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

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

January 11, 2010

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

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

Dear Ms. Vance:

Enclosed for filing are the original and thirty (30) copies of Duke Energy Carolinas, LLC's Direct Testimony of Witnesses Richard G. Stevie, Ph.D.; Owen A. Smith; Robert A. McMurry and James A. Riddle in the above referenced dockets.

Also enclosed is the Revised 2009 IRP of which 17 CONFIDENTIAL and 14 PUBLIC versions are being filed.

Sincerely,

Robert W. Kaylor

Robert W. Kaylor

Enclosures

cc: Parties of Record

Clerk-15 w/ confidential IRP
7 Comm
Bonnet
Kirby
Watson
Hoover
Kite
Hilburn
Sessoms
Ellison
Jones
W/O Confidential IRP
AG
Ex Dir
3 PS Legal
3 PS Acctg
2 PS Ec Res
3 PS Elec

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-100, SUB 118
DOCKET NO. E-100, SUB 124

DOCKET NO. E-100, SUB 118 In the Matter of Investigation of Integrated Resource Planning in North Carolina – 2008 DOCKET NO. E-100, SUB 124 In the Matter of Investigation of Integrated Resource Planning in North Carolina – 2009	**DIRECT TESTIMONY OF JAMES A. RIDDLE FOR DUKE ENERGY CAROLINAS, LLC**

I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, BY WHOM YOU ARE EMPLOYED, AND IN WHAT CAPACITY.

A. My name is James A. Riddle. My business address is 139 E. Fourth St., Cincinnati, Ohio. I am Manager, Load Forecasting in the Customer Market Analytics Department for Duke Energy Business Services LLC ("Duke Energy Business Services"), a wholly-owned service company subsidiary of Duke Energy Corporation ("Duke Energy"). Duke Energy Business Services provides various administrative services to Duke Energy Carolinas, LLC ("Duke Energy Carolinas" or the "Company") and other Duke Energy affiliates including Duke Energy Ohio, Inc., Duke Energy Indiana, Inc., and Duke Energy Kentucky, Inc.

Q. PLEASE BRIEFLY DESCRIBE YOUR DUTIES AND RESPONSIBILITIES AS MANAGER OF LOAD FORECASTING.

A. I have responsibility for load forecasting across all regulated jurisdictions served by Duke Energy. I direct the preparation of each operating company's demand, energy, and customer forecasts, including the collection, analysis, and presentation of the data used for the forecasts. I also am responsible for reviewing new techniques of analysis and forecast preparation to ensure that reasonable forecasting procedures are used.

Load Forecasting is a function of the Customer Market Analytics Department, which is responsible for providing functional analytical support to Duke Energy Carolinas as well as the other Duke Energy affiliates previously mentioned.

Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL BACKGROUND AND BUSINESS EXPERIENCE.

A. I received a B.S. degree in Agriculture from Wilmington College, Ohio in June 1979. In June 1981, I received a Master of Science degree in Agricultural Economics from the Ohio State University. I worked as a Field Office Manager/Loan Officer for the Farm Credit System in Ohio from July 1981 to September 1985.

In April 1986, I was hired by the Cincinnati Gas & Electric Company ("CG&E"), now known as Duke Energy Ohio, Inc., as an Associate Economic Analyst. Since that time I have been involved in the preparation of the gas and electric forecasts, which includes data collection and organization, regression analysis, model building and solving, report writing, and dissemination of the forecast.

In 1995, subsequent to the merger of CG&E with PSI Energy, Inc., I was promoted to Supervisor, Load Forecasting in the Retail Market Analysis Department with responsibility for the preparation of Cinergy's Gas and Electric Load Forecasts.

In my current role as Manager, Load Forecasting I responsible for the preparation of the Gas and Electric Load Forecasts of the Midwest and Carolinas operating company subsidiaries of Duke Energy, including Duke Energy Carolinas, Duke Energy Ohio, Inc., Duke Energy Indiana, Inc., and Duke Energy Kentucky, Inc.

Q. HAVE YOU PREVIOUSLY PROVIDED TESTIMONY BEFORE ANY REGULATORY AGENCIES?

A. Yes. I have presented testimony on several occasions before the Kentucky Public Service Commission, the Indiana Utility Regulatory Commission, and the Public Utilities Commission of Ohio.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. My testimony presents and explains Duke Energy Carolinas' long-term energy and demand forecasts prepared in 2008 and 2009, which were utilized in the Company's Integrated Resource Plans ("IRPs") filed with the Commission on November 3, 2008 and September 1, 2009, as updated on January 11, 2010 ("Revised 2009 IRP").

Q. PLEASE DESCRIBE THE EXHIBITS TO YOUR TESTIMONY.

A. Riddle Exhibit No. 1 provides a summary of the 2008 and 2009 load forecasts for energy and peak demand. Riddle Exhibit No. 2 provides information on the peak loads, contract terms, and the growth rate projections for each wholesale customer. Riddle Exhibit No. 3 provides a summary of the Base Case projected energy efficiency impacts as well as the energy and peak forecast after it has been adjusted for the projected impacts from the new energy efficiency programs.

Q. WERE RIDDLE EXHIBITS 1 THROUGH 3 PREPARED BY YOU OR AT YOUR DIRECTION AND UNDER YOUR SUPERVISION?

A. Yes.

II. LOAD FORECASTS

Q. DID YOU PARTICIPATE IN THE PREPARATION OF THE COMPANY'S 2008 AND 2009 LOAD FORECASTS?

A. Yes, I participated directly in the development of the forecasts, along with the people who directly report to me. I have reviewed the projections and found them to be reasonable and appropriate for preparing the resource plans of the Company.

Q. HOW IS DUKE ENERGY CAROLINAS' LOAD FORECAST DEVELOPED?

A. The 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. The methodology used in the 2008 and 2009 forecasts is the same as that utilized by the Company for past plans filed with this Commission. The models are updated on a regular basis to include the most recent data available, and forecasts are completed as needed to allow adequate time to complete the resource planning work in advance of the IRP deadline.

Q. PLEASE DESCRIBE HOW THE SERVICE AREA ECONOMIC FORECAST IS OBTAINED.

A. The economic forecast for the Duke Energy Carolinas region is obtained from Moody's Economy.com, a nationally recognized economic forecasting firm. Based upon its forecast of the national economy, Moody's Economy.com prepares a forecast of key economic concepts for the Carolinas. The local economic forecast provides detailed projections of employment, income, wages,

industrial production, inflation, prices, and population. This information serves as input into the energy forecast models.

Q. HOW IS THE ENERGY FORECAST DEVELOPED?

A. The energy forecast projects the load of Duke Energy Carolinas' major retail customer classes – residential, commercial, industrial, and street lighting – as well as wholesale customers. The projected energy requirements for Duke Energy Carolinas' retail and wholesale electric customers are determined through econometric analysis. Econometric models are a means of representing economic behavior through the use of statistical methods, such as regression analysis.

Q. WHAT ARE THE PRIMARY FACTORS AFFECTING ENERGY USAGE?

A. Some of the primary factors are the number of customers, weather, energy price, and economic activity measures including employment, industrial production, and income. Energy use typically increases with greater economic activity and declines with lower economic activity.

Q. ARE THESE FACTORS RECOGNIZED IN THE ECONOMETRIC MODELS USED TO PROJECT THE ENERGY REQUIREMENTS OF DUKE ENERGY CAROLINAS' RETAIL CUSTOMERS?

A. Yes. By including these variables in the forecasting process, future energy consumption can be projected based on forecasts of these customer, economic, and weather factors.

Q. HOW IS THE FORECAST OF ENERGY REQUIREMENTS FOR DUKE ENERGY CAROLINAS PREPARED?

A. The 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 class and major industrial sector. The forecast of the economic concepts is employed with each econometric equation to produce a forecast of sales. The forecasts of sales are summed to generate the projection of total delivered load. The forecast of total energy is arrived at after including line losses, which occur as power travels over the transmission and distribution network.

