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N.C. Utilities Commission*

**NORTH CAROLINA  
PUBLIC STAFF  
UTILITIES COMMISSION**

March 3, 2010

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

RE: Docket No. E-100, Sub 124  
Integrated Resource Planning

Dear Ms. Vance:

On February 19, 2010 the Public Staff filed a confidential version and a redacted version of the affidavit of Jay B. Lucas in the above-referenced docket.

On March 2, 2010 the Public Staff filed revised versions of Mr. Lucas's affidavit, correcting two errors therein.

We have now been requested to revise Mr. Lucas's affidavit further and designate the redactions in a more appropriate manner. We are therefore filing a second revised redacted version of the affidavit.

We apologize for any inconvenience caused by these revised filings. Please do not hesitate to contact me if you have any questions concerning this matter.

Yours very truly,

Robert S. Gillam  
Staff Attorney

RSG/bl

cc: Parties of Record

Executive Director  
733-2435

Communications  
733-2810

Economic Research  
733-2902

Legal  
733-6110

Transportation  
733-7766

Accounting  
733-4279

Consumer Services  
733-9277

Electric  
733-2267

Natural Gas  
733-4326

Water  
733-5610

DOCKET NO. E-100, SUB 124

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of  
Investigation of Integrated Resource  
Planning in North Carolina – 2009

)  
)

AFFIDAVIT OF  
JAY B. LUCAS

STATE OF NORTH CAROLINA

COUNTY OF WAKE

I, Jay B. Lucas, first being duly sworn, do depose and say:

I am an engineer with the Electric Division of the Public Staff – North Carolina Utilities Commission. A summary of my education and experience is attached to this affidavit as Appendix A.

The purpose of my affidavit is to present the Public Staff's position on the alternative supply-side energy resources assessments filed by Carolina Power & Light Company, d/b/a Progress Energy Carolinas, Inc. (PEC); Duke Energy Carolinas, LLC (Duke); and Virginia Electric and Power Company, d/b/a Dominion North Carolina Power (DNCP) as part of their Integrated Resource Planning (IRP) filings in the above docket. My affidavit also presents the Public Staff's position on all three utilities' Renewable Energy Portfolio Standard (REPS) Compliance Plans.

Commission Rule R8-60(i)(7) requires each utility to file an assessment of existing and potential alternative supply-side energy resources. Each utility is also required to provide general information on any changes to the methods and assumptions used in its assessment since its most recent biennial or annual report. Commission Rule R8-60(e) states that alternative supply side energy resources include but are not limited to hydro, wind, geothermal, solar thermal, solar photovoltaic, municipal solid waste, fuel cells, and biomass. All of these resources can be used to meet a utility's REPS requirements.

G.S. 62-133.8 requires all electric power suppliers to provide specified percentages of their retail sales using renewable energy resources or reduce energy consumption through implementation of energy efficiency (EE) measures. Commission Rule R8-67(b) requires electric power suppliers to file a plan on or before September 1 of each year explaining how they will meet the requirements of G.S. 62-133.8(b), (c), (d), (e), and (f). The plans must cover the current year and the next two calendar years, or in this case 2009, 2010, and 2011. The only compliance requirement covered by this planning period is found in G.S. 62-133.8(d) for solar energy resources. Electric power

suppliers must meet 0.02 percent of their retail sales in 2010 and 2011 using solar photovoltaic or solar thermal energy.<sup>1</sup>

Each of the three utilities provided an assessment of alternative supply-side energy resources and a REPS Compliance Plan. A discussion of the actions proposed by each utility and associated concerns is found below.

### **Duke Energy Carolinas, LLC**

Duke is considering bids for the following alternative supply-side energy resources: offshore wind, biomass (wood, poultry, and swine waste), solar photovoltaic (PV), and landfill gas. With respect to offshore wind, Duke has entered the planning phase for one to three large wind turbines in the Pamlico Sound. This project is a result of a study on North Carolina coastal wind energy feasibility by the University of North Carolina at Chapel Hill.

Duke has tested the co-firing of coal mixed with sawdust and wood chips at its Buck Steam Station near Salisbury, but remains concerned that the Department of Environment and Natural Resources (DENR) will regulate sawdust and wood chips as a solid waste. DENR has ruled that many types of wood waste should not be regulated as solid waste, but has reserved the right to evaluate wood wastes on a case-by-case basis. Any additional regulatory oversight of this nature would likely increase the costs of generation. Duke has also tested co-firing of other forestry products mixed with coal at its Lee Steam Station near Williamston, South Carolina. This test was hampered by a mild summer and lower than expected electricity demand, resulting in fewer opportunities for the Lee Station to operate. While these tests have provided valuable information on co-firing, Duke has yet to make a final conclusion or decision on proceeding based upon the results.

