

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

OFFICIAL COPY

June 11, 2010

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

**FILED**  
**JUN 11 2010**  
Clerk's Office  
N.C. Utilities Commission

RE: Docket Nos. E-100, Sub 118 and E-100, Sub 124

Dear Ms. Vance:

Enclosed for filing are the original and thirty (30) copies of Duke Energy Carolinas, LLC's Proposed Order in the above referenced dockets.

Also enclosed is the Proposed Order on CD in Microsoft Word format.

Sincerely,

*Robert W. Kaylor*  
Robert W. Kaylor

Enclosures

cc: Parties of Record

mt  
Full  
Dist.

✓Emerson

STATE OF NORTH CAROLINA  
UTILITIES COMMISSION  
RALEIGH

DOCKET NO. E-100, SUB 118

DOCKET NO. E-100, SUB 124

**FILED**

**JUN 11 2010**

Clerk's Office  
N.C. Utilities Commission

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of	)	
Investigation of Integrated Resource	)	<b>DUKE ENERGY CAROLINAS, LLC'S</b>
Planning in North Carolina – 2008 and 2009	)	<b>PROPOSED ORDER APPROVING</b>
	)	<b>INTEGRATED RESOURCE PLANS</b>
	)	<b>AND RENEWABLE ENERGY AND</b>
	)	<b>ENERGY EFFICIENCY PORTFOLIO</b>
	)	<b>STANDARDS COMPLIANCE PLANS</b>
	)	

HEARD: Commission Hearing Room, Dobbs Building  
430 North Salisbury Street, Raleigh, North Carolina  
March 16-18, 2010

BEFORE: Commissioner William T. Culpeper, III, presiding, and Chairman Edward S.  
Finley and Commissioners Susan Raben, Bryan Beatty, and Lorenzo L. Joyner

APPEARANCES:

For Carolina Power & Light Company, d/b/a Progress Energy Carolinas, Inc.:

Len S. Anthony  
General Counsel  
Kendall C. Bowman  
Associate General Counsel  
Progress Energy Carolinas, Inc.  
410 Fayetteville Street  
Raleigh, North Carolina 27602

For Duke Energy Carolinas, LLC:

Lara Simmons Nichols  
Associate General Counsel  
Charles A. Castle  
Senior Counsel  
Duke Energy Corporation  
P.O. Box 1006-EC03T  
Charlotte, North Carolina 28202-1006

Robert W. Kaylor  
Law Office of Robert W. Kaylor, P.A.  
3700 Glenwood Avenue, Suite 330  
Raleigh, North Carolina 27612

For the North Carolina Waste Awareness and Reduction Network:

John D. Runkle  
P.O. Box 3793  
Chapel Hill, North Carolina 27515

For the Southern Environmental Law Center, Environmental Defense Fund, Southern Alliance for Clean Energy and the Sierra Club:

Gudrun Thompson  
Southern Environmental Law Center  
200 West Franklin St, Suite 330  
Chapel Hill, NC 27516

For the North Carolina Sustainable Energy Association:

Kurt Olson  
North Carolina Sustainable Energy Association  
P.O. Box 6465  
Raleigh, North Carolina 27628

For the Capitol Power USA, LLC:

Gray Styers  
Blanchard, Miller, Lewis & Styers  
1117 Hillsborough Street  
Raleigh, North Carolina 27604

For Haywood Electric Membership Corporation, Rutherford Electric Membership Corporation, and Piedmont Electric Membership Corporation:

Charlotte Mitchell  
Blanchard, Miller, Lewis & Styers  
1117 Hillsborough Street  
Raleigh, North Carolina 27604

For the Using and Consuming Public:

Leonard G. Green  
Assistant Attorney General

North Carolina Department of Justice  
Post Office Box 629  
Raleigh, North Carolina 27602-0629

Lucy E. Edmondson  
Staff Attorney, Public Staff  
Kendrick Fentress  
Staff Attorney, Public Staff  
Bob Gillam  
Staff Attorney, Public Staff  
North Carolina Utilities Commission  
4326 Mail Service Center  
Raleigh, North Carolina 27699-4326

BY THE COMMISSION: G.S. 62-110.1(c) requires the North Carolina Utilities Commission (Commission) to "develop, publicize, and keep current an analysis of the long-range needs" for electricity in this State. The Commission's analysis should include the following: (1) its estimate of the probable future growth of the use of electricity; (2) the probable needed generating reserves; (3) the extent, size, mix, and general location of generating plants; and (4) arrangements for pooling power to the extent not regulated by the Federal Energy Regulatory Commission (FERC). G.S. 62-110.1 further requires the Commission to consider this analysis in acting upon any petition for construction. In addition, G.S. 62-110.1 requires the Commission to submit annually to the Governor and to the appropriate committees of the General Assembly the following: (1) a report of the Commission's analysis and plan; (2) the progress to date in carrying out such plan; and (3) the program of the Commission for the ensuing year in connection with such plan. G.S. 62-15(d) requires the Public Staff to assist the Commission in its analysis and plan.

G.S. 62-2(a)(3a) declares it a policy of the State to "assure that resources necessary to meet future growth through the provision of adequate, reliable utility service include use of the entire spectrum of demand-side options, including but not limited to conservation, load management and efficiency programs, as additional sources of energy supply and/or energy demand reductions." G.S. 62-2(a)(10) further provides that it is the policy of the State to promote the development of renewable energy and energy efficiency through the implementation of a Renewable Energy and Energy Efficiency Portfolio Standard (REPS) that will (1) diversify the resources used to reliably meet the energy needs of North Carolina's consumers; (2) provide greater energy security through the use of indigenous energy resources available within North Carolina; (3) encourage private investment in renewable energy and energy efficiency (EE); and (4) provide improved air quality and other benefits to the citizens of North Carolina. To that end, G.S. 62-133.9(c) requires that each electric power supplier to which G.S. 62-110.1 applies shall include an assessment of demand-side management (DSM) and energy efficiency (EE) in its resource plans submitted to the Commission and shall submit cost-effective DSM and EE options that require incentives to the Commission for approval.

To meet the requirements of G.S. 62-110.1 and G.S. 62-2(a)(3a), the Commission conducts an annual investigation into the electric utilities' integrated resource planning (IRP).

IRP is intended to identify those electric resource options that can be obtained at least cost to the ratepayers consistent with adequate, reliable electric service. IRP considers conservation, load management, and other supply-side options in the selection of resource options. Commission Rule R8-60 requires that each of the electric utilities furnish the Commission with a biennial report in even-numbered years that contains the specific information set out in subsection (c) of that Rule. In odd-numbered years, each of the electric utilities must file an annual report updating its most recently filed biennial report. Further, Commission Rule R8-67(b) requires any electric power supplier subject to Rule R8-60 to file a REPS compliance plan as part of its IRP report. Within 150 days after the filing of each utility's biennial report, and within 60 days after the filing of each electric utility's annual report, the Public Staff or any other intervenor may file its own plan or an evaluation of, or comments on, the electric utilities' IRP reports. Furthermore, the Public Staff or any other intervenor may identify any issue that it believes should be the subject of an evidentiary hearing.

**Docket No. E-100, Sub 118**

Biennial reports on the 2008 IRPs (2008 biennial reports) were filed by Carolina Power & Light Company d/b/a Progress Energy Carolinas, Inc. (PEC); Duke Energy Carolinas, LLC (Duke Energy Carolinas); Virginia Electric and Power Company d/b/a Dominion North Carolina Power (DNCP)(collectively, the investor-owned electric utilities); and by the North Carolina Electric Membership Corporation (NCEMC) and the four independent electric membership corporations (EMCs); i.e., Piedmont EMC (Piedmont), Blue Ridge EMC (Blue Ridge), Rutherford EMC (Rutherford), and EnergyUnited EMC (EnergyUnited). The 2008 REPS compliance plans were filed by PEC, Duke Energy Carolinas<sup>1</sup>, DNCP, GreenCo Solutions, Inc. (GreenCo)<sup>2</sup>, Halifax EMC (Halifax), and EnergyUnited.

On August 18, 2008, GreenCo requested a waiver of the requirement for each of its member EMCs to file individual REPS compliance plans and permission for it to file a consolidated REPS compliance plan on behalf of its member EMCs. On the same day, NCEMC, Blue Ridge, Piedmont and French Broad requested a waiver of the requirement to file individual REPS compliance plans and permission to have GreenCo file a consolidated REPS compliance plan on their behalf. On August 22 and 25, 2008, Duke Energy Carolinas filed a motion for an extension of time to file its biennial report and REPS compliance plan to November 3, 2008. On August 27, 2008, the Commission granted the requests of GreenCo, NCEMC, Blue Ridge, Piedmont, and French Broad for waiver of the requirement that each member EMC file an individual REPS compliance plan and for permission to file a consolidated report, and granted Duke Energy Carolinas' request for an extension of time to file its biennial report and REPS compliance plan. On August 27, 2008, Rutherford filed a notice with the Commission that its REPS compliance plan would be included in Duke's biennial report and REPS compliance plan. On August 28, 2008, Rutherford filed its biennial report and Halifax filed its REPS compliance

---

<sup>1</sup> Duke's 2008 compliance plan included the REPS compliance plan for Rutherford.