Q. ARE THERE ANY ADJUSTMENTS MADE TO THE FORECASTS DERIVED FROM THE ECONOMETRIC MODELS?

A. The Company may adjust the forecast for anticipated increases in load due to a major new customer or a significant expansion at a current customer's site. For the 2008 and 2009 Load Forecasts, there were no adjustments to the retail sales projection for new individual customer loads or expansion at any current customer's site. However, adjustments were made to the forecast in two areas. First, the forecast was adjusted to incorporate the impacts from the projected adoption of electric vehicles. Second, the forecast of wholesale sales was adjusted for known or anticipated changes in wholesale contracts.

Q. HOW WERE THESE ADJUSTMENTS DEVELOPED?

A. With respect to electric vehicles, information on the historical market penetration of hybrid vehicles was used to develop a projection of the market penetration of Plug-In Hybrid Electric Vehicles ("PHEV"). An end-point or final PHEV penetration level was established based on Company communications with major

original equipment manufacturers, expected government subsidies, and gasoline price elasticity. Then, the population forecast for each service territory (NC, SC, IN, OH, and KY) is used to project the anticipated total number of PHEVs within each service territory.

With respect to wholesale sales contracts, econometric forecasting models are developed for each wholesale customer in a process similar to that used for retail to produce MWh sales forecasts. Where contracts are in place, the wholesale forecasts are incorporated into the final forecasts based on dates of service specified in the contracts. As discussed by Company Witness Mc Murry and reflected in the Revised 2009 IRP, the Company revised the 2009 Load Forecast to further adjust projected wholesale load consistent with the requirements of the Commission's *Order on Advance Notice* in Docket No. E-7, Sub 923.

Q. HOW DOES JUDGMENT FIT INTO THE LOAD FORECASTS?

A. Under any approach to load forecasting, judgment is required in many ways, from the selection of a methodology to the choice of forecast variables and data. In addition, judgment is utilized in evaluating the reasonableness of the models and the resulting forecasts. Every utility must use the approach that, in its judgment, best applies to forecasting its customer loads.

Q. PLEASE EXPLAIN HOW THE PEAK FORECASTS ARE DEVELOPED.

A. The Company projects both a summer and a winter peak for the total Duke Energy Carolinas service area. Using factors for the weather around the time of

the peak as well as measures of economic activity (total energy), econometric models are developed to forecast peak loads.

Q. WHAT IS THE FORECAST FOR ENERGY AND PEAK DEMAND FOR DUKE ENERGY CAROLINAS?

A. Riddle Exhibit No. 1 provides a summary of the 2008 and 2009 load forecasts for energy and peak demand. The 2008 15-year projected growth rates in energy and summer peak demand are 1.4% and 1.6%, respectively. The 2009 15-year projected growth rates in energy and peak demand are 1.4% and 1.5%, respectively. The growth rates are computed before incorporating projected reductions from the impacts of the Company's energy efficiency programs.

Q. WHAT ARE THE PRIMARY REASONS FOR THE DIFFERENCES IN THE 2008 AND 2009 LOAD FORECASTS?

A. There are several areas in which the 2009 forecast changed. First and foremost, there was a change in the economic outlook and declining commercial and industrial sales due to the slowing economy. The long-term annual growth rate (2008 to 2018) projections between the two forecasts for non-manufacturing employment declined from 1.8% to 1.4%; and the projections for manufacturing output declined from 1.7% to 1.2%, respectively. Even more telling are the changes in short term growth rates. For the year 2009, the growth in non-manufacturing employment declined from 1.7% to -1.3% between the two forecasts and the growth in manufacturing output declined from 1.9% to -3.5%. For the year 2010, the growth in non-manufacturing employment declined from

1.9% to 0.4% between the two forecasts and the growth in manufacturing output declined from 2.1% to -0.5%.

Second, there were changes in the projections of wholesale electric sales and increased estimates of the impacts from the Company's save-a-watt programs and for energy efficiency.

Third, the potential impact of carbon legislation on load was estimated directly through a projected increase in electric prices to Duke Energy Carolinas' customers.

Finally, the 2009 forecast includes positive impacts from the adoption of electric vehicles.

Q. WHAT IS THE FORECAST OF PEAK LOAD FOR THE WHOLESALE CUSTOMERS AND WHAT ARE THE TERMS OF THE VARIOUS CONTRACTS?

A. Riddle Exhibit No. 2 provides information on the peak loads, contract terms, and the growth rate projections for each wholesale customer. Page 102 of the Revised 2009 IRP shows the forecasted growth rate in Company load is 1.2% per year from 2008 to 2024.

Q. WHY DO THE WHOLESALE GROWTH RATE PROJECTIONS DIFFER FROM DUKE ENERGY CAROLINAS' PROJECTION FOR RETAIL LOAD?

A. As noted above, with respect to wholesale sales contracts, econometric forecasting models are developed for each wholesale customer in a process similar to that used for retail to produce MWh sales forecasts. The wholesale

customer growth rates vary among customers, and also differ from the historical growth rate in the Company's retail load. Page 102 of the Revised 2009 IRP shows an average annual historical growth rate of 1.4% per year from 2003 to 2008 in total Duke Energy Carolinas' load. However, the average annual historical growth rate for wholesale customers in that time period was 3.0%. Just as historical wholesale load growth rates have been different than Duke Energy Carolinas' overall load growth, the projected growth rates are likely to be different. Riddle Exhibit No. 2 also provides the historical growth in peak loads for the wholesale customers.

Load growth rates can be influenced by changes and/or differences in population, employment, industrial output, customer growth, and customer mix. In general, the wholesale customers have a greater concentration of residential and commercial as compared to Duke Energy Carolinas, where the concentration is almost equally split among Residential, Commercial, and Industrial. Because of these types of characteristic differences between the Company's retail load and each of the wholesale customers, different growth rates are to be expected.

Additionally, the growth rates for Central Electric Cooperative ("Central") and North Carolina Electric Membership Corporation ("NCEMC"), are driven primarily by contract terms. The Central contract provides for a seven year "step-in" to the customer's full load requirement such that Duke Energy Carolinas will provide only 15% of Central's total member cooperative load in the Company's Balancing Authority Area requirement in 2013. This will be followed by 15% annual increases in load over the subsequent six years until 100% of the

contracted load is served. The NCEMC sale is essentially a fixed quantity of capacity and energy specified by the contract. The contract also gives NCEMC an option to increase the amount of capacity by 25 MWs for specific years of the contract. Therefore, the growth rates for those wholesale customers do not reflect underlying economic conditions, and as a result, are not really applicable.

Q. DOES DUKE ENERGY CAROLINAS' ENERGY AND PEAK LOAD FORECAST ALREADY INCLUDE THE IMPACT OF HISTORICAL CONSERVATION PROGRAMS?

A. Yes, the impacts from historical conservation/energy efficiency programs that have been implemented in the Duke Energy Carolinas service area are already reflected in these forecasts. The historical data used to develop the Load Forecasts incorporate the historical impact of those programs.

Q. HOW IS THE IMPACT FROM CUSTOMER-DRIVEN ENERGY EFFICIENCY REFLECTED IN THE DUKE ENERGY CAROLINAS' FORECAST?

A. Customer interest in energy efficiency is not new. For example, this interest has been reflected over the years through changes in building codes and efficiency improvements in heating and air conditioning equipment and appliances. As a result, past trends and impacts of energy efficiency are captured in the historical data and reflected in the coefficients developed for the forecasting models. The forecast reflects a continuation of the trend for increasing energy efficiency.

These trends are not expected to change suddenly. However, to the extent that new directions on energy efficiency develop, such as from legislative

initiatives like the Energy Independence and Security Act of 2007, additional adjustments are made to the sales forecast to incorporate the impacts.

Q. DOES DUKE ENERGY CAROLINAS PREPARE A LOAD FORECAST THAT INCLUDES THE PROJECTED IMPACT FROM THE INSTALLATION OF MEASURES FROM ITS NEW ENERGY EFFICIENCY PROGRAMS?

A. Yes. Riddle Exhibit No. 3 provides a summary of the Base Case projected energy efficiency impacts as well as the energy and peak forecast after it has been adjusted for the projected impacts from the new energy efficiency programs. The Base Case projected energy efficiency load impacts are incorporated in the development of the IRP for the purpose of identifying generation needs. That is the typical way to incorporate incremental energy efficiency effects in the creation of an integrated resource plan.