Duke is confident that it will meet the 2010 and 2011 solar set-aside requirements by implementing the following projects:

- A 20-year agreement for a large solar farm in Davidson County to be built and operated by SunEdison.
- A Distributed Generation Solar PV Program for which Duke has received Commission approval.
- Long-term agreements to purchase solar renewable energy certificates (RECs) from FLS Energy and Vanir Energy.

For Duke, 0.02 percent of anticipated sales for the solar set-aside equates to 11,142 megawatt-hours (MWh) in 2010 and 11,246 MWh in 2011. Duke projects the following results from its efforts to meet the requirements:

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<sup>1</sup> For 2010, the utilities must supply 0.02% of their 2009 retail sales using solar energy resources. In 2011, they must supply 0.02% of their 2010 retail sales using solar energy resources.



In accordance with Rule R8-67(b)(1)(iv), Duke filed the following projections of sales to its North Carolina retail customers and by the electric power suppliers listed above. It also submitted year-end customer counts by class for each year:

	<b>2009</b>	<b>2010</b>	<b>2011</b>
<b>Total MWh Sales</b>	56,139,461	55,712,059	56,232,640

<b>Number of Customers</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
<b>Residential</b>	1,700,724	1,725,212	1,752,157
<b>Commercial</b>	273,862	278,088	282,931
<b>Industrial</b>	5,346	5,234	5,217

Duke provided the following data on its avoided costs:

<b>Annualized Capacity and Energy Rates (\$ per MWh)</b>	
Variable Rate	64.00
5-Year	63.90
10-Year	64.20
15-Year	65.60

Duke provided information, as required by Rules R8-67(b)(1)(vi) and (vii), on the projected total and incremental costs anticipated to implement its compliance plan for each year, together with a comparison of these costs to the annual cost caps. This information includes its North Carolina retail customers as well as the retail electric customers of the electric power suppliers for which Duke provides resources to meet their REPS requirements. The information provided by Duke is summarized in the following table:

	<b>2009</b>	<b>2010</b>	<b>2011</b>
<b>Total costs</b>	\$8,715,337	\$14,974,549	\$25,407,348
<b>Incremental costs</b>	\$6,771,514	\$4,859,085	\$8,588,219
<b>Annual cost cap</b>	\$32,956,769	\$33,352,593	\$33,850,966

#### **Progress Energy Carolinas, Inc.**

PEC is continuously evaluating the purchase of RECs and electricity from renewable generators, the use of renewable fuels at existing generation facilities, and energy efficiency programs. PEC has considered ownership of renewable generation facilities, but, as yet, has not pursued this strategy due to the lack of cost effectiveness of utility-owned projects, as well as the absence of REPS requirements in the planning period.

In 2009, PEC participated in a small-scale study using torrefied wood as a fuel source either in isolation or mixed with coal. Torrefied wood is waste wood that is

heated in the absence of oxygen, which reduces the moisture content and improves its energy output. PEC partnered with the Electric Power Research Institute (EPRI) to perform this trial of torrefied wood at the Southern Research institute (SRI) facility in Birmingham, Alabama. PEC considers the test to have been successful, but has been unable to find a large scale supplier of torrefied wood for its own use.

PEC has a continuously open bidding process for the purchase of RECs or renewable energy. As of September 2009, PEC has received bids from renewable energy generators for 25 projects, including wind, hydro, landfill gas, biomass, solar photovoltaic, and solar thermal, for the purchase of bundled energy and RECs. PEC has also purchased unbundled wind RECs.

In addition to the aforementioned bids for solar projects, PEC has implemented its SunSense program to comply with the solar set-aside requirements in G.S. 62-133.8(d). Under the SunSense program, commercial customers agree to install rooftop-mounted solar PV facilities, or solar thermal water heating facilities, on their property. PEC agrees to purchase the power generated at the solar PV facilities at a rate of 18 cents per kilowatt-hour over a period of 20 years, and to purchase the solar thermal RECs produced by the water heating systems at a rate of \$20 per REC. PEC also intends to offer rebates to residential customers who install solar PV equipment. The SunSense program has no termination date and aims to add 6 MW per year of customer-owned solar PV to PEC's grid.