<sup>2</sup> GreenCo filed a consolidated REPS compliance plan on behalf of its members: Albemarle EMC, Blue Ridge, Brunswick EMC, Cape Hatteras EMC, Craven-Carteret EMC, Central EMC, Edgecombe-Martin EMC, Four County EMC, French Broad EMC (French Broad), Haywood EMC (Haywood), Jones-Onslow EMC, Lumbree River EMC, Pee Dee EMC, Piedmont, Pitt & Greene EMC, Randolph EMC, Roanoke EMC, South River EMC, Surry-Yadkin EMC, Tideland EMC, Tri-County EMC, Union Power Cooperative, and Wake EMC.

plan. On August 29, 2008, DNCP and EnergyUnited filed their biennial reports and REPS compliance plans. On September 2, 2008, PEC filed its biennial report and REPS compliance plan. On September 12, 2008, NCEMC, Blue Ridge, and Piedmont filed their biennial reports and NCEMC also filed its Energy Efficiency Potential Study Final Report. On the same day, GreenCo filed the consolidated REPS compliance plan and a motion for a protective order and confidential treatment for information attached to the consolidated report. On September 18, 2008, the Commission granted GreenCo's request for a protective order. On November 3, 2008, Duke Energy Carolinas filed its biennial report and REPS compliance plan. On March 25, 2009, the Public Staff moved that the deadline for the filing of initial and reply comments on the biennial reports be extended. The Commission granted the requested extension of time by order issued March 30, 2009.

In addition to the Public Staff, the following parties have intervened in the 2008 proceeding: the Carolina Utility Customers Association (CUCA); the North Carolina Waste Awareness and Reduction Network (NC WARN); the Carolina Industrial Group for Fair Utility Rates I, II, III (CIGFUR); Fibrowatt, LLC (Fibrowatt); GreenCo; and the North Carolina Sustainable Energy Association (NCSEA). The intervention of the Attorney General is recognized pursuant to G.S. 62-20.

On January 29, 2009, Fibrowatt filed comments regarding the REPS compliance plans. On April 16, 2009, NC WARN filed its initial comments on the biennial reports and a request for evidentiary hearing. On April 24, 2009, initial comments were filed by NCSEA, which were specifically in regard to the REPS compliance plans. Also, on April 24, 2009, the Public Staff submitted its initial comments in the Sub 118 proceeding.

On May 27, 2009, Duke Energy Carolinas, PEC, DNCP, and the Public Staff filed reply comments. On the same day, NC WARN filed additional comments.

On July 28, 2009, the Commission issued an Order Denying Request for Evidentiary Hearing, Scheduling Public Hearing, and Requiring Public Notice. That Order set the public hearing in Docket No. E-100, Sub 118 for August 31, 2009. On August 12, 2009, NC WARN filed a Motion for Reconsideration and Renewal of Request for Hearing. The public hearing was held as scheduled with six public witnesses in attendance. All six public witnesses testified in regard to REPS compliance plan issues.

#### **Docket No. E-100, Sub 124**

On September 1, 2009, Duke Energy Carolinas, PEC, DNCP, NCEMC, Piedmont, Rutherford, EnergyUnited, and Haywood filed the 2009 updates to the respective 2008 biennial IRPs. Blue Ridge had previously entered into a full requirements power purchase agreement with Duke Energy Carolinas whereby the entire Blue Ridge load is now included in Duke Energy Carolinas' IRP. Also, on September 1, 2009, Duke Energy Carolinas, PEC, DNCP, GreenCo, EnergyUnited, and Halifax submitted 2009 REPS compliance plans.

In addition to the Public Staff, the following parties have intervened in the 2009 IRP proceeding: CIGFUR, CUCA, NC WARN, NCSEA, Nucor Steel-Hertford, Public Works

Commission of the City of Fayetteville, Capital Power USA, LLC (CPI), Southern Environmental Law Center (SELC), the Environmental Defense Fund (EDF), the Southern Alliance for Clean Energy (SACE) and the Sierra Club. The Attorney General filed a Notice of Intervention pursuant to G.S. 62-20.

On October 15, 2009, the Public Staff filed a motion for an extension of time until January 15, 2010 for the Public Staff and other intervenors to file alternative IRP annual reports, evaluations of, or comments on the 2009 IRPs.

### **Consolidated Dockets E-100, Sub 118 and 124**

On October 19, 2009, the Commission issued an order consolidating the dockets for decision, scheduling hearings and requiring public notice of the proceeding in the consolidated dockets. Pursuant to the Commission's *Order on Advance Notice* in Docket No. E-7, Sub 923, Duke Energy Carolinas was additionally required to present revisions to its 2009 IRP as necessary to include information (1) to move the load from the power purchase agreement with Central Electric Power Cooperative, Inc. (Central) out of the undesignated wholesale load amount; (2) to explain the discrepancy between the 130 MW amount stated in the advance notice in Docket No. E-7, Sub 923 and the 150 MW amount shown on the Company's October 21 filing in that docket; (3) to provide the amount of load and projected load for each present wholesale customer, including Central, on a year-by-year basis through the terms of the current contracts, and explain any growth rate projections that differ from the Company's projections for its own retail load; and (4), to the extent any undesignated wholesale load is included in the IRP, to justify the amount shown, on a year-by-year basis, with information, filed confidentially if appropriate, as to potential customers' current supply arrangements and the Company's reasonable expectations for serving such customers.

Additionally, the Commission's *Notice of Decision* in Docket No. E-7, Sub 831, regarding the Company's application for approval of save-a-watt approach, Energy Efficiency Rider and Portfolio of Energy Efficiency Programs, directed Duke Energy Carolinas to update its 2009 IRP to include the most recent and appropriate information regarding its energy efficiency and demand side management goals.

On January 11, 2010, Duke Energy Carolinas re-filed its 2009 IRP with the revisions required by the Commission's Orders in Docket Nos. E-7, Sub 831 and E-7, Sub 923<sup>3</sup>, and prefiled the direct testimony of Robert Mc Murry, Director, Integrated Resource Planning for Duke Energy Carolinas; Richard G. Stevie, Ph.D., Managing Director of Customer Market Analytics for Duke Energy Business Services LLC; James A. Riddle, Manager, Load Forecasting for Duke Energy Business Services LLC; and Owen A. Smith, Managing Director, Managing Director, Renewable Strategy & Compliance for Duke Energy Corporation.<sup>4</sup> On February 19, 2010, Public Staff filed the affidavits and testimony of John R. Hinton, Kennie D. Ellis, Jack L. Floyd, and Jay B. Lucas; NC WARN filed the testimony of John O. Blackburn; and SELC, EDF, SACE, and the Sierra Club (the Environmental Intervenors) filed the direct

<sup>3</sup> For purposes of this Order, the "2009 IRP" includes the revisions filed with the Commission on January 11, 2010.

<sup>4</sup> Duke Energy Carolinas filed revised pages of Mr. Riddle's and Dr. Stevie's respective prefiled direct testimony on March 9, 2010.

testimony of David A. Schlissel and John D. Wilson. Duke Energy Carolinas then filed rebuttal testimony from Mr. Mc Murry and Dr. Stevie on March 9, 2010.

The public hearing, for the purpose of taking non-expert public witness testimony, was held on March 15, 2010, and 10 public witnesses spoke in support of much greater emphasis on energy efficiency and conservation, and additional development of renewable resources, particularly solar and wind. The witnesses were Michael Thomas Cherin, June Blotnick, Alice Loyd, Elizabeth R. Hutchby, Beth Henry, Miriam Thompson, Bob Rodriguez, Zell McGee, Harry Phillips, and Mary McDowell. Several witnesses provided testimony in opposition to the expansion of nuclear and coal generation.

The evidentiary hearing on the 2009 IRPs and REPS compliance plans of Duke Energy Carolinas, PEC, and Dominion was held from March 16 to 18, 2010. One additional public witness, Ryan William Thompson, was allowed to speak before the parties presented their respective expert testimony. Duke Energy Carolinas presented expert witnesses Robert A. Mc Murry, Dr. Richard G. Stevie, James A. Riddle, and Owen A. Smith to support their respective prefiled direct and rebuttal testimony on Duke Energy Carolinas' 2009 IRP and REPS compliance plan and the Company's compliance with the requirements of Commission Rules R8-60 and R8-67(b). The parties submitted briefs and/or Proposed Orders on June 11, 2010.

#### FINDINGS OF FACT AND CONCLUSIONS OF LAW

1. Duke Energy Carolinas' 2008 and 2009 IRPs are in compliance with the filing requirements of Commission Rule R8-60.
2. The peak and energy forecasts included within Duke Energy Carolinas' 2008 and 2009 IRPs are reasonable, appropriate and comply with R8-60.
3. Duke Energy Carolinas, in compliance with Rule R8-60, conducted reasonable and appropriate forecasts and assessments of supply-side and demand-side resources to meet the projected load and capacity needs over the planning horizons of the 2008 and 2009 IRPs.
4. Duke Energy Carolinas, in compliance with Rule R8-60, performed reasonable and appropriate assessments of cost effective energy efficiency and demand side management programs.
5. Duke Energy Carolinas' target reserve margins within its 2008 and 2009 IRPs are reasonable and appropriate.
6. Duke Energy Carolinas, in its 2008 and 2009 IRPs, provided all information required by R8-60 relating to generating facilities, wholesale power purchase and sale contracts, transmission facilities, alternative supply-side resources and levelized busbar costs.
7. Duke Energy Carolinas' 2008 and 2009 REPS compliance plans are in compliance with the Commission's Rules, are reasonable, and are approved as filed.