Q. ARE THERE LOAD IMPACTS FROM OTHER PROGRAMS IN THE IRP THAT ARE NOT REFLECTED IN DUKE ENERGY CAROLINAS' LOAD FORECAST?

A. Yes. The load forecast does not reflect the impact of load reductions due to the Company's demand response or Demand-Side Management ("DSM") programs such as Power Manager, Power Share, Standby Generators, and Interruptible Service. The load forecast portrays the level of expected peak demand prior to any reductions for DSM programs. The projected impacts of the DSM programs are captured and incorporated in the development of the annual resource plan as an offset to the load forecast. Information on the projections of the energy

efficiency and DSM programs is provided in the testimony of Company Witness Stevie.

Q. WHAT WAS THE IMPACT OF THESE PROGRAMS ON THE PEAK LOAD IN 2008 AND 2009?

A. The 2008 actual native summer peak load on June 9th was 17,711 MW, which excludes the non-Duke Energy Carolinas load associated with the four Catawba co-owners. This load would have been 83 MW higher if it had not been for the impacts of load reductions achieved by customers on rate schedule HP (hourly pricing). DSM programs encourage customers to reduce load during higher cost time periods. Including the load reductions implies the actual load would have been 17,794 MW. After accounting for the difference between actual and normal weather, the 2008 peak load was 17,704 MW, which is about 1.7% below the projected peak of 18,011 MW.

The 2009 actual native summer peak load on August 10th was 16,875 MW, which excludes the non-Duke Energy Carolinas load associated with the four Catawba co-owners. There we no load reductions due to rate schedule HP. After accounting for the difference between actual and normal weather, the 2009 peak load was 17,100 MW, which is about 2.2% below the projected peak of 17,479 MW.

Q. ARE YOU FAMILIAR WITH OTHER ELECTRIC UTILITIES' LONG-TERM LOAD FORECASTS?

A. Yes, I am. Over my career in forecasting, I have had the opportunity to review the forecasts and methodologies of numerous utilities as well as to study the literature on forecasting.

Q. ARE THE FACTORS THAT ARE USED BY DUKE ENERGY CAROLINAS IN FORMULATING ITS LOAD FORECASTS SIMILAR TO THE FACTORS USED BY OTHER UTILITIES IN THEIR LOAD FORECASTS?

A. Yes. While the forecasting approaches that other utilities use to prepare load forecasts may vary (including use of econometric, end-use, trend analysis, or time series analysis), nearly all of the utilities I am familiar with use the same factors considered by Duke Energy Carolinas. These commonly used factors include: population, weather data, income, industrial production measures, price, and other economic concepts.

Q. WHAT HAS BEEN THE HISTORICAL ACCURACY OF THE DUKE ENERGY CAROLINAS FORECASTS?

A. There are several ways to examine the historical accuracy. One that I tend to favor is the mean percent error ten years from the date of the forecast. On that basis, the accuracy has been very good. Errors in projected peak loads on a weather normal basis have averaged only 2.7% ten years out. Errors on total energy have been higher, but still at a reasonable level at 9.0%. The higher error rate for energy has been driven by the decline in manufacturing in the Carolinas, something hard to predict ten years in advance.

Q. WHAT HAS BEEN THE COMPANY'S EXPERIENCE DURING THIS BUSINESS CYCLE?

A. In an economic downturn the industrial sector is affected more quickly and more deeply than the residential or commercial sectors. This downturn in particular has had a significant impact on the Duke Energy Carolinas industrial sales. Total industrial sales declined 5.5% in 2008 and are down 15.2% in 2009. All industries have suffered declines but the hardest hit have been textiles, apparel, the transportation sector, and those industries related to housing – such as stone, clay, glass, furniture, and lumber. At this point, we expect continued weakness through 2010.

Q. HAVE YOU REVIEWED THE ELECTRIC LOAD FORECASTS OF OTHER ORGANIZATIONS?

A. Yes.

Q. WHAT RESULTS DID YOU FIND?

A. The Energy Information Administration within the Department of Energy publishes an Annual Energy Outlook ("AEO") each year. The 2009 AEO was released in March 2009, and listed the average annual growth rate for Retail electricity sales for the Southeastern Electric Reliability Council, which includes Duke Energy Carolinas, from 2007 to 2030 to be 0.9%. This is very similar to the 1.0% reported in the Revised 2009 IRP for the average annual growth rate for Retail electricity sales from 2008 to 2029.

Q. HOW DOES DUKE ENERGY CAROLINAS' PROJECTED RATE OF PEAK LOAD GROWTH COMPARE TO ITS HISTORICAL EXPERIENCE?

A. Over the last twenty years, the growth in peak load has been 2.2% per year. Over the last ten years, the growth in peak load was 1.4% per year. The twenty-year historical growth rate is above Duke Energy Carolinas' projected twenty-year native load growth rate of 1.5% per year (excluding the impacts of new energy efficiency programs) and 1.4% per year including the impacts of new energy efficiency programs (both numbers shown on page 35 of the Revised 2009 IRP).

Duke Energy Carolinas relies upon long-term projections of population growth and business activity in developing its estimates of future load growth. These economic projections indicate that the rate of economic and Company load growth are expected to continue at a pace similar to the last ten years. As shown by Witness Mc Murry, although the Company's growth rate has slowed, new resources continue to be needed to meet customer demand. Further, if the economy were to grow at a pace similar to the 2.2% historical long-term rate of growth in retail loads, in twenty years, Duke Energy Carolinas could see peak demands that are more than 3,200 MW higher than currently projected.

III. CONCLUSION

Q. WHAT DO YOU CONCLUDE FROM YOUR REVIEW OF DUKE ENERGY CAROLINAS' LOAD FORECASTS?

A. I am very confident in the reasonableness of the Duke Energy Carolinas' forecasts and I believe they are a reliable basis for preparing the resource plan of the

Company. One must always remember that a forecast is a projection of the future. It is not a projection of something that is known. As a result, variances from the forecast likely will occur. The real issue is whether one can rely on the load forecast as a basis for planning for the future. Therefore, I conclude that the forecasts are reasonable for planning purposes, and the methods used to create them are both reasonable and appropriate.

Q. DOES THAT CONCLUDE YOUR PREPARED TESTIMONY?

A. Yes, it does.

2008 Forecast

Year	Energy	Demand
2008	94,282	18,011
2009	95,552	18,399
2010	96,730	18,730
2011	99,640	19,384
2012	101,637	19,853
2013	102,144	20,017
2014	102,611	20,193
2015	103,717	20,471
2016	105,063	20,769
2017	106,311	21,054
2018	107,315	21,337
2019	108,680	21,625
2020	110,243	21,950
2021	112,127	22,271
2022	114,042	22,568
2023	116,005	22,883
15 Year Growth Rate	1.4%	1.6%

2009 Forecast

Year	Energy	Demand
2009	89,515	17,489
2010	89,315	17,667
2011	90,427	17,994
2012	91,550	18,246
2013	91,946	18,450
2014	93,338	18,791
2015	95,118	19,197
2016	97,205	19,649
2017	98,194	19,867
2018	99,411	20,136
2019	100,776	20,405
2020	102,480	20,705
2021	104,311	21,008
2022	106,306	21,322
2023	108,511	21,657
2024	110,861	22,012
15 Year Growth Rate	1.4%	1.5%

Duke Carolinas Historical and Projected Wholesale Load

	Muncipal/Other Customers[1]	Piedmont EMC[2]	Blue Ridge EMC[3]	Rutherford EMC[4]	NCEMC Supplemental Requirements[5]	Haywood EMC[6]	City of Greenwood[7]	Central[8]
History								
1999	245	67	144	202	NA	NA	66	613
2000	265	69	144	206	NA	NA	62	638
2001	265	76	160	227	NA	15	65	651
2002	287	78	166	239	NA	18	68	719
2003	249	76	159	230	NA	16	66	691
2004	239	80	156	238	NA	18	65	693
2005	278	92	174	251	NA	23	71	815
2006	291	87	178	256	NA	20	67	729
2007	295	97	192	271	NA	24	73	878
2008	274	84	179	268	NA	25	73	818
Forecast								
2009	313	85	183	89	72	22		
2010	316	87	186	89	72	22	69	
2011	318	88	190	277	97	23	70	
2012	321	90	194	282	97	24	70	
2013	323	92	198	285	97	25	71	128
2014	325	93	201	288	97	26	71	259
2015	328	95	205	294	97	26	72	395
2016	330	96	209	298	122	27	72	535
2017	333	97	210	295	122	28	72	680
2018	335	101	217	307	122	29	73	831
2019	338	102	221	312	122	30		940
2020	340	105	225	317	147	30		957
2021	343	108	229	322	147	31		974
2022	346				147			992
2023	348				147			1,010
2024	351				147			1,028
2025	354				147			1,046
2026	357				147			1,064
2027	360				147			1,083
2028	363				147			1,103
2029					147			1,123
	1999 - 2008	1999 - 2008	1999 - 2008	1999 - 2008		2001 - 2008	1999 - 2008	1999 - 2008
Growth Rate	1.3%	2.5%	2.4%	3.2%		7.6%	1.1%	3.3%
	2008 - 2028	2008 - 2021	2008 - 2021	2008 - 2021	2009 - 2029	2008 - 2021	2008 - 2018	2008 - 2029
Growth Rate	1.4%	2.0%	1.9%	1.4%	3.6%	1.7%	0.0%	1.5%