For PEC, 0.02 percent of anticipated sales for the solar set-aside equates to 7,517 MWh in 2010 and 7,628 MWh in 2011. PEC projects the following results from contracts for solar energy resources:

**\*\*\*BEGIN CONFIDENTIAL\*\*\***

**\*\*\*END CONFIDENTIAL\*\*\***

The contracts for solar RECs listed above will meet PEC's requirements for 2010 and 2011.

If PEC achieves its goal of adding 6 MW of solar PV per year and finalizing current contract proposals, then approximately 10,000 solar RECs will be added in 2010 and approximately 23,000 additional solar RECs will be added in 2011.

PEC and other electric power suppliers in the State have had difficulty securing resources to meet the poultry and swine waste set-asides required in G.S. 62-133.8(e) and (f). They have made joint filings with the Commission in Docket No. E-100, Sub 113, and I will discuss this issue later in this affidavit. PEC also intends to utilize new EE resources, as defined in G.S. 62-133.8, to meet a portion of its REPS requirements.

PEC is contractually obligated to secure resources to meet all of the REPS requirements of the following towns that provide retail electric service: Black Creek, Lucama, Sharpsburg, Stantonsburg, and Waynesville.

In accordance with Rule R8-67(b)(1)(iv), PEC filed the following projections of sales to its North Carolina retail customers and to the retail customers of the electric power suppliers listed above. It also submitted year-end customer counts by class for each year:

	<b>2009</b>	<b>2010</b>	<b>2011</b>
<b>Total MWh Sales</b>	37,265,000	37,516,000	38,140,000

<b>Number of Customers</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
<b>Residential</b>	1,097,000	1,107,000	1,117,000
<b>Commercial</b>	178,000	180,000	181,000
<b>Industrial</b>	2,000	2,000	2,000

PEC provided the following data on its avoided costs:

<b>Annualized Capacity and Energy Rates (\$ per MWh)</b>	
2-Year	56.96
5-Year	58.29
10-Year	60.54
15-Year	61.11

PEC provided information, as required by Rules R8-67(b)(1)(vi) and (vii), on the projected total and incremental costs anticipated to implement its compliance plan for each year, together with a comparison of these costs to the annual cost caps. The information includes its North Carolina retail customers as well as the retail customers

of the electric power suppliers for which PEC provides resources to meet their REPS requirements. The information provided by PEC is summarized in the following table:

	<b>2009</b>	<b>2010</b>	<b>2011</b>
Total costs	\$21,400,000	\$24,700,000	\$24,000,000
Incremental costs	\$8,600,000	\$12,700,000	\$12,400,000
Annual cost cap	\$20,800,000	\$21,000,000	\$21,200,000

### **Dominion North Carolina Power**

DNCP owns and operates an 83-MW power plant in Hurt, Virginia, that is capable of using biomass, typically waste wood, as its sole fuel source. It is also constructing the 585-MW Virginia City Hybrid Energy Center near Wise, Virginia, which can use up to 20 percent biomass as a fuel source. DNCP has applied for federal stimulus funds for researching carbon capture and sequestration at this site.

DNCP is monitoring the following alternative supply-side energy resources: coal-fired integrated gasification combined cycle (IGCC) technology, fuel cell, solar photovoltaic, solar thermal, tidal and wave power, and wind.

High costs and uncertain efficiency have caused DNCP not to pursue IGCC. Fuel cell technology has not proven effective for utility-scale operation. DNCP ruled out tidal and wave power because no applications are commercially available. DNCP views wind energy as having potential, but does not yet have sufficient information on wind energy's viability in its service territory.

DNCP intends to purchase solar RECs to meet the set-aside requirements for 2010 and 2011, but will obtain bundled solar energy if necessary. For DNCP, 0.02 percent of anticipated sales for the solar set-aside equates to 757 MWh in 2010 and 753 MWh in 2011. DNCP's plan to purchase solar RECs should be sufficient to meet its requirements for 2010 and 2011 since G.S. 62-133.8(b)(2) allows DNCP to purchase all necessary RECs from outside of North Carolina.

DNCP did not mention any difficulty in meeting the poultry and swine waste set-asides in its REPS Compliance Plan. However, it is a party to joint action regarding these set-asides filed by several electric power suppliers in Docket No. E-100, Sub 113. I will discuss this issue later in this affidavit.

DNCP plans to utilize EE to meet a portion of its REPS requirements, and the Public Staff expects DNCP to request NCUC approval of several EE programs sometime in 2010.