8. Duke Energy Carolinas' 2008 and 2009 IRPs are reasonable, prudent and approved as filed.

#### EVIDENCE AND CONCLUSIONS FOR FINDING OF FACT 1

The evidence supporting this finding of fact appears in Duke Energy Carolinas' 2008 and 2009 IRPs, the reply comments of Duke Energy Carolinas in Docket No. E-100, Sub 118, the comments of Public Staff in Docket No. E-100, Sub 118, the testimony of Public Staff witness Ellis, and the general requirements of Commission Rules R8-60.

Duke Energy Carolinas has in its 2008 and 2009 IRPs, responded to all applicable subsections of Rule R8-60(c). The Public Staff also reviewed Duke Energy Carolinas' 2008 and 2009 IRPs and agreed that Duke Energy Carolinas complied with the applicable Commission rules in its filings.

#### EVIDENCE AND CONCLUSIONS FOR FINDING OF FACT 2

The evidence supporting this finding of fact appears in Duke Energy Carolinas' 2008 and 2009 IRPs, the reply comments of Duke Energy Carolinas in Docket No. E-100, Sub 118, the comments of Public Staff in Docket No. E-100, Sub 118, the testimony of Duke Energy Carolinas witnesses Riddle and Stevie, Public Staff witnesses Hinton, and the general requirements of Commission Rules R8-60.

Duke Energy Carolinas used accepted econometric and end-use analytical models to forecast its peak and energy needs in both the 2008 and 2009 IRPs. As with any forecasting methodology, there is a degree of uncertainty associated with these models to the extent that they rely, in part, on assumptions that certain historical trends or relationships will continue in the future. For both the 2008 and 2009 IRPs, the Public Staff reviewed Duke Energy Carolinas' peak and energy forecasts and found them to be reasonable.

The 2008 energy and peak forecasts of Duke Energy Carolinas reflected lower growth rates relative to its annual report from 2007. In Duke Energy Carolinas' original 2008 forecast, it estimated its summer peak to increase at a compound annual growth rate (CAGR) of 1.3%, down from 1.6% in the 2007 annual report, and its winter peak to increase at a CAGR of 1.1%, down from 1.3% in the 2007 annual report. However, pursuant to the terms of the Commission's *Order on Advance Notice and Joint Petition for Declaratory Ruling* in Docket No. E-7, Sub 858 (March 30, 2009), Duke Energy Carolinas removed the load associated with the City of Orangeburg from the load forecast in the 2008 IRP, thereby reducing the forecasted summer peak and winter peak growth rates over the planning period to 1.1% and 0.9%, respectively. The Public Staff's analysis of Duke Energy Carolinas' peak load and energy sales forecasting accuracy showed that the predictions in Duke Energy Carolinas' 2003 annual report were reasonably accurate with less than a 3% forecast error over the last five years.

Based on its assessment, the Public Staff found that Duke Energy Carolinas' load forecast supporting its 2008 IRP was reasonable for planning. Public Staff also found that the economic, weather, and demographic assumptions that underlie Duke Energy Carolinas' peak and energy forecasts are reasonable. The following table summarizes Duke Energy Carolinas' growth rates for its 2008 system peak and energy sales forecasts:

2008- 2028 Retail Growth Rates  
(Including Wholesale Strategy and After New Energy Efficiency and DSM)

	Summer Peak	Winter Peak	Energy Sales	Annual MW Growth
Duke Energy Carolinas	1.5%	1.2%	1.4%	306

In its comments on Duke Energy Carolinas' 2008 IRP, presented through a report entitled "North Carolina's Energy Future", NC WARN alleged that Duke Energy Carolinas' load forecast was overstated, opining that Duke Energy Carolinas' projected growth rates were higher than the actual growth rates experienced in the Carolinas over the past several years due to the protracted national economic recession. NC WARN stated that any actual growth over Duke Energy Carolinas' planning horizon could be met with annual increases in energy efficiency, which it states costs only five to six cents per kilowatt-hour (kWh) and can achieve 15 to 19% reductions in energy use, and acquisitions of renewable energy. NC WARN further alleged that Duke Energy Carolinas' projected demand growth over the planning period could be eliminated completely by removing all wholesale sales from Duke Energy Carolinas' demand, reducing the demand annually through energy efficiency achievements of 1% per year, adding energy purchases from an additional 2400 MW of renewable energy resources, increasing load control, or demand response, measures by over 1200 MW and adding 800 MW of cogeneration on the Company's system.

Duke Energy Carolinas responded to NC WARN's comments by asserting that NC WARN's comments, and supporting report, presented a wholly unrealistic and inaccurate resource plan for the Company. With respect to NC WARN's assertions regarding Duke Energy Carolinas' ability to meet projected demand growth without new generation capacity additions, Duke Energy Carolinas responded to and refuted each component of NC WARN's plan. Duke Energy Carolinas acknowledged that the forecast used to develop the 2008 IRP was developed prior to the current economic recession, but stated that while certainly taking into account current economic conditions, its load forecast typically focuses on "middle of the road" economic conditions. This approach is reasonable given that planning is an on-going process with continual updates to information and that target reserve margins can provide some level of protection for the economic ups and downs.

Duke Energy Carolinas' 2009 peak and energy forecast reflected certain changes in growth from the 2008 forecast resulting primarily from (1) changes in the economic outlook and declining commercial and industrial sales due to the slowing economy; (2) increases in the projections of wholesale electric sales due to the additional of load from the Central Electric Co-Operative and other undesignated load; (3) increased estimates of impacts in energy

efficiency from Duke Energy Carolinas' save-a-watt programs; (4) estimated impacts of federal carbon legislation through a projected increase in electric prices to Duke Energy Carolinas' customers; and (5) positive impacts from the adoption of electric vehicles.

2009 – 2029 Growth Rates

(Including Wholesale Strategy and After New Energy Efficiency and DSM)

	Summer Peak	Winter Peak	Energy Sales	Annual MW Growth
Duke Energy Carolinas	1.8%	1.7%	1.8%	380

Duke Energy Carolinas Witness Riddle testified that Duke Energy Carolinas' load forecast is developed in two steps: first, a service area economic forecast is obtained; second, using the economic forecast, an energy forecast and the summer and winter peak demand forecasts are developed. He explained that the methodology used in the 2008 and 2009 forecasts is the same as that utilized by Duke Energy Carolinas for past plans filed with this Commission and that its models are updated on a regular basis to include the most recent data available. Forecasts are completed as needed to allow adequate time to complete the resource planning work in advance of the IRP deadline.

Mr. Riddle testified that the energy forecast projects the load of Duke Energy Carolinas' major retail customer classes. The projected energy requirements are determined through econometric analysis, which includes the primary factors of the number of customers, the weather, energy prices, and economic activity measures, including employment, industrial production, and income. Mr. Riddle testified that Duke Energy Carolinas' forecast of energy requirements is prepared by using the forecast of the economy in conjunction with the econometric models developed for each customer sector. The forecast of sales then are summed to generate the projection of total delivered load, which includes impacts from line losses. Mr. Riddle further explained that the 2009 load forecast was adjusted to incorporate the impacts from the projected adoption of electric vehicles and to account for known or anticipated changes in wholesale contracts, consistent with the requirements of the Commission's *Order on Advance Notice* in Docket No. E-7, Sub 923.

Mr. Riddle further testified that the impacts from historical conservation energy efficiency programs are reflected in the Duke Energy Carolinas 2009 load forecast. Impacts from existing demand response programs, however, are not reflected in the load forecast; rather the projected impacts of the demand response programs are captured and incorporated in the development of the annual resource plan as an offset to the load forecast. Mr. Riddle also testified that the forecast incorporates the impacts of Duke Energy Carolinas' save-a-watt portfolio of programs, approved by the Commission in Docket No. E-7, Sub 831. Dr. Stevie also clarified that the load forecast captures projected conservation outside of Duke Energy Carolinas' EE programs resulting from rising energy prices.

1

Mr. Riddle also discussed the historical accuracy of Duke Energy Carolinas' forecasts, and found that errors in projected peak loads on a weather-normal basis have averaged only 2.7% average mean error ten years out, with errors on total energy higher at a still reasonable level of 9.0%. Mr. Riddle explained that the higher energy error rate has been driven by the decline in manufacturing in the Carolinas, something hard to predict ten years in advance.

Public Staff Witness Hinton testified that he had thoroughly investigated the validity of Duke Energy Carolinas' peak load and energy forecasts. He found that Duke Energy Carolinas' residential, commercial, and industrial forecasts were reasonable, and that the assumptions and methodologies were sound. Mr. Hinton explained that he had reviewed the utilities' projections of population, personal income, and weather and that these projections were reasonable. He further explained that he examined the regression equations used by Duke Energy Carolinas, and its methods complied with accepted statistical and econometric practices used in forecasting.

Mr. Hinton then reviewed the historical accuracy of Duke Energy Carolinas' forecasts over the years. His review showed that the forecast error associated with Duke Energy Carolinas' forecasts was minimal. He then concluded that Duke Energy Carolinas' forecasts were valid and were reasonable for planning purposes.