[1]Duke Resale includes the cities of Concord, Kings Mountain, Forest City, Due West, Prosperity and Dallas, the electric company Lockhart and Western Carolina University and the city of Highlands. The contract lengths vary from city to city.

[2]The contract started in 2006 and runs through 2021.

[3]The contract started in 2006 and runs through 2021.

[4]The contract started in 2006 and runs through 2021. Duke's load obligation is supplemental through 2010.

[5]This represents a sale of electricity from Duke to NCEMC. This contract runs through 2038.

[6]The contract started in 2009 and runs through 2021.

[7]The contract starts in 2010 and runs through 2018.

[8]The contract starts in 2013 and runs through 2030.

2008 Forecast

Year	Energy Efficiency Impacts	Energy	Energy Efficiency Impacts	Demand
2008	0	94,282	0	18,011
2009	97	95,455	38	18,361
2010	288	96,442	106	18,624
2011	473	99,167	170	19,214
2012	657	100,980	231	19,622
2013	840	101,304	295	19,722
2014	1,031	101,580	364	19,829
2015	1,215	102,502	427	20,044
2016	1,401	103,662	430	20,339
2017	1,582	104,729	353	20,701
2018	1,773	105,542	422	20,915
2019	1,958	106,722	642	20,983
2020	2,146	108,097	730	21,220
2021	2,228	109,899	352	21,919
2022	2,228	111,814	367	22,201
2023	2,227	113,778	356	22,527
15 Year Growth Rate		1.3%		1.5%

2009 Forecast

Year	Energy Efficiency Impacts	Energy	Energy Efficiency Impacts	Demand
2009	73	89,442	10	17,479
2010	310	89,005	39	17,628
2011	584	89,843	72	17,922
2012	1,015	90,535	125	18,121
2013	1,317	90,629	163	18,287
2014	1,572	91,766	194	18,597
2015	1,919	93,199	236	18,961
2016	2,385	94,820	293	19,356
2017	2,613	95,581	336	19,531
2018	2,859	96,552	366	19,770
2019	3,211	97,565	394	20,011
2020	3,685	98,795	452	20,253
2021	3,817	100,494	483	20,525
2022	3,817	102,489	483	20,839
2023	3,817	104,694	483	21,174
2024	3,826	107,035	468	21,544
15 Year Growth Rate		1.2%		1.4%

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-100, SUB 118
DOCKET NO. E-100, SUB 124

DOCKET NO. E-100, SUB 118	)	
	)	
In the Matter of	)	
Investigation of Integrated Resource	)	
Planning in North Carolina – 2008	)	**DIRECT TESTIMONY OF**
	)	**RICHARD G. STEVIE, Ph.D. FOR**
DOCKET NO. E-100, SUB 124	)	**DUKE ENERGY CAROLINAS, LLC**
	)	
In the Matter of	)	
Investigation of Integrated Resource	)	
Planning in North Carolina – 2009	)	

I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, BY WHOM YOU ARE EMPLOYED, AND IN WHAT CAPACITY.

A. My name is Richard G. Stevie. My business address is 139 E. Fourth St., Cincinnati, Ohio. I am Managing Director of Customer Market Analytics for Duke Energy Business Services LLC ("Duke Energy Business Services"), a wholly-owned service company subsidiary of Duke Energy Corporation ("Duke Energy"). Duke Energy Business Services provides various administrative services to Duke Energy Carolinas, LLC ("Duke Energy Carolinas" or the "Company") and other Duke Energy affiliates including Duke Energy Ohio, Inc., Duke Energy Indiana, Inc., and Duke Energy Kentucky, Inc.

Q. PLEASE BRIEFLY DESCRIBE YOUR DUTIES AND RESPONSIBILITIES AS MANAGING DIRECTOR OF THE CUSTOMER MARKET ANALYTICS DEPARTMENT.

A. I have responsibility for several functional areas including load forecasting, demand side management ("DSM") analysis, customer survey research, market analytics, customer data analysis, load research, and load management analytics. The Customer Market Analytics Department is responsible for providing functional analytical support to Duke Energy Carolinas as well as the other Duke Energy affiliates previously mentioned.

Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL BACKGROUND AND BUSINESS EXPERIENCE.

A. I received a Bachelor's degree in Economics from Thomas More College in May 1971. In June 1973, I was awarded a Master of Arts degree in Economics from the University of Cincinnati. In August 1977, I received a Ph.D. in Economics from the University of Cincinnati.

My past employers include the Cincinnati Water Works where I was involved in developing a new rate schedule and forecasting revenues, the United States Environmental Protection Agency's Water Supply Research Division where I was involved in the research and development of a water utility simulation model and analysis of the economic impact of new drinking water standards, and the Economic Research Division of the Public Staff of the North Carolina Utilities Commission where I presented testimony in numerous utility rate cases involving natural gas, electric, telephone, and water and sewer utilities on several issues including rate of return, capital structure, and rate design. In addition, I was involved in the Public Staff's research effort and presentation of testimony regarding electric utility load forecasting. This included the development of electric load forecasts for the major electric utilities in North Carolina. I also was involved in research concerning cost curve estimation for electricity generation, rate setting, and separation procedures in the telephone industry, and the implications of financial theory for capital structures, bond ratings, and dividend policy. In July 1981, I became the Director of the Economic

Research Division of the Public Staff with the responsibility for the development and presentation of all testimony of the Division.

In November 1982, I joined the Load Forecast Section of The Cincinnati Gas & Electric Company ("CG&E"). My primary responsibility involved directing the development of CG&E's Electric and Gas Load Forecasts. I also participated in the economic evaluation of alternate load management plans and was involved in the development of CG&E's Integrated Resource Plan ("IRP"), which integrated the load forecast with generation options and demand-side options.

With the reorganization after the merger of CG&E and PSI Energy, Inc. in late 1994, I became Manager of Retail Market Analysis in the Corporate Planning Department of Cinergy Services and subsequently General Manager of Market Analysis with responsibility for the load forecasting, load research, DSM impact evaluation, and market research functions of Cinergy Corporation. After the merger of Cinergy Corp. and Duke Energy in 2006, I became the General Manager of the Market Analysis Department with responsibility for several areas including load forecasting, load research, market research, DSM strategy and analysis, load management development, and business development analytics. Since then, I have become the Managing Director of the Customer Market Analytics Department.

Since 1990, I have chaired the Economic Advisory Committee for the Greater Cincinnati Chamber of Commerce. I have been a part-time faculty member of Thomas More College located in Northern Kentucky and the

University of Cincinnati teaching undergraduate courses in economics. In addition, I am an outside adviser to the Applied Economics Research Institute in the Department of Economics at the University of Cincinnati as well as a member of an advisory committee to the Economics Department at Northern Kentucky University.

Q. ARE YOU A MEMBER OF ANY PROFESSIONAL ORGANIZATIONS?

A. Yes, I am a member of the American Economic Association, the National Association of Business Economists, and the Association of Energy Services Professionals.