In accordance with Rule R8-67(b)(1)(iv), DNCP filed the following projections of sales to its North Carolina retail customers. It also submitted year-end customer counts by class for each year:

	<b>2009</b>	<b>2010</b>	<b>2011</b>
<b>Total MWh Sales</b>	3,784,952	3,765,334	3,890,513

<b>Number of Customers</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
<b>Residential</b>	102,540	103,391	104,537
<b>Commercial</b>	18,335	18,537	18,758
<b>Industrial</b>	61	59	58

DNCP provided the following data on its avoided costs:

<b>Annualized Capacity Rates (\$/kW-Year) and Energy Rates (\$/MWh)</b>		
	<b>2010</b>	<b>2011</b>
<b>On-Peak</b>	65.47	65.10
<b>Off-Peak</b>	48.91	47.24
<b>Capacity</b>	52.63	49.93

DNCP provided information, as required by Rules R8-67(b)(1)(vi) and (vii), on the projected total costs anticipated to implement its compliance plan for each year, with a comparison of these costs to the annual cost caps. The information provided by DNCP is summarized in the following table:

	<b>2009</b>	<b>2010</b>	<b>2011</b>
<b>Total costs</b>	\$0	\$17,663	\$26,355
<b>Incremental costs</b>	\$0	\$17,663	\$26,355
<b>Annual cost cap</b>	N/A	\$1,990,260	\$2,012,270

DNCP's incremental costs are the same as its total costs because it intends to purchase solar RECs that are not bundled with energy to meet its REPS requirements.

### **Swine and Poultry Waste Set-Asides**

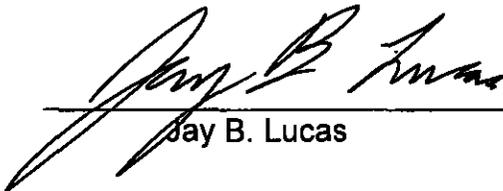
On August 14, 2009, several electric power suppliers including Duke, PEC, and DNCP (Joint Movants) filed a motion requesting that the Commission delay and reduce the poultry waste set-aside requirement and delay the swine waste set-aside requirement. Numerous parties filed comments opposing the Joint Movants' request. On December 16, 2009, the Joint Movants withdrew their request regarding poultry waste, stating that they had resolved their primary issues with the State's poultry waste generators. On January 29, 2010, the Joint Movants, together with several parties interested in generating power from poultry and swine waste, requested Commission approval of an RFP for swine waste generation. On February 5, 2010, several electric power suppliers and other interested parties jointly filed for approval of an allocation method for the poultry and swine waste set-asides. Under G.S. 62-133.8 these two set-asides are designated as aggregate requirements for all electric power suppliers in the State. These proposals are currently before the Commission for consideration in its rulemaking docket, Docket No. E-100, Sub 113.

**Conclusion**

The Public Staff believes Duke, PEC, and DNCP can meet their REPS requirements for the time period covered by their REPS Compliance Plans (2009, 2010, and 2011). The only requirement for this period is that 0.02 percent of North Carolina retail sales must be met with solar photovoltaic or solar thermal energy.

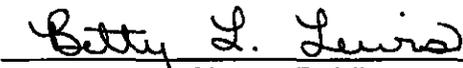
In their initial plans filed in September 2009, Duke and PEC anticipated having difficulty meeting the poultry and swine waste set-asides that take effect in 2012. However, since their filings, they have taken significant steps towards resolution of this problem.

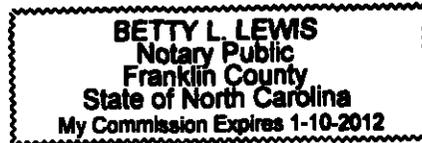
This completes my affidavit.

  
\_\_\_\_\_  
Jay B. Lucas

Sworn to and subscribed before me

this the 3<sup>rd</sup> day of March, 2010.

  
\_\_\_\_\_  
Notary Public



My Commission Expires: 1-10-2012

Jay B. Lucas

I graduated from the Virginia Military Institute in 1985, earning a Bachelor of Science Degree in Civil Engineering. I also graduated from the Virginia Polytechnic Institute and State University in 1991, earning a Master of Science degree in Environmental Engineering. I have 24 years of engineering experience and, since joining the Public Staff in January 2000, have worked on utility rate cases, new program applications, customer complaints, and other aspects of utility regulation. I am a licensed Professional Engineer in North Carolina.