NC WARN Witness Dr. Blackburn asserted that he believes electricity demand is likely to grow more slowly than Duke Energy Carolinas projects over the planning period. Dr. Blackburn noted that Duke Energy Carolinas' recent estimate in Docket E-7, Sub 909 showed flat sales growth for the years 2009 through 2014, and he stated that the sales growth projection did not take into account the impact of the recession. He then alleged that Duke Energy Carolinas' forecasts should reflect more aggressive energy efficiency gains that could be realized over the planning period.

In his rebuttal testimony, Dr. Stevie pointed out that Dr. Blackburn's assessment of Duke Energy Carolinas' IRP was flawed in several ways. Dr. Stevie first stated that Dr. Blackburn overlooked the fact that Duke Energy Carolinas' projected growth rates include sales to both retail and wholesale customers. Dr. Stevie also testified that to get a true picture of the projected growth for retail sales, one should rely upon Table 3.1 on page 36 of the Revised 2009 IRP that shows a projected growth rate of 1.0%.

Dr. Stevie then testified that Dr. Blackburn's reference to the exhibit from Docket No. E-7, Sub 909 that projected flat retail sales from 2009 to 2014 similarly overlooked the fact the projected sales numbers within the exhibit reflected projected growth after the forecast had been reduced for the impacts of Duke Energy Carolinas' energy efficiency programs. Dr. Stevie's Rebuttal Exhibit No. 1 provides the forecast of retail sales both before and after the impacts of the energy efficiency programs, and the exhibit reveals that after the inclusion of the energy efficiency programs, retail sales projected for 2014 are below the level for 2009, but without the impacts of energy efficiency are above the level for 2009. Stevie Rebuttal Exhibit No. 1 reveals that the only reason the forecast is flat is due to the impacts of Duke Energy Carolinas' energy efficiency programs.

Dr. Stevie further testified that Duke Energy Carolinas' load forecast does include impacts from the recent recession. According to the National Bureau of Economic Research, which identifies the beginning and end of recessions, the recession began December 2007. Given that this forecast was prepared in 2009, it would have been improper for the Company to ignore the impacts of the recession in preparing this forecast. Based on these flaws in Dr. Blackburn's analysis, Dr. Stevie testified that Dr. Blackburn's comments concerning Duke Energy Carolinas' load growth projections were unfounded.

The Commission thus concludes that the 2008 and 2009 energy and peak load forecasts of Duke Energy Carolinas are reasonable and appropriate. The Commission is unpersuaded by Dr. Blackburn's assertions regarding the projected annual growth rates, and Duke Energy Carolinas' forecasting methodology is well accepted in the industry and it has proven over time to be accurate.

### EVIDENCE AND CONCLUSIONS FOR FINDING OF FACT 3

The evidence supporting this finding of fact appears in Duke Energy Carolinas' 2008 and 2009 IRPs, the reply comments of Duke Energy Carolinas in Docket No. E-100, Sub 118, the comments of Public Staff in Docket No. E-100, Sub 118, the testimony of Duke Energy Carolinas witnesses Mc Murry and Stevie, Public Staff witnesses Hinton, Ellis and Floyd, NC WARN witness Blackburn, SELC witnesses Schlissel and Wilson, and the general requirements of Commission Rules R8-60.

As reflected in Duke Energy Carolinas' 2008 and 2009 IRPs, these plans are the product of a resource planning process that provides Duke Energy Carolinas with a framework to assess, analyze, and implement a cost-effective approach to meet customers' growing energy needs reliably. In addition to assessing qualitative factors, Duke Energy Carolinas conducts a quantitative assessment using a simulation model. A variety of sensitivities and scenarios were tested against a base set of inputs for various resource mixes, allowing Duke Energy Carolinas to better understand how potentially different future operating environments, such as fuel commodity price changes, environmental emission mandates, and structural regulatory requirements can affect resource choices, and, ultimately, the cost of electricity to customers. The results of Duke Energy Carolinas' quantitative analyses in both the 2008 and 2009 IRPs revealed that a combination of additional baseload, intermediate and peaking generation, renewable resources, EE, and DSM programs are required over the next twenty years to meet Duke Energy Carolinas' customer demand reliably and cost-effectively in a carbon-constrained future.

As Duke Energy Carolinas has received certificates of public convenience and necessity from the Commission for the new pulverized coal units at Cliffside Steam Station (Cliffside Unit 6)<sup>5</sup> and the new natural gas combined cycle facilities at the Buck and Dan River Steam Stations<sup>6</sup>,

---

<sup>5</sup> *Order Granting Certificate of Public Convenience and Necessity with Conditions*, Docket No. E-7, Sub 790, dated March 21, 2007.

<sup>6</sup> See *Order Issuing Certificates of Public Convenience and Necessity*, Docket No. E-7, Subs 791 and 832, dated June 5, 2008.

it has incorporated those facilities into the base generation portfolio. In addition, Duke Energy Carolinas included DSM/EE consistent with its energy efficiency plan approved in the Commission's *Notice of Decision*, dated December 14, 2009, and its *Order Approving Agreement and Joint Stipulation of Settlement Subject to Certain Commission-Required Modifications and Decisions on Contested Issues*, dated February 9, 2010, issued in Docket No. E-7, Sub 831 and renewable resources required to meet Duke Energy Carolinas' ongoing annual compliance obligations under the North Carolina REPS. Duke Energy Carolinas' analysis demonstrated that approximately 200 MWs of nuclear up-rates were cost effective in the 2008 IRP and specific projects are being developed to be implemented in the 2012-2016 timeframe. In the near-term, there are no significant additional capacity needs beyond the committed and planned additions listed in its 2008 and 2009 IRPs. However, in 2016 and beyond, Duke Energy Carolinas has definite capacity needs due to annual load growth demonstrated in its load forecasts, existing unit capacity adjustments, unit retirements, existing DSM program reductions, and expirations of existing power purchase agreements. Duke Energy Carolinas' selected portfolio of supply and demand side resources to meet its system needs over the planning period consists of 4,464 MW<sup>7</sup> of new natural gas simple cycle capacity, 2,234 MW of new nuclear capacity, 1,100 MW of Demand-Side Management, 483 MW of Energy Efficiency, and 458 MW of renewable resources.

As approved by the Commission in Docket No. E-7, Sub 819<sup>8</sup>, Duke Energy Carolinas has conducted project development work to evaluate the addition of the proposed William States Lee, III Nuclear Station in Cherokee County, South Carolina. Duke Energy Carolinas' analysis of new nuclear capacity contained in the 2008 and 2009 IRPs focused on the impact of various uncertainties, such as load variations, nuclear capital costs, the impact of greenhouse gas legislation, fuel prices, and the availability of options such as federal loan guarantees, that can help reduce the costs to customers for this carbon-free and other greenhouse gas emission-free base load resource.

With regard to the timeframe for new nuclear capacity, Duke Energy Carolinas' IRP analysis (in 2008 and 2009) provided three key insights: (1) inclusion of new nuclear capacity in Duke Energy Carolinas' resource portfolio results in lower costs to customers (in net present value of revenue requirements) than portfolios without new nuclear capacity; (2) a regional partnership approach — allowing Duke Energy Carolinas and other companies to own partial shares of new nuclear units — would provide additional benefits to customers, if such opportunities arise; and (3) a target Commercial Operation Date (COD) of 2021 for sole ownership of one or two nuclear units by Duke Energy Carolinas is lower cost for customers than a target COD of 2018. In addition to the quantitative analysis showing the advantages of a later COD, a later date allows time for Duke Energy Carolinas to explore further the development of a regional nuclear strategy and to pursue legislation needed to minimize the financing costs ultimately borne by customers. Duke Energy Carolinas will continue to pursue a Combined Operating License from the Nuclear Regulatory Commission for the Lee Nuclear Station.

---

<sup>7</sup> The ultimate sizes of any generating unit may change somewhat depending on the vendor selected.

<sup>8</sup> *Order Approving Decision to Incur Project Development Costs*, Docket No. E-7, Sub 819, dated June 11, 2008.

With respect to Duke Energy Carolinas' forecast and assessment of supply-side and demand-side resources within its 2008 IRP, the Public Staff commented that Duke Energy Carolinas provided information describing its analysis and evaluating resource options as required by Rule R8-60. Public Staff commented that Duke Energy Carolinas used accepted production cost simulation models to assist in the development and evaluation of its resource options in a manner consistent with least cost planning. Public Staff also commented that the projected operating and capital costs used in Duke Energy Carolinas' production models and the evaluation of resource options were conducted in a reasonable manner for purposes of the IRP proceeding.

As noted in the discussion on Duke Energy Carolinas' 2008 IRP peak and energy forecasts above, NC WARN presented its report entitled "North Carolina's Energy Future" to allege that Duke Energy Carolinas did not need any additional supply-side resources to meet future demand as it asserted, that any actual growth over the planning horizon could be met by removing all wholesale sales from Duke Energy Carolinas' demand, and by Duke Energy Carolinas making significant increases in energy efficiency, demand response and cogeneration capacity, along with substantial acquisitions of renewable energy. Duke Energy Carolinas refuted each component of NC WARN's plan, demonstrating that NC WARN's plan was entirely unrealistic and unreasonable in the context of the least cost planning and service reliability requirements of existing North Carolina law and policy.