Q. HAVE YOU PREVIOUSLY PROVIDED TESTIMONY BEFORE ANY REGULATORY AGENCIES?

A. Yes. I have presented testimony on several occasions before the North Carolina Utilities Commission (the "Commission"), the South Carolina Public Service Commission, the Kentucky Public Service Commission, the Indiana Utility Regulatory Commission, and the Public Utilities Commission of Ohio.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. My testimony summarizes actions taken by Duke Energy Carolinas to develop energy efficiency and demand response programs for the "demand side" of the meter. I also describe Duke Energy Carolina's current regulated DSM programs, discuss alternative DSM cases provided to Company Witness Mc Murry for the IRP analysis, and review the impact of Duke Energy Carolinas' DSM programs on the load forecast.

Q. PLEASE DESCRIBE THE EXHIBIT TO YOUR TESTIMONY.

A. Stevie Exhibit No. 1 provides a matrix of the components of each test Duke Energy Carolinas uses to screen energy efficiency measures for cost-effectiveness.

Q. WAS THIS EXHIBIT PREPARED BY YOU OR AT YOUR DIRECTION AND UNDER YOUR SUPERVISION?

A. Yes.

II. ANALYSIS OF ENERGY EFFICIENCY PROGRAMS

Q. HOW WERE DUKE ENERGY CAROLINAS' ENERGY EFFICIENCY PROGRAMS DEVELOPED?

A. Duke Energy Carolinas developed its portfolio of programs in collaboration with interested stakeholders (the "Collaborative"). The energy efficiency and demand-side management programs and measures considered by the Company and the Collaborative included (i) programs already offered and tested by Duke Energy Carolinas' affiliate utility operating companies, (ii) new programs that were recommended to the Collaborative, and (iii) existing programs offered by Duke Energy Carolinas. The Company then analyzed each potential program, applying multiple cost-effectiveness tests using the DSMore Model to compile the list of energy efficiency programs.

The Company's list of energy efficiency and DSM programs are as follows:

RESIDENTIAL CUSTOMER PROGRAMS

- Residential Energy Assessments
- Smart $aver® for Residential Customers
- Low Income Services
- Energy Efficiency Education Program for Schools
- Power Manager

NON-RESIDENTIAL CUSTOMER PROGRAMS

- Non-Residential Energy Assessments
- Smart $aver® for Non-Residential Customers
- PowerShare®

Q. DID DUKE ENERGY CAROLINAS CONDUCT A MARKET POTENTIAL STUDY ON ENERGY EFFICIENCY PROGRAM POTENTIAL?

A. Duke Energy Carolinas commissioned a Market Potential Study in 2007 to ascertain the level of cost-effective energy efficiency that might be achieved.

Q. WHAT IS THE PURPOSE OF THE MARKET POTENTIAL STUDY?

A. The purpose of the Market Potential Study is to provide estimates of the market potential for energy efficiency for Duke Energy Carolinas customers. The study provided estimates of the technical, economic, and market potentials for energy efficiency.

The technical potential is defined as the amount of energy efficiency that could be obtained if all energy efficiency measures were adopted without regard to costs. This level of savings represents the upper limit of energy efficiency opportunity.

The economic potential is defined as the total energy savings available at a specified long-term avoided cost of energy. Measures with levelized costs that are lower than the avoided cost are included in estimates of economic potential.

The market potential is defined as the total energy savings available from all programs recommended in the Market Potential Study, considering cost-effectiveness and adoption rates. In evaluating the market potential, the recommended programs must have passed a rigorous cost-effectiveness review or were recommended for research or societal purposes.

The study was completed and indicated an economic potential for energy efficiency for NC of 19% over the next twenty years and a market potential of 1.6% over the next five years. This means that the market potential for energy efficiency is estimated to be 1.6% of retail sales over the five year period. Even though the economic potential may be 19%, that just means it is cost effective, not that it is actually achievable or that consumers will decide to participate. Consumers have numerous choices to make and the decision on their level of energy efficiency is just one of them. For example, it may be cost-effective for a consumer to buy a new car or to start a new business. Just because it is cost-effective does not mean it happens. That is why the market potential is important – because it is the estimate of what is considered achievable.

One other point to note is that this study was completed before the passage of the Energy Independence and Security Act, which effectively banned incandescent lights. As a result, by the year 2013, the economic potential estimate is slightly overstated.

Q. WHAT IS THE DSMore MODEL?

A. DSMore is a financial analysis tool designed to evaluate the costs, benefits, and risks of energy efficiency programs and measures. DSMore estimates the value of an energy efficiency measure at an hourly level across distributions of weather and/or energy costs or prices. By examining energy efficiency performance and cost-effectiveness over a wide variety of weather and cost conditions, the Company is in a better position to measure the risks and benefits of employing energy efficiency measures versus traditional generation capacity additions, and further, to ensure that demand-side resources are compared to supply-side resources on a level playing field.

The analysis of energy efficiency cost-effectiveness traditionally has focused primarily on the calculation of specific metrics, often referred to as the California Standard tests: Utility Cost Test ("UCT"), Ratepayer Impact Measure ("RIM") Test, Total Resource Cost ("TRC") Test, Participant Test, and Societal Test. DSMore provides the results of those tests for any type of energy efficiency program (demand response and/or energy saving).

The test results are provided for a range of weather conditions, including normal weather, and under various cost and market price conditions. Because DSMore is designed to be able to analyze extreme conditions, one can obtain a distribution of cost-effectiveness outcomes or expectations. Avoided costs for energy efficiency tend to increase with increasing market prices or more extreme weather conditions as a result of the covariance between load and costs. Understanding the manner in which energy efficiency cost-effectiveness varies

under these conditions allows a more precise valuation of energy efficiency programs and demand response programs.

Generally, the DSMore model requires the user to input specific information regarding the energy efficiency measure or program to be analyzed as well as the cost and rate information of the utility. These inputs enable one to then analyze the cost-effectiveness of the measure or program.

III. MODEL ASSUMPTIONS

Q. WHAT ENERGY EFFICIENCY AND DEMAND-SIDE MANAGEMENT PROGRAM OR MEASURE INFORMATION IS INPUT INTO THE MODEL?

A. The information required on an energy efficiency or demand-side management program or measure includes, but is not limited to:

- Number of program participants, including free ridership or free drivers
- Projected program costs, contractor costs, and/or administrative costs
- Customer incentives, demand-side management credits, or other incentives
- Measure life, incremental customer costs, and/or annual maintenance costs
- Load impacts (kWh, kW, and the hourly timing of reductions)
- Hours of interruption, magnitude of load reductions, or load floors

Q. WHAT UTILITY INFORMATION IS INPUT INTO THE MODEL?

A. The utility information required for the model includes, but is not limited to:

- Discount rate
- Loss ratio, either for annual average losses or peak losses

- Rate structure or tariff appropriate for a given customer class
- Avoided costs of energy, capacity, transmission & distribution
- Cost escalators

Q. HOW ARE PROGRAMS OR MEASURES MODELED?

A. An analyst or program manager develops the inputs for the program or measure using information on expected program costs, load impacts, customer incentives necessary to drive customers' participation, free rider expectations, and expected number of participants. This information is used in initial runs of the model to determine cost-effectiveness and whether adjustments need to be made to a program or measure in order for it to pass the participant test, the first critical test.

Then, the load impacts of the program or measure may be analyzed as a percent of savings reduction from the current level of use, as a proportion of the load shape for the customer, or as an hourly reduction in kWh and/or kW. These approaches apply to energy saving programs and measures. For demand-side management programs, the analyst must provide information on the amount of the expected load reduction and the possible timing of the reduction.

Q. WHAT IS THE SOURCE OF THE DATA FOR THE PROGRAM OR MEASURE?

A. Program managers and analysts develop the inputs for each program or measure from industry information derived from sources such as Electric Power Research Institute, Energy Star, E-Source, other utility program information, as well as from external experts in the industry. Over time, as impact and process evaluations are performed on Duke Energy Carolinas program results,

information and input specifically related to Duke Energy Carolinas customers will begin to emerge and be used within future cost-effectiveness analyses.

Q. WHAT IS THE SOURCE FOR THE UTILITY INPUTS TO THE MODEL?

A. All of the utility inputs are the same as those used in the analyses for the save-a-watt set of programs reviewed in Docket No. E-7, Sub 831. This includes the loss ratio, the discount rate, and the estimates for avoided costs of capacity, energy, and transmission and distribution.

