons ignore one or  
2 more of the following parameters:

3 1. Dispatchability of the resource. For example, solar and wind resources  
4 cannot be dispatched in an economic fashion and require backup  
5 generation sources to maintain adequate reliability. Such costs are not  
6 included in simple levelized cost per MWh comparisons. Furthermore,  
7 must-run resources that run based on a need other than utility economic  
8 dispatch can impose a greater cost to the customer by running “out of  
9 economics.” By way of example, if a dispatchable gas fired peaking  
10 resource costs \$70 per MWh and a must run resource costs \$65 per MWh  
11 one might mistakenly conclude that the \$65 per MWh resource is the  
12 most cost effective resource for the customer. Resource planning would  
13 select the peaking unit taking into account the fact that the peaking unit  
14 can be turned on and off based on economic dispatch within the fleet  
15 while the must-run unit may be generating \$65 per MWh power at times  
16 of day when a \$40 per MWh alternative is available.

17 2. The resource need within an existing system. Even if two units have  
18 equal dispatchability capabilities, simple comparisons do not take into  
19 account the need for a particular resource within the existing supply and  
20 demand equation of a utility’s system. For example, utility A might have

1 a supply and demand mix with adequate baseload resources and select a  
2 very high cost per MWh peaking resource while utility B might be in  
3 need of baseload resources and select a lower cost per MWh baseload  
4 resource. The levelized costs and busbar curves of the two resources are  
5 the same for both utilities, yet each selected a different resource based on  
6 its own comprehensive needs.

7 3. Total system cost implications. Levelized cost per MWh and busbar  
8 curves are often expressed in more generic terms for just the generator  
9 and do not include all relevant costs. Prime examples of such costs are  
10 transmission expenses, ancillary service requirements, and impact on  
11 utility specific dispatch.

12 4. Comprehensive risk factors. Simple cost per MWh comparisons fail to  
13 recognize risks such as the maturity of a given technology, long run  
14 viability and security of fuel supply, third party credit risk, regional  
15 acceptance of a technology, etc.

16 **Q. With respect to Mr. Reading's testimony, a levelized cost comparison is**  
17 **made between the Roxboro and Southport facilities and that of PEC's**  
18 **future Wayne County facility. Is this an appropriate comparison?**

19 **A.** No. First and foremost a simple cost per MWh comparison completely  
20 ignores the fact that the Wayne County facility is replacing 397 MWs of coal

1 being retired at the site as part of a comprehensive plan to comply with the  
2 North Carolina Clean Smokestacks Act. As stated in Mr. Reading's  
3 testimony the Roxboro and Southport facilities sum to only 134MWs and  
4 would not be of sufficient size to replace the 400MWs being retired. Even  
5 ignoring this fundamental difference, as stated in the previous response,  
6 simple cost comparisons are often misleading and inappropriate for several  
7 reasons. Specifically, Mr. Reading states "...Wayne County's levelized  
8 busbar cost to be \$147/MWh..." and "an average aggregate cost for the  
9 Roxboro and Southport Facilities is under \$120/MWh." Such a comparison  
10 is misleading. The \$147/MWh is a simplistic representation of the projected  
11 cost of the Wayne County combined cycle over 25 years. It is not clear  
12 what Mr. Reading's \$120/MWh represents, given that he does not indicate  
13 that it is a "levelized cost," it may just represent the cost of the Roxboro and  
14 Southport Facilities in one year. Comparing a representation of 25 years'  
15 worth of costs to a single year's costs is not a valid comparison.  
16 Furthermore the studies are of different vintages as the Wayne County  
17 number is taken from an August 2009 filing which is over six months old.  
18 Because of these differences, and for several other reasons listed in the  
19 previous response, it is inappropriate to compare such numbers.

1   **Q.**    **Does this conclude your testimony?**

2   **A.**    **Yes.**

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**DOCKET NO. E-100, SUB 124**

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of:

Investigation of Integrated Resource       )  
Planning in NC - 2009                               )

**CERTIFICATE OF  
SERVICE**

I, Len S. Anthony, hereby certify that Progress Energy Carolinas, Inc.'s Rebuttal Testimonies of witnesses David Christian Edge, David Kent Fonvielle and Glen A. Snider have been served on all parties of record either by hand delivery or by depositing said copy in the United States mail, postage prepaid, addressed as follows this the 9th day of March, 2010:

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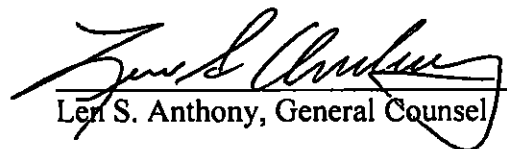
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