With respect to the 2009 IRP, Duke Energy Carolinas Witness Mc Murry described the IRP development process and the costs and relative characteristics of resource options, both supply-side and demand-side, to meet future customer needs. He stated that quantitative analyses are conducted to identify combinations of options that will safely and reliably meet customer energy needs (plus reserve margin), which Duke Energy Carolinas forecasts will require approximately 3,280 MW by 2021 and to 7,150 MW by 2029, while minimizing the costs to customers. Mr. Mc Murry testified that 2009 IRP incorporates a target planning reserve margin of 17%, which Duke Energy Carolinas' historical experience has shown to be sufficient based on the prevailing expectations of reasonable lead times for the development of new generation, siting of transmission facilities and procurement of purchased capacity.

Mr. Mc Murry further testified that the 2009 IRP incorporated certain major changes from the 2008 IRP, namely updates to the load forecast, energy efficiency impacts, unit retirements, and nuclear escalation rates. Specifically, the 2009 IRP incorporated the expected impact of greenhouse gas regulation or legislation into the load forecast, reduced the forecasted inflationary impacts on major construction projects, and included decreased contributions from EE programs to peak load based on measurement and verification results in other jurisdictions from programs similar to Duke Energy Carolinas save-a-watt programs. Mr. Mc Murry also noted that the retirement of an additional 625 MW of older coal facilities at Buck and Lee Steam Stations were included, along with accelerated retirement dates for combustion turbine facilities located at Buck, Dan River, Riverbend, and Buzzard Roost Stations.

Mr. Mc Murry testified that projected load impacts for energy efficiency and demand-side resources were developed based on the terms of the settlement approved by the Commission in its *Order Approving Agreement and Joint Stipulation of Settlement Subject to Certain*

*Commission-Required Modifications and Decisions on Contested Issues* in Docket No. E-7, Sub 831. Dr. Stevie also testified that the impacts were updated in accordance with the mandates of the Commission's *Notice of Decision* in the same docket, which required "the information and tables presented in the Company's IRP plan properly reflect the most recent and appropriate information regarding Duke's EE and DSM goals." The conservation impacts from the save-a-watt portfolio were assumed at 85% of the target impacts from the terms of the proposed settlement and the projected load impacts from the conservation programs were based upon three bundles of the save-a-watt portfolio of programs (a new bundle of programs begins every four years). The projected load impacts from the DSM programs are based upon the continuing, as well as the new, demand response programs. Mr. Mc Murry testified that the base case level of DSM/EE accomplishments was cost-effective in the screening stage of Duke Energy Carolinas' analysis and was included in all resource portfolios that were analyzed.

Additionally, Dr. Stevie explained that a high DSM/EE case scenario was also developed, which used the full target impacts of the save-a-watt bundle of programs for the first five years, and then increased the load impacts at 1% of retail sales every year after that until the load impacts reach the economic potential identified by the 2007 market potential study conducted by Forefront Economics. The projected high case level of DSM/EE accomplishments was also cost-effective, however, Mr. Mc Murry emphasized that the cost-effectiveness of the high case scenario required equally aggressive performance from the industrial and residential sectors, which introduced greater risk and uncertainty to the scenario. Mr. Mc Murry testified that the cost-effectiveness of the high case would be compromised very quickly if either the industrial or the residential sector did not perform as required under the high case scenario. Similarly, Dr. Stevie explained that Duke Energy Carolinas is committed to pursuing all cost-effective EE programs, and used the base case in its 2009 IRP because the base case relies upon the cost effective programs that actually exist and have been developed over time for the save-a-watt portfolio.

Public Staff Witness Hinton testified that he had reviewed Duke Energy Carolinas' inputs used in its production cost simulation models to evaluate supply-side and demand-side resource options with respect to the Company's expansion plans. Based on his review, Mr. Hinton testified that he found both Duke Energy Carolinas' inputs used for modeling and its expansion plans to be reasonable for purposes of this proceeding. Mr. Ellis further testified that the reserve and capacity margins demonstrated in Duke Energy Carolinas' IRPs were reasonable. Mr. Floyd testified that the Public Staff has encouraged the utilities, including Duke Energy Carolinas, to find as much cost effective demand response and energy efficiency as possible, and that the Public Staff has spent a lot of time talking with representatives from Duke Energy Carolinas to find cost effective demand-side resource options.

NC WARN Witness Blackburn testified in favor of aggressive programs to increase energy efficiency at a level of 1.5% annual conservation gains and a renewable energy build-up to 20% of total sales, including both retail and wholesale sales in North Carolina, while also recommending the development of substantial cogeneration (combined heat and power) facilities for commercial and industrial customers. Dr. Blackburn's proposal would require 24 billion kilowatt-hours of new annual renewable generation in North Carolina, and would depend upon the development of wind generation in the State, as well as meeting the REPS requirement for



biomass sources, along with new and small hydroelectric facilities.

Dr. Blackburn projected that the solar share of the new renewable development required would be approximately 5000 MW combined within PEC and Duke Energy Carolinas' respective territories, and he acknowledged that it would cost approximately \$20 billion in capital to construct such facilities. Dr. Blackburn also acknowledged that his projections did not take into account the required capacity for reserves for the renewable facilities, and did not consider the additional transmission costs and siting challenges, additional necessary grid stability and voltage control measures, or land use limitations and considerations related to solar and wind resource development. He also agreed that for his proposal to be viable, it would require significant changes to the State's current energy policy and existing laws.

Environmental Intervenor Witness Schlissel testified that due to recent forecasts of supply, and corresponding pricing forecasts, of natural gas, it is a preferable supply-side resource than had previously been thought by utilities. He recommended that Duke Energy Carolinas place greater emphasis on natural gas in its consideration of supply-side resources going forward, however, he did agree that an all-gas future generation expansion plan would not be prudent. Mr. Schlissel also testified that future Environmental Protection Agency regulation of coal combustion by-products and impending federal legislation and/or regulation of greenhouse gas emissions would increase the cost of fossil fuel generation resources, and that the utilities should account for those cost increases in their resource planning. Mr. Schlissel further testified that nuclear resources should be considered as a generation alternative, and that all generation alternatives, including natural gas, renewable resources, and energy efficiency have uncertainties and associated risks related to costs and development.

Environmental Intervenor Witness Wilson testified that while the North Carolina utilities were investing substantial capital in energy efficiency, and North Carolina is stepping forward as the energy efficiency leader in the Southeast, energy efficiency remains a second-class resource for resource planning purposes for the North Carolina utilities. He asserted that the forecasts of energy efficiency during the 15-year resource planning horizon result from a process which fails to consider potential demand-side resource options on an equivalent basis to supply-side resource options.

Mr. Wilson testified that Duke Energy Carolinas has demonstrated its commitment to ramp up its energy efficiency offerings in the Carolinas to levels that will make it a leader in the industry. However, he alleged that specific defects existed in Duke Energy Carolinas' demand-side resource forecast in that it did not include certain details about the programs and the 4-year bundle approach likely understated the impacts that will result from the save-a-watt programs. Mr. Wilson recommended that Duke Energy Carolinas should revise its resource plan to reflect a consistent trend in energy efficiency program growth consistent with available energy efficiency potential and opportunities for reasonable program growth to more adequately reflect the terms of the approved save-a-watt program.

Mr. Wilson also alleged that Duke Energy Carolinas has not conducted a comprehensive analysis of demand-side resource options. He stated that Duke Energy Carolinas' demand-side market potential study, performed by Forefront Economics in 2007, did not consider enough

programs and missed approximately half of the cost-effective energy efficiency potential for residential customers in North Carolina. Specifically, Mr. Wilson pointed out three programs lacking from Duke Energy Carolinas' study that he asserts, alone, could double the energy savings impact forecast: (1) Home Energy Comparison Report, (2) a building re/retro/commissioning program, and (3) various energy recycling technologies, including combined heat and power. He acknowledged that Duke Energy Carolinas did analyze more than one demand-side resource option in its resource planning, but it did so without a comprehensive analysis of energy efficiency options. Mr. Wilson further testified that the linkage between Duke Energy Carolinas' market potential study and the options it considered in its resource plan was not well explained and that Duke Energy Carolinas failed to explain how it selected the base case, its preferred demand-side resource portfolio.

At the hearing, Mr. Wilson acknowledged that he had been participating in Duke Energy Carolinas' energy efficiency planning collaborative and that Duke Energy Carolinas was, in fact, in the process of developing a home energy comparison report program, a residential retrofit program, and a new option for its Power Share load control program. He also agreed that the structure of the save-a-watt settlement would encourage Duke Energy Carolinas to pursue as much cost effective energy efficiency as possible to stay on target with the settlement goals and reach the structured financial incentives. Mr. Wilson further agreed that resource planning requires consideration of many different factors, including energy efficiency, to maintain operational flexibility to meet future needs.

In his rebuttal testimony, Mr. Mc Murry first clarified the additional wholesale-undesigned load in the 2009 IRP, as revised pursuant to the requirement of the Commission's *Order on Advance Notice* in Docket No. E-7, Sub 923, did not create a need for additional baseload resources over and above that called for in the 2009 IRP as filed on September 1, 2009, nor does this additional undesigned wholesale load alone support the need for Lee Nuclear. Mr. Mc Murry testified that both the inclusion of the Central load and the specified undesigned wholesale load increased the need for additional peaking generation within the planning period.