IV. COST-EFFECTIVENESS TESTS

Q. PLEASE DESCRIBE HOW ENERGY EFFICIENCY AND DEMAND-SIDE MANAGEMENT PROGRAMS AND MEASURES ARE ANALYZED.

A. The net present value of the financial stream of costs versus benefits is assessed, *i.e.*, the costs to implement the measures are valued against the savings or avoided costs. The resultant benefit/cost ratios, or tests, provide a summary of the measure's cost-effectiveness relative to the benefits of its projected load impacts. As previously mentioned, the Participant Test is the first screen for a program or measure to make sure a program makes economic sense for the individual consumer. Duke Energy Carolinas also uses the UCT, the TRC, and the RIM Test for screening energy efficiency measures.

- The Participant Test compares the benefits to the participant through bill savings and incentives from the utility, relative to the costs to the participant for implementing the energy efficiency or demand-side management measure. The costs can include capital cost as well as increased annual operating cost, if applicable.

- The UCT compares utility benefits (avoided costs) relative to incurred utility costs to implement the program, and does not consider other benefits such as participant savings or societal impacts. This test compares the cost (to the utility) to implement the measures with the savings or avoided costs (to the utility) resulting from the change in magnitude and/or the pattern of electricity consumption caused by implementation of the program. Avoided costs are considered in the evaluation of cost-effectiveness based on the projected cost of power, including the projected cost of the utility's environmental compliance for known regulatory requirements. The cost-effectiveness analyses also incorporate avoided transmission and distribution costs, and load (line) losses.
- The TRC test compares the total benefits to the utility and to participants relative to the costs to the utility to implement the program along with the costs to the participant. The benefits to the utility are the same as those computed under the UCT. The benefits to the participant are the same as those computed under the Participant Test; however, customer incentives are considered to be a pass-through benefit to customers. As such, customer incentives or rebates are not included in the TRC.
- The RIM Test, or non-participants test, indicates if rates increase or decrease over the long-run as a result of implementing the program.

The use of multiple tests can ensure the development of a reasonable set of energy efficiency and demand-side management programs, indicate the likelihood

that customers will participate, and also protect against cross-subsidization. Stevie Exhibit No. 1 provides a matrix of the components included in each test. It also should be noted that none of the tests described above include external benefits to participants and non-participants that can also offset the costs of the programs.

Q. WHAT WERE THE RESULTS OF THE PROGRAM COST-EFFECTIVENESS ANALYSES?

A. The table attached below contains the cost-effectiveness test results for each program. These cost-effectiveness tests incorporate the avoided energy costs previously discussed. In general, the customer programs pass the UCT and TRC cost-effectiveness tests, but not the RIM test. For the residential and non-residential customer programs, all measures tested are included in the programs.

Program Cost Effectiveness Test Results

	Utility Test	TRC Test	RIM Test	Participant Test
RESIDENTIAL CUSTOMER PROGRAMS				
• Residential Energy Assessments	2.56	2.56	0.74	NA
• Residential Smart Saver® Energy Efficiency	3.33	2.48	0.79	5.32
• Low Income Services Agency Kits	5.74	5.74	0.84	NA
• Low Income Weatherization	0.37	0.37	0.28	NA
• Energy Efficiency Education Program for Schools	3.10	3.10	0.82	NA
• Power Manager	7.55	145.01	7.55	NA
NON-RESIDENTIAL CUSTOMER PROGRAMS				
• Non-Residential Energy Assessments	NA	NA	NA	NA
• Smart Saver® for Non-Residential Customers	2.85	1.79	1.12	2.41
• Power Share®	4.23	124.12	4.23	NA

V. ENERGY EFFICIENCY AND DEMAND-SIDE MANAGEMENT

Q. PLEASE BRIEFLY DESCRIBE DUKE ENERGY CAROLINAS' CURRENT ENERGY EFFICIENCY AND DSM PROGRAMS.

A. Duke Energy Carolinas is pursuing the implementation of the following set of programs, which were approved by the Commission in Docket No. E-7, Sub 831:

- **Residential Energy Assessments**
  --Offers energy audits to residential customers on-site, on-line, or through the mail.

- **Low Income Services**
  --Assists low income residential customers with energy efficiency kits or assistance with equipment cost or weatherization measures.

- **Energy Efficiency Education Program for Schools**
  --Educates students about energy efficiency in homes and schools and provides energy audits.

- **Smart $aver® for Residential Customers**
  --Provides incentives for the installation of energy efficiency equipment such as air conditioners, heat pumps, and compact fluorescent lights.

- **Non-Residential Energy Assessments**
  --Assists non-residential customers in assessing their energy usage and provides recommendations for improved efficiency.

- **Smart $aver® for Non-Residential Customers**
  --Provides incentives to offset a portion of the higher cost of energy efficiency equipment in new and existing non-residential establishments. Incentives may also be provided for non-standard equipment on a case-by-case basis.

Duke Energy Carolinas is pursuing the implementation of demand-side management programs through offering the following programs:

- **Power Manager Program**
  --Provides billing credits to residential customers for the ability to cycle air conditioners and to interrupt central air conditioning when the Company has a capacity need.

- **Power Share® Program**
  --Provides capacity based incentives to non-residential customers for the amount of load they agree to curtail during utility-initiated emergency events. Energy credits are also provided for curtailed load from an event.

Duke Energy Carolinas also continues to utilize load reduction capability obtained under Riders IS and SG (North Carolina only) and Rate HP (Hourly Pricing).

Q. ARE THE CURRENT ENERGY EFFICIENCY AND DSM PROGRAMS THE BASIS FOR THE LOAD IMPACTS UTILIZED BY COMPANY WITNESS MC MURRY IN HIS ANALYSES?

A. Yes. The projected impacts from the current programs represent the Base Case load impacts provided to Mr. Mc Murry for use in his analyses. The projected energy efficiency and DSM impacts assume that the current set of DSM programs remain in place over the forecast horizon. It should be mentioned that the Base Case relies upon the bundle of programs approved under the Company's save-a-watt energy efficiency program. Those programs have been approved by the Commission for a four-year period. Under the Base Case, it is assumed that the energy efficiency 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 witness Mc Murray's analysis.

This 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.

The approach for the Base Case is the same for the 2008 and 2009 plans. However, for the development of the 2009 IRP (as originally filed on September 1, 2009 and as updated with the filing of this testimony ("Revised 2009 IRP")) the projection of energy efficiency impacts differs for three 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 energy efficiency impacts were scaled up in the third and fourth years to be consistent with the requirements of the settlement agreement in the recently completed proceeding on the Company's save-a-watt recovery mechanism. However, also consistent with that agreement, it was assumed that the Company would include eighty-five percent of the revenue requirements in the computation of the recovery rider. As a result, for the Base Case, the Company included eighty-five percent of the projected load impacts. And 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 results in a reduction in the level of energy efficiency peak savings projected for the Revised 2009 IRP as compared to the 2008 IRP. A summary of the Base Case projected energy efficiency load impacts is provided on page 47 of the Revised 2009 IRP.

Q. REGARDING THE COMMISSION'S NOTICE OF DECISION IN DOCKET NO. E-7, SUB 831, PLEASE SUMMARIZE THE COMMISSION'S REQUEST OF THE COMPANY FOR THIS PROCEEDING.

A. The Commission requested that "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."

Q. WHAT ARE DUKE ENERGY CAROLINAS' EE AND DSM GOALS RELATIVE TO THE IMPACTS INCLUDED IN THE 2009 IRP?

A. In Docket No. E-7, Sub 831, the Company proposed the following goals for the first four years of the save-a-watt program:

	EE and DSM Goals	
	Docket No.E-7, Sub 832	
	EE MWH	EE & DSM MW
Year 1	234,132	368
Year 2	490,634	548
Year 3	872,548	736
Year 4	1,439,742	844

It is important to understand that these MWh goals represent annualized levels of impacts. In other words, this means that the customer participants in the energy efficiency programs are on-line the full year. The use of annualized levels is an outfall of the modeling process that assesses cost-effectiveness of the annual participants and impacts.

For the IRP, participants and load impacts are assumed to escalate linearly through the year to better align impacts when they are likely to happen. As a result, the full number of participants and the annual run rate of impacts are not reached until the end of the year, instead of assumed to be there all year long. In other words, on an annual basis, the number of participants and the load impacts reflected in the IRP will represent roughly a mid-year level of the impacts in the goals.