Mr. Mc Murry testified in response to several assertions made by Environmental Intervenor Witness Schlissel. Mr. Mc Murry explained that although it was not explicitly addressed in the 2009 IRP, Duke Energy Carolinas' resource planning analysis accounts for the risks associated with future regulations of CCBs and other pending air quality regulations. He also stated that Duke Energy Carolinas' +/- 15% range for carbon dioxide emission allowance costs was entirely consistent with the provisions of the Waxman-Markey legislation that passed the U.S. House in mid-2009, but acknowledged that it may consider a wider allowance cost range for the 2010 IRP. Additionally, Mr. Mc Murry explained that the construction of Cliffside Unit 6 would not result in higher carbon dioxide emissions from Duke Energy Carolinas' fleet, and would, in fact, after the associated old fleet retirements, impacts of energy efficiency and renewable resource additions, result in a 30% reduction in carbon dioxide emissions system-wide. He also testified that natural gas expansion in lieu of Cliffside would not have reduced carbon dioxide emissions as dramatically, as a new natural gas facility would not have impacted the dispatch order for Duke Energy Carolinas' older coal facilities.

Mr. Mc Murry also responded to the testimony of Dr. Blackburn by stating that it would

not be prudent for Duke Energy Carolinas to create a complete resource plan that is not supported by state energy policy and law. He similarly testified that Duke Energy Carolinas will include additional renewable energy resources in its portfolio beyond that required by REPS, but only to the extent those renewable energy resources become cost effective as compared to traditional generation. Should these resources remain more expensive, including such capacity beyond that necessary to comply with REPS, the result would be a resource mix that is not least-cost to Duke Energy Carolinas' customers. Mr. Mc Murry concluded that Dr. Blackburn has developed a plan that is not realistic and would result in a higher cost and decreased reliability for Duke Energy Carolinas' customers, which is counter to the cornerstone of resource planning.

Dr. Stevie testified on rebuttal in response to Mr. Wilson's criticisms of Duke Energy Carolinas evaluation of demand-side resources for the IRP. Dr. Stevie testified that Duke Energy Carolinas selected the base case over the high case from its demand-side resource options due to key uncertainties and questions as to whether DSM and EE can deliver anticipated capacity and energy savings reliably and whether customers are ready to embrace EE. He also restated that Duke Energy Carolinas reduced the impact levels of the high case to avoid any "double-counting" of impacts resulting from price-induced conservation arising from increasing electric bills. Dr. Stevie further testified that the impacts from the save-a-watt portfolio represent what Duke Energy Carolinas believes it can reasonably achieve until it has more experience with customer response and acceptance of the programs.

Dr. Stevie also testified that Duke Energy Carolinas' market potential study found roughly seventeen cost-effective residential measures; not the two cited by Mr. Wilson. He also stated that the other market potential studies cited by Mr. Wilson are out of date and not applicable because they were prepared prior to the passage of the Energy Independence and Security Act of 2007 (EISA), which mandates greater efficiency standards for lighting beginning in 2013. Dr. Stevie further testified that the McKinsey & Company study, cited by Mr. Wilson, overestimated its projected impacts because it double counted impacts and used questionable analysis relating to cost-effectiveness of programs, evidenced by its assertion that certain EE programs have a negative cost. Dr. Stevie reiterated that the only study that estimated the energy efficiency potential incorporating the EISA impacts is a study conducted by the Electric Power Research Institute for the period 2010 to 2030, which found a maximum achievable potential of 11.1% by the year 2030 and a 13.4% economic potential by the year 2030 for the South Census region.

Dr. Stevie explained that energy efficiency has not been relegated to a second-class resource by Duke Energy Carolinas, and that the Company places demand-side resource options in direct competition with its supply-side options in its optimization model. Duke Energy Carolinas has, consistent with the recommendations of Mr. Wilson, utilized a "bottom-up" approach to study the economic potential of EE, and adopted plans to gradually ramp up its programs over time to allow the programs to build success in overcoming customer and market barriers. Dr. Stevie agreed with Mr. Wilson's testimony wherein he stated:

Neither a potential study nor industry experience can provide a precise measure of 'cost-effective energy efficiency' in the same way that a supply-side generation plan can anticipate generation capacity with reasonable accuracy. These methods

may either under- or over-state the potential for energy efficiency to meet system resource needs in much the same way that a system load forecast is unable to provide an accurate prediction of future energy demand and use.

Dr. Stevie emphasized that the implementation of energy efficiency has greater uncertainty as a resource and as such, Duke Energy Carolinas needs to gain practical experience with energy efficiency programs to be sure that it can be counted on over the long-term to meet customer needs.

The Commission concludes that Duke Energy Carolinas has conducted reasonable and appropriate forecasts and assessments of supply-side and demand-side resources to meet its projected load and capacity needs over the planning horizons of the 2008 and 2009 IRPs. Duke Energy Carolinas has comprehensively evaluated supply-side and demand-side resource options, with due consideration to pending federal environmental legislation and regulation regarding greenhouse gas emissions, to meet long-term system requirements in a carbon-constrained energy future at the least cost to its customers.

#### EVIDENCE AND CONCLUSIONS FOR FINDING OF FACT 4

The evidence supporting this finding of fact appears in Duke Energy Carolinas' 2008 and 2009 IRPs, the comments of Public Staff in Docket No. E-100, Sub 118, the testimony of Duke Energy Carolinas witness Stevie and Public Staff witnesses Hinton and Floyd.

In the 2009 IRP, Duke Energy Carolinas identified eight demand response programs and seven energy efficiency initiatives or programs in its current demand-side portfolio. The current DSM measures are: (1) residential air conditioning load control (to be replaced by Power Manager), (2) interruptible service (Rider IS), (3) standby generator service (Rider SG), (4) time-of-use rates for residential service, (5) optional time-of-use rates for general and industrial service, (6) hourly pricing rates for incremental load, (7) Power Manager (residential air conditioning load control), and (8) PowerShare (non-residential curtailable program). The EE programs are: (1) Residential Energy Star rates, (2) Residential Energy Assessments, (3) SmartSaver for Residential Customers, (4) Low Income Services, (5) Energy Efficiency Program for Schools, (6) Non-Residential Energy Efficiency Assessments, and (7) SmartSaver for Non-Residential Customers. The list of current programs was updated from the 2008 IRP to reflect portfolio changes due to the Commission's initial approval of the save-a-watt portfolio in mid-2009. Many of these updated programs were listed as proposed programs in the 2008 IRP and Duke Energy Carolinas intends to continue the new demand response and energy efficiency programs through the term of its save-a-watt portfolio pilot and beyond.

Duke Energy Carolinas does not have any proposed DSM or EE programs in the 2009 IRP, however, Dr. Stevie noted in his testimony that the Company is in the process of developing several new programs, namely a home energy comparison report, a residential retrofit program, and an additional option to its PowerShare DSM program. Duke Energy Carolinas did not list any programs that were rejected from consideration or general consumer education programs in the 2008 or the 2009 IRP.

Dr. Stevie testified that the projected impacts from the current programs represent Duke Energy Carolinas base case load impacts that were used in the Company's resource analyses. The projected energy efficiency and DSM impacts assume that the current set of DSM programs remain in place over the forecast horizon. Dr. Stevie explained that the save-a-watt portfolio of EE programs have been approved by the Commission for a four-year period in Docket No. E-7, Sub 831, and under the base case, Duke Energy Carolinas has assumed that the EE programs continue for two additional four-year periods or "bundles", for a total of twelve years. It is this twelve-year projection of energy efficiency impacts that comprise the base case used in the 2008 and 2009 IRPs.

Dr. Stevie further testified that the twelve-year projection of load impacts assumes that the impacts from the first four-year bundle of programs are replicated in additional bundles, each of which starts after the prior one ends. In other words, the load reduction impacts from the second bundle begin in the fifth year of the analysis and the impacts from the third bundle begin in the ninth year of the analysis, *i.e.*, the start of each has a four year lag. The inclusion of additional bundles applies to the energy efficiency programs only because the DSM or demand response programs reach a maximum level in the first bundle.

Dr. Stevie explained that projected impacts in the 2009 IRP were reduced from those included in the 2008 IRP for several reasons. First, the start of the programs was delayed to the middle of 2009, consistent with the Commission order approving the implementation of the programs. Second, the impacts were scaled up in the third and fourth years to be consistent with the requirements of the settlement agreement in Docket No. E-7, Sub 831. However, consistent with that agreement, it was also assumed that Duke Energy Carolinas would include 85% of the revenue requirements in the computation of the recovery rider. As a result, for the base case, Duke Energy Carolinas included 85% of the projected load impacts. Third, new information on the load shape associated with hourly load savings from the installation of compact fluorescent light bulbs has been incorporated into the projection of the coincident peak load impacts. This new information resulted in a reduction in the level of energy efficiency peak savings projected for the 2009 IRP as compared to the 2008 IRP.

Under Duke Energy Carolinas' base case, the projected load impacts are set forth in the table below:

EE and DSM Base Case		
Load Impacts in IRP (1)		
	EE MWH	EE & DSM MW
2010	309,917	416
2011	584,555	643
2012	1,014,730	814
2013	1,317,350	852
2014	1,572,072	882
2015	1,919,128	925
2016	2,385,480	982
2017	2,613,110	1,025
2018	2,859,958	1,055
2019	3,210,799	1,083
2020	3,684,262	1,140
(1) Excludes impacts from IS and SG.		

Duke Energy Carolinas has made a strong commitment to pursue the implementation of its EE and DSM plan through its save-a-watt portfolio and continues its on-going collaborative work with interested stakeholders to develop and implement additional EE and DSM products and services for the benefit of its customers.

Public Staff Witness Floyd noted, as Dr. Stevie did, that Duke Energy Carolinas' load impacts were slightly lower in its 2009 IRP as compared to its 2008 IRP, likely as a result of the delays related to the implementation and approval of the programs. Mr. Floyd, and Mr. Hinton, recommended that Duke Energy Carolinas utilize its DSM resources to obtain the maximum system value possible, particularly with respect to the use of its new Power Manager air conditioning cycling program.

The Commission concludes that Duke Energy Carolinas has conducted reasonable assessments of cost effective demand-side management and energy efficiency resources and has undertaken appropriate plans to implement its approved demand-side resources and to identify new cost effective demand-side resources as future portfolio options.

#### EVIDENCE AND CONCLUSIONS FOR FINDING OF FACT 5

The evidence supporting this finding of fact appears in Duke Energy Carolinas' 2008 and 2009 IRPs, the comments of Public Staff in Docket No. E-100, Sub 118, the testimony of Duke Energy Carolinas witness Mc Murry and Public Staff witness Ellis.

Reserve margins in Duke Energy Carolinas' 2008 and 2009 IRP filings are comparable to those in previous filings. Duke Energy Carolinas noted that the removal of the Orangeburg load pursuant to the mandates of the Orangeburg Order increased the projected reserve margins by approximately 1% per year, but did not ultimately change the amount or timing of future generation resources. In its 2008 and 2009 IRPs, Duke Energy Carolinas illustrated the resource requirements necessary to meet its load obligations over the planning period,

plus a 17% target planning reserve margin, which Duke Energy Carolinas' historical experience has shown to be reasonable and prudent for planning purposes.

Duke Energy Carolinas continually reviews its generating system capability, level of potential DSM activations, schedule maintenance, environmental retrofit equipment and environmental compliance requirements, purchased power availability, and transmission capability to assess its capability to reliably meet customer demand. Duke Energy Carolinas also identified certain risks that must be to be considered with respect to meeting its reserve margin target. These risks include: (1) increasing age of existing units on the system; (2) the inclusion of a significant amount of Renewables (which are generally less reliable than traditional supply-side resources) in the plans due to the enactment of a REPS in North Carolina; (3) uncertainty regarding the impacts associated with significant increases in the energy efficiency and DSM programs and the actual results that will be achieved; (4) longer lead times for building baseload capacity such as coal and nuclear; (5) increasing environmental pressures that may cause additional unit de-rates and/or unit retirements; and (6) increases in de-rates of units due to extreme hot weather and drought conditions.

The Public Staff reviewed Duke Energy Carolinas reserve margins in the 2008 and 2009 IRPs, believed that Duke Energy Carolinas' reserves should be adequate at this time, and recommended that Duke Energy Carolinas maintain its target reserve margins as filed. Public Staff Witness Ellis initially stated in his pre-filed affidavit that Duke Energy Carolinas Witness Mc Murry testified that the inclusion of undesignated wholesale load *along created the need for additional peaking generation resources over the planning period.* Mr. Mc Murry responded to Mr. Ellis that the addition of the Central load as a firm system requirement, as well as the addition of certain undesignated load, gave rise to the need for additional peaking resources during the planning period. Mr. Mc Murry also emphasized that the 2009 IRP clearly established the need for Lee Nuclear in the 2018 to 2021 timeframe with or without the inclusion of the Central load or additional undesignated wholesale load.

The Commission thus concludes that the target reserve margins set by Duke Energy Carolinas in its 2008 and 2009 IRPs are reasonable and prudent for planning purposes.

#### EVIDENCE AND CONCLUSIONS FOR FINDING OF FACT 6

The evidence supporting this finding of fact appears in Duke Energy Carolinas' 2008 and 2009 IRPs, the comments of Public Staff in Docket No. E-100, Sub 118, and the affidavits of Public Staff witnesses Ellis and Lucas.

Public Staff's comments filed in Docket No. E-100, Sub 118 stated that Duke Energy Carolinas' 2008 IRP included the information required under R8-60 relating to generation facilities, wholesale contracts, busbar information, transmission adequacy, and planning and assessment of alternative supply side resources. With respect to the 2009 IRP, Public Staff witnesses Ellis and Lucas, in their respective affidavits, testified that Duke Energy Carolinas also provided the required information in its 2009 filing. A brief summary of Duke Energy Carolinas relevant information follows:

## GENERATION FACILITIES

### Existing Generation

In both its 2008 and 2009 IRPs, Duke Energy Carolinas provided a list of its existing generation facilities by resource type, corresponding amounts of relevant capacity by resource and total generating capacity. In its 2008 IRP, Duke Energy Carolinas' listed existing generation facilities consisting of 30 coal-fired units with a combined capacity of 7,793 MW (winter) and 7,672 MW (summer); 51 combustion turbines, with a combined capacity of 3,626 MW (winter) and 3,265 MW (summer); 84 hydroelectric units, with a combined capacity of 1,128 MW (winter) and 1,128 MW (summer); eight pumped storage units, with a combined capacity of 2090 MW (winter) and 2090 (summer); and seven nuclear units, with a combined capacity of 7,233 MW (winter) and 6,996 MW (summer). In total, in the 2008 IRP, Duke Energy Carolinas listed a generating capacity of 21,874 MW (winter) and 21,152 MW (summer). In its 2009 IRP, Duke Energy Carolinas' listed existing generation facilities were almost identical to those listed in 2008, with a reduced total combustion turbine capacity of 67 MW (summer) and 124 MW (winter) resulting from capacity de-rates at Buck, Dan River and Riverbend Stations. In total, in its 2009 IRP, Duke Energy Carolinas listed a generating capacity of 21,874 MW (winter) and 21,152 MW (summer).

### Planned Generation Additions

In both its 2008 and 2009 IRPs, Duke Energy Carolinas included a list of planned generation projects. As of the 2009 IRP, Duke Energy Carolinas' planned generation additions consist of the following projects: (1) New Cliffside Pulverized Coal Unit - 825 MW Cliffside Unit 6, which is scheduled to be on line in 2012; (2) Bridgewater Hydro Powerhouse Upgrade - The two existing 11.5 megawatt units at Bridgewater Hydro Station are being replaced by two 15 megawatt units and a small 1.5 megawatt unit to be used to meet continuous release requirements, which is scheduled to be available for the summer peak of 2012; (3) Jocassee Unit 1 and 2 Runner Upgrades - Capacity additions reflect an estimated 50 MW capacity up-rate at the Jocassee pumped storage facility from increased efficiency from the new runners to be installed in 2011; (4) Belews Creek Lower Pressure Rotor Upgrade - Capacity additions reflect an estimated 26 MW capacity up-rate at Belews Creek Steam Station due to increased efficiency from new low pressure turbine rotors on Units 1 and 2 to be installed in 2009 and 2010; (5) Buck Combined Cycle Natural Gas Unit – originally to be phased in, but now will proceed straight to a combined cycle unit to be operational by the end of 2011 and available by the summer of 2012; and (6) Dan River Combined Cycle Natural Gas Unit – originally scheduled to be available by the summer of 2012, the operation date has been moved back to the summer of 2013. The evaluation and planning process also continues for the Lee Nuclear Station in Cherokee County, South Carolina, with a revised commercial operation date target in the 2018 to 2021 timeframe

### Non-Utility Generation

Duke Energy Carolinas reported a list of non-utility generators in its 2008 IRP and did not update its list in the 2009 IRP. The list within the 2008 IRP included 1,333 MW of merchant generation, of which 458 MW has been categorized as supply-side resources; 156 MW of



PURPA qualifying facility generation, all of which has been categorized as supply-side resources; 208 MW of customer-owned generation, all of which has been categorized as supply-side resources; and 290 MW of customer-owned self-generation that is not categorized as supply-side resources. Duke Energy Carolinas also listed 19.4 MW of utility-owned standby generation that is not included in the Company supply-side resources.

## WHOLESALE CONTRACTS FOR THE PURCHASE AND SALE OF POWER

In both its 2008 and 2009 IRPs, Duke Energy Carolinas provided a list of (1) its full requirements wholesale power sales to municipalities in North and South Carolina; (2) its full requirements and supplemental wholesale power sales to North Carolina and South Carolina cooperatives; (3) its backstand agreements with North Carolina Municipal Power Authority 1 and North Carolina EMC; and (4) its firm shaped capacity sale to North Carolina EMC. The 2009 IRP also included the new firm purchased power agreement with Central under which Duke Energy Carolinas will supply Central's supplemental resource needs starting in 2013 of approximately 130 MW growing to 1100 MW by 2028. Pursuant to the Commission's *Order on Advance Notice* in Docket No. E-7, Sub 923, Duke Energy Carolinas also provided certain updated information relating to the undesignated wholesale load set forth within the 2009 IRP.

Duke Energy Carolinas has secured various purchased power agreements (PPAs) with power marketers and non-utility generators that are currently in effect or will begin over the next couple of years. In 2009, the overall summer capability of the purchased power contracts was approximately 742 MW. The capability in megawatts varies depending on the start times, duration, and capability of each contract. The majority of these contracts (459 MW) will expire at the end of 2010.