Another complicating factor affecting a comparison between the IRP and the goals is that the Company began implementing the programs in the middle of 2009. The year 2010 is the first full year during which the programs will have been in place. For the Revised 2009 IRP, the cumulative impact value for 2010 reported on page 47 includes the partial year impacts from 2009. The table below provides a quick summary for the Base Case.

	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.		

This data demonstrates that the Base Case peak MW impacts in the IRP analysis align closely with the goals previously provided and that the MWh impacts follow the goals for the first three years. The fourth year goal is above the impacts in the IRP and falls between the IRP MWh impacts for 2013 and 2014. This shift can occur due to differences in the way impacts are assumed to increase within each year, linear growth through the year in the IRP versus a full annual value.

Q. DID YOU ALSO PREPARE AN ALTERNATE FORECAST OF ENERGY EFFICIENCY IMPACTS?

A. Yes. I prepared an alternate High Case energy efficiency impact forecast. For the High Case energy efficiency forecast, I assumed that the level of energy efficiency impacts initially follow the Base Case for the first five years but then increase at the rate of 1% of retail sales each year until the economic potential is reached as estimated in the Company's energy efficiency market potential studies. The table below provides the forecast of impacts for this High Case:

	EE and DSM High Case Load Impacts in IRP (1)	
	EE MWH	EE & DSM MW
2010	309,917	416
2011	687,711	656
2012	1,193,800	836
2013	1,317,350	852
2014	1,572,072	883
2015	2,098,426	947
2016	2,698,371	1,020
2017	3,299,643	1,114
2018	3,922,556	1,191
2019	4,638,791	1,259
2020	5,360,536	1,346
(1) Excludes impacts from IS and SG.		

This table demonstrates how much faster the MWh and MW impacts would increase under the assumptions of the High Case. A more detailed summary of the High Case projected energy efficiency load impacts is provided on page 48 of the Revised 2009 IRP.

Q. HOW DO THESE PROJECTIONS AFFECT THE FORECAST OF LOAD?

A. These projected EE and DSM impacts are included in the IRP analysis. Doing so essentially reduces the load forecast for these projected impacts.

VI. CONCLUSION

Q. DOES THAT CONCLUDE YOUR PREPARED TESTIMONY?

A. Yes, it does.

BENEFIT/COST TEST MATRIX					
Benefits:	Participant Test	Utility Test	Ratepayer Impact Test	Total Resource Test	Societal Test
Customer Electric Bill Decrease	X				
Customer Non-electric Bill Decrease	X				
Customer O&M and Other Cost Decrease	X			X	X
Customer Income Tax Decrease	X			X	
Customer Investment Decrease	X			X	X
Customer Rebates Received	X				
Utility Revenue Increase			X		
Utility Electric Production Cost Decrease		X	X	X	X
Utility Generation Capacity Credit		X	X	X	X
Utility Transmission Capacity Credit		X	X	X	X
Utility Distribution Capacity Credit		X	X	X	X
Utility Administrative Cost Decrease		X	X	X	X
Utility Cap. Administrative Cost Decrease		X	X	X	X
Non-electric Acquisition Cost Decrease				X	X
Utility Sales Tax Cost Decrease		X	X	X	
Costs:					
Customer Electric Bill Increase	X				
Customer Non-electric Bill Increase	X			X	
Customer O&M and Other Cost Increase	X			X	X
Customer Income Tax Increase	X			X	
Customer Capital Investment Increase	X			X	X
Utility Revenue Decrease			X		
Utility Electric Production Cost Increase		X	X	X	X
Utility Generation Capacity Debit		X	X	X	X
Utility Transmission Capacity Debit		X	X	X	X
Utility Distribution Capacity Debit		X	X	X	X
Utility Rebates Paid		X	X		
Utility Administrative Cost Increase		X	X	X	X
Utility Cap. Administrative Cost Increase		X	X	X	X
Non-electric Acquisition Cost Increase				X	X
Utility Sales Tax Cost Increase		X	X	X	

Benefit/Cost Ratio = Total Benefits/Total Costs

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-100, SUB 118
DOCKET NO. E-100, SUB 124

DOCKET NO. E-100, SUB 118 In the Matter of Investigation of Integrated Resource Planning in North Carolina – 2008 DOCKET NO. E-100, SUB 124 In the Matter of Investigation of Integrated Resource Planning in North Carolina – 2009	**DIRECT TESTIMONY OF OWEN A. SMITH FOR DUKE ENERGY CAROLINAS, LLC**

I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Owen A. Smith, and my business address is 526 South Church Street, Charlotte, North Carolina.

Q. WHAT IS YOUR POSITION WITH DUKE ENERGY CORPORATION?

A. I am Managing Director, Renewable Strategy & Compliance for Duke Energy Corporation ("Duke Energy").

Q. PLEASE BRIEFLY SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL AFFILIATIONS.

A. I received a Bachelor of Arts from East Carolina University and a Master's degree in Business Administration from Wake Forest University. I serve on the Boards of Directors of the Solar Electric Power Association ("SEPA") and Palmetto Clean Energy, Inc. ("PaCE").

Q. PLEASE DESCRIBE YOUR BUSINESS BACKGROUND AND EXPERIENCE.

A. I joined Duke Energy in 2002 as a Commercial Associate. I have held positions in Corporate Strategy, Treasury, Mergers & Acquisitions, Market Research, and Renewable Energy Strategy. I assumed my current position in August 2008.

Q. WHAT ARE YOUR RESPONSIBILITIES IN YOUR CURRENT POSITION?

A. I am responsible for the development and execution of strategies related to renewable energy requirements for Duke Energy's regulated utility businesses, including Duke Energy Carolinas, LLC ("Duke Energy Carolinas" or the

"Company") and our utility operating companies in Indiana, Ohio, and Kentucky. This includes pursuing renewable generation initiatives, customer programs, and compliance with renewable energy requirements.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE NORTH CAROLINA UTILITIES COMMISSION?

A. Yes, I recently appeared to present testimony in support of Duke Energy Carolinas' Application for Approval of REPS Cost Recovery in Docket No. E-7, Sub 872 and filed testimony in support of the Joint Motion of Progress Energy Carolinas, Inc., Duke Energy Carolinas, Dominion North Carolina Power, North Carolina Electric Membership Corporation, North Carolina Eastern Municipal Power Agency and North Carolina Municipal Power Agency Number 1 (collectively "the Electric Power Suppliers") to request the Commission to modify the swine and poultry waste resource requirements of N.C. Gen. Stat. §§ 62-133.8 (e) and (f), in Docket No. E-100, Sub 113 ("Joint Motion").

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. My testimony is offered to describe Duke Energy Carolinas' 2009 Renewable Energy and Energy Efficiency Portfolio Standards ("REPS") Compliance Plan, filed in this docket on September 1, 2009 pursuant to N.C. Gen. Stat. § 62-133.8 and Commission Rule R8-67(b), and the activities taken by the Company in furtherance of that Plan and in support of its compliance with North Carolina's REPS under N.C. Gen. Stat. § 62-133.8.

Q. PLEASE DESCRIBE THE EXHIBIT TO YOUR TESTIMONY.

A. Smith Exhibit No. 1 provides a forecast of Duke Energy Carolinas' REPS obligations for the period 2010-2022.

Q. WAS THIS EXHIBIT PREPARED BY YOU OR AT YOUR DIRECTION AND UNDER YOUR SUPERVISION?

A. Yes.

II. DUKE ENERGY CAROLINAS' 2009 REPS COMPLIANCE PLAN

Q. WHAT ARE DUKE ENERGY CAROLINAS' REPS OBLIGATIONS UNDER N.C. GEN. STAT. § 62-133.8?

A. Under Section 62-133.8(b)(1), each electric public utility in the State must comply with the REPS requirement in accordance with a statutorily set schedule beginning in the year 2012 based upon 3% of the utility's North Carolina retail sales. The schedule escalates to 6% in 2015, 10% in 2018 and 12.5% in 2021 and thereafter. Additionally, beginning with the year 2010, Section 62-133.8(d) further requires that each electric public utility satisfy its REPS requirement with solar energy (the "Solar Set Aside"). The Solar Set Aside similarly requires compliance in accordance with a statutorily set schedule beginning in the year 2010 based upon 0.02% of the utility's North Carolina retail sales. The schedule escalates to 0.07% in 2012, 0.14% in 2015 and 0.20% in 2018 and thereafter.