Duke Energy Carolinas has been active in the wholesale purchased power market since 1996 and during that time, has entered into contracts totaling 2500 MWs to meet customer needs. The use of supply side requests for proposal (RFPs) for peaking and intermediate capacity is a component of Duke Energy Carolinas' resource procurement strategy, for traditional and renewable generation resource options.

## BUSBAR INFORMATION

Duke Energy Carolinas included information on levelized busbar costs for various generation technologies in its 2008 and 2009 IRPs, as required by Commission Rule R8-60(i)(9).

## TRANSMISSION FACILITIES

Duke Energy Carolinas included a copy of its most recent FERC Form 715 in both the 2008 and 2009 IRPs, and discussed with the Public Staff and submitted with its IRPs, detailed information concerning its transmission line inter-tie capabilities, transmission line loading constraints, planned new construction and upgrades, and NERC compliance within their respective control areas, for the planning period under consideration for both IRPs. Duke Energy Carolinas is in compliance with the Commission's filing requirements and NERC transmission reliability standards.

## ALTERNATIVE SUPPLY SIDE RESOURCES

Duke Energy Carolinas has included evaluations and screenings in its 2008 and 2009 IRPs for a variety of alternative supply side options, as identified in Rule R8-60(c). Those options considered for the quantitative analysis included bids for on-shore and off-shore wind, biomass firing, including existing unit co-firing; poultry waste firing, digester biogas firing, landfill methane firing, hog digester firing technologies, and solar photovoltaic resources. Duke Energy Carolinas also considered, but excluded coal-fired fluidized bed technology, compressed air energy storage, advanced battery storage and fuel cell from the quantitative analysis for cost, applicability, and scalability limitations.

The Commission thus concludes that Duke Energy Carolinas has provided the required information relating to its generation facilities, wholesale power contracts, leveled busbar analysis, transmission facilities and assessment of alternative supply side resources in its 2008 and 2009 IRPS, thereby reasonably satisfying the requirements of Rule R8-60.

## EVIDENCE AND CONCLUSIONS FOR FINDING OF FACT 7

The evidence supporting this finding of fact appears in Duke Energy Carolinas' 2008 and 2009 REPS Compliance Plans, the comments of Public Staff in Docket No. E-100, Sub 118, the testimony of Duke Energy Carolinas witness Smith and the testimony and affidavit of Public Staff witness Lucas.

Duke Energy Carolinas' 2008 and 2009 REPS Compliance plans set forth the Company's strategy to build its portfolio of renewable resources to meet the requirements of G.S. 62-133.8 over the respective planning periods. Duke Energy Carolinas' compliance strategy is based on a combination of resource options: (1) renewable energy resources owned and/or operated by Duke Energy Carolinas; (2) PPAs from renewable power generation facilities; (3) purchases of unbundled renewable energy certificates ("REC" or "RECs"); and (4) the utilization of cost-effective EE, subject to the statutory limitations of G.S. 62-133.8( ). Duke Energy Carolinas has focused on maintaining a disciplined diversity of Company-owned and third-party supplier resources to minimize costs to customers while also building specific competencies relating to development and operation of renewable resources like solar, wind and "brownfield" biomass. Duke Energy Carolinas is evaluating the co-firing of wood fuel with coal at its Buck and Lee Steam Stations and planning a demonstration project in the Pamlico Sound that would result in the construction and operation of up to three water-based wind turbines at full implementation.

As part of its portfolio of resources, Duke Energy Carolinas will provide services, including delivery of renewable energy resources, to wholesale customers who request its assistance in meeting the REPS requirements. These wholesale customers—including EMCs, municipalities, and other wholesale customers—may rely on Duke Energy Carolinas to provide this renewable energy delivery service in accordance with G.S. 62-133.8(c)(2)e. Currently, Duke Energy Carolinas plans to supply all of the renewable energy resources for Rutherford

Electric Membership Corporation, City of Dallas, Forest City, City of Concord, Town of Highlands, and City of Kings Mountain.

Duke Energy Carolinas' only REPS compliance requirements over the subject planning periods of the 2008 and 2009 REPS Compliance Plans are the 2010 and 2011 solar resource requirements. Pursuant to G.S. 62-133.8(d), Duke Energy Carolinas must use solar energy resources equal to a minimum of two hundredths of one percent (0.02%) of the total electric power in kilowatt hours sold to retail customers in North Carolina, or an equivalent amount of energy by 2010. Based on the current retail sales projection, Duke Energy Carolinas' total retail and wholesale REPS solar energy requirement is estimated to be 11,142 MWh in 2010 and 11,246 MWh in 2011. Duke Energy Carolinas has adhered to the previously described renewable energy strategy in planning to meet the solar set-aside requirements for 2010 and 2011. Specifically, Duke Energy Carolinas has (1) executed a twenty year PPA with SunEdison for the purchase of all electricity generated from a proposed 15.5 MW (AC) solar farm in Davidson County, NC; (2) begun implementation of its Distributed Generation Solar PV Program that will ultimately result in the construction of 10MW (DC) of solar PV projects on customer sites and/or Duke Energy owned property by the end of 2010; and (3) entered into purchase agreements for solar RECs with multiple solar development firms. Duke Energy Carolinas stated in its 2009 REPS Compliance Plan that it is confident that it will meet the solar resource requirements for 2010 and 2011.

Duke Energy Carolinas submitted in its 2008 and 2009 REPS Compliance Plans its projections of customer accounts by class and its current avoided cost rates. Duke Energy Carolinas projects that its REPS compliance costs over the 2009 REPS compliance planning period will be as follows:

**Projected Annual Cost Caps and Compliance Costs**

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

Duke Energy Carolinas Witness Smith reiterated that the Company was confident that it would achieve compliance with the solar REPS requirements over the subject REPS compliance planning period. He testified that the swine and poultry waste set asides presented certain challenges in terms of compliance beyond the planning period, but that Duke Energy Carolinas continued to pursue efforts to secure resources to meet those requirements. Mr. Smith further testified that Duke Energy Carolinas is forecasting that it should be able to meet its statutory REPS requirements through 2019 within the cost cap limitations, although the Company's ability to accomplish this remains somewhat uncertain at this time.

Public Staff Witness Lucas testified that the Public Staff believes that Duke Energy Carolinas can meet its REPS requirements for the time period covered by its REPS Compliance Plans. He stated that Duke Energy Carolinas had anticipated difficulties in meeting the swine and poultry waste set-asides in 2012, but that Duke Energy Carolinas and the other utilities had taken significant steps towards resolving some challenges with those resources. Mr. Lucas

further testified that he agreed that Duke Energy Carolinas could meet the statutory requirements over the long term, but that there was potential that it could hit the cost caps. Public Staff Witness Ellis testified that over the short and mid-term, he believed that Duke Energy Carolinas could meet its REPS requirements, but that after 2015, compliance under the cost caps could be challenging. Mr. Ellis specifically referenced that the megawatt-hour requirements increased disproportionately to the cost caps during that period.

The Commission concludes that Duke Energy Carolinas' 2008 and 2009 REPS Compliance Plans comply with the requirements of Rule R8-67(b), are reasonable for the purposes of this proceeding and are approved as filed.

#### EVIDENCE AND CONCLUSIONS FOR FINDING OF FACT 8

The evidence supporting this finding of fact appears in Duke Energy Carolinas' 2008 and 2009 IRPs and REPS Compliance Plans, the comments of Public Staff in Docket No. E-100, Sub 118, the testimony of Duke Energy Carolinas, Public Staff, NC WARN, and Environmental Intervenor witnesses in this consolidated proceeding.

Based on the foregoing, the Commission's review of Duke Energy Carolinas' 2008 and 2009 IRPs and REPS Compliance Plans, all comments and testimony filed in this consolidated docket, and the entire record of this proceeding, the Commission concludes that Duke Energy Carolinas' 2008 and 2009 IRPs comply with the requirements of G.S. 62-110.1, G.S. 62-2(a)(3a) and Rules R8-60 and R8-67, are reasonable for the purposes of this proceeding, and are approved as filed. The Commission further concludes that Duke Energy Carolinas has responded to all subsections of Rule R8-60(c) and Rule R8-67(b) as required, and that Duke Energy Carolinas' peak and energy forecasts are reasonable for planning purposes and it has comprehensively assessed supply-side and demand-side resource options to develop a reasonable resource plan to reliably meet future needs at least cost to its customers.

IT IS, THEREFORE, ORDERED as follows:

1. That this Order shall be adopted as a part of the Commission's current analysis and plan for the expansion of facilities to meet future requirements for electricity for North Carolina pursuant to G.S. 110.1(c);
2. That the 2008 and 2009 Integrated Resource Plans filed in this consolidated proceeding by Duke Energy Carolinas hereby are approved; and
3. That the 2008 and 2009 REPS Compliance Plans filed in this consolidated proceeding by Duke Energy Carolinas hereby are approved.

ISSUED BY ORDER OF THE COMMISSION.

This the \_\_\_\_ day of \_\_\_\_, 2010.

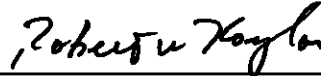
NORTH CAROLINA UTILITIES COMMISSION

---

CERTIFICATE OF SERVICE

I certify that a copy of Duke Energy Carolinas, LLC's Proposed Order in Docket Nos. E-100, Sub 118 and E-100, Sub 124 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 11<sup>th</sup> day of June, 2010.



---

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