In its *Order Clarifying Electric Power Suppliers' Annual REPS Requirements*, issued on November 26, 2008, in Docket No. E-100, Sub 113, the Commission clarified that the calculation of these requirements for each year shall be based upon the electric utility's North Carolina retail sales for the prior year.

Additionally, the Commission has ordered that compliance with the swine and poultry waste set-aside requirements of N.C. Gen. Stat 62-133.8 is an aggregate obligation of Electric Suppliers.[1] As a result of the Commission's Order, Duke Energy Carolinas is planning collaborative efforts with other Electric Suppliers in North Carolina to comply with the aggregate requirements for swine waste and poultry waste renewable resources. A forecast of Duke Energy Carolinas' REPS obligations for the period 2010 through 2022 is attached as Smith Exhibit No. 1.

In addition to its REPS obligations arising from its retail operations, Duke Energy Carolinas plans to provide services to wholesale customers that contract with the Company for services to meet the REPS requirements. These services include delivery of renewable energy resources and compliance planning and reporting. These wholesale customers, including electric membership corporations, municipalities, and other wholesale customers, may rely on Duke Energy Carolinas to provide this renewable energy delivery service in accordance with N.C. Gen. Stat. §62-133.8(c)(2)e. The Company's 2009 REPS Compliance Plan, filed in this docket on September 1, 2009, provides the information required by Commission Rule R8-67(c) in aggregate for the Company and the following wholesale customers for whom the Company will provide renewable energy resources and compliance reporting services: Rutherford Electric Membership Corporation, City of Dallas, Forest City, City of Concord, Town of Highlands, and City of Kings Mountain ("Wholesale"). Unless otherwise stated, the requirements that are described in this testimony and accompanying exhibit

[1] *Order on Duke Energy Carolinas, LLC, Motion for Clarification*, Docket No. E-100, Sub 113 (May 7, 2009).

reflect the aggregation of the requirements for Duke Energy Carolinas retail customers and these Wholesale customers. The Company also is involved in discussions with certain other customers and may elect to provide renewable resources and compliance reporting services to these additional customers, but as of this date the above referenced list of customers remain the only ones that the Company has reflected in its compliance plans.

Q. WHAT IS DUKE ENERGY CAROLINAS' OVERALL STRATEGY FOR REPS COMPLIANCE?

A. In developing the Company's 2009 REPS Compliance Plan filed with its 2009 Integrated Resource Plan ("IRP") in Docket No. E-100, Sub 124, Duke Energy Carolinas has focused on a balanced, diversified approach of utilizing: (1) existing or new Duke Energy Carolinas-owned generation assets, (2) the purchase of energy from renewable energy resources available in the market through power purchase agreements ("PPAs"), and (3) the purchase of unbundled renewable energy certificates ("RECs") from both in-state and out-of-state suppliers to satisfy its REPS requirement. Duke Energy Carolinas also sees great potential value in maximizing the opportunity to use cost-effective energy efficiency savings as part of its REPS compliance strategy. Company Witness Stevie discusses the Company's portfolio of energy efficiency and demand side management programs and projected megawatt hour reductions from such programs.

Q. WHAT STEPS HAS DUKE ENERGY CAROLINAS' TAKEN TO PROCURE OR DEVELOP RENEWABLE ENERGY RESOURCES IN ORDER TO SATISFY THE REQUIREMENTS OF N.C. GEN. STAT. § 62-133.8?

A. In seeking to build a diversified portfolio of renewable and energy efficiency resources, the Company has undertaken several key efforts, including (1) seeking proposals from various potential renewable suppliers for either PPAs or REC purchase agreements, (2) evaluating opportunities to make direct investments in the ownership and/or operation of renewables, (3) developing programs such as a Standard Offer for RECs to facilitate procurement of RECs from smaller producers, and (4) making regulatory applications to pursue specific initiatives such as the Company's Distributed Generation Solar Photovoltaic "PV" program, approved in Docket No. E-7, Sub 856[2] or the Company's energy efficiency program, approved in Docket No. E-7, Sub 831. With respect to utility-owned assets, the Company has begun implementing the certificate of public convenience and necessity granted by the Commission in Docket No. E-7, Sub 856 for Duke Energy Carolinas' Solar DG Program, and conducted tests and analysis of co-firing biomass fuels and re-powering at certain of the Company's coal-fired units. The Company also is moving forward in its development of a coastal wind demonstration project in the Pamlico Sound, which may include up to three (3) turbines and could provide up to fifteen (15) MW in total capacity. The Company believes these actions collectively constitute a thorough and

[2] See *Order Granting Certificate of Public Convenience and Necessity Subject to Conditions*, Docket No. E-7, Sub 856 (December 28, 2008) and *Order on Reconsideration* (May 6, 2009).

prudent plan for compliance with the REPS law and demonstrate the Company's commitment to pursue its renewable energy and energy efficiency strategies. The Commission has approved Duke Energy Carolinas' execution of its compliance planning, as it has approved the Company's initial REPS Compliance Report and application for REPS cost recovery pursuant to N.C. Gen. Stat. § 62-133.8(h). In its *Order Approving Cost Recovery and Directing Further Proceedings Regarding REPS Riders*, Docket E-7, Sub 872 (August 21, 2009), the Commission concluded that "Duke has diligently pursued its REPS obligations in acquiring a portfolio of RECs from existing or new Duke-owned resources, the purchase of energy from renewable resources available in the market, and the purchase of RECs."

Q. PLEASE DESCRIBE DUKE ENERGY CAROLINAS' BID EVALUATION PROCESS FOR RENEWABLES.

A. Duke Energy Carolinas evaluates renewable proposals based on (1) economic analysis, (2) risk of project execution, and (3) analysis of other factors.

In the case of proposals involving the delivery of electrical energy to the Company's control area, economic analysis involves a life-cycle benefit-cost approach by which renewable resources are valued on the basis of their cost relative to the combination of their energy value, capacity value, and environmental value arising from avoided emissions.

In the case of REC purchase agreements, economic analysis involves the comparison of offered REC prices to (1) REC prices offered by other providers; and (2) implied REC prices arising from proposals involving the delivery of

electrical energy to the Company's control area, where the implied REC price is the cost of the renewable PPA that exceeds the Company's avoided cost.

Analysis of project execution risk involves an evaluation of potential risk factors including owner/operator experience, whether the proposed technology is proven and reliable, the status of the project being proposed (such as status of required permits, site control, and financing), access to transmission or distribution, and credit quality.

Finally, other factors that are considered include but are not limited to dispatch flexibility, deliverability, the mix of renewable resources, and location of the projects.

Once proposals have been evaluated using the methodology described above, the most attractive proposals are identified, and based on the Company's projected need for additional resources, the Company then proceeds to negotiate with those bidders. This evaluation process is one that the Company feels is reasonable and prudent in that it enables the Company to maintain a disciplined approach to identifying and engaging in negotiations for the most attractive renewable opportunities.

Q. HAS DUKE ENERGY CAROLINAS DEVELOPED AND IMPLEMENTED PLANS TO COMPLY WITH THE REPS SWINE AND POULTRY WASTE SET-ASIDE REQUIREMENTS OF N.C. GEN. STAT. § 62-133.8(e) AND (f)?

A. Yes. Duke Energy Carolinas has not included such plans in its 2009 REPS Compliance Plan because the initial swine and poultry waste set aside

requirements occur in 2012, which is outside of the planning horizon for this year's plan. Additionally, uncertainties remain regarding the swine and poultry waste aggregate statewide set-aside requirements for 2012, including Duke Energy Carolinas' respective procurement obligation of the aggregate statewide requirements. The Company continues to work with the other Electric Power Suppliers and swine and poultry waste generation resource providers to resolve those issues raised by the Joint Motion, and to reach agreements to procure energy or RECs to satisfy its statutory obligations for swine and poultry waste generation.

That being said, the Company has engaged in numerous activities designed to identify renewable energy and REC purchase opportunities to satisfy its statutory swine and poultry waste set-aside obligations for 2012 and beyond. Despite the fact that the Company does not have a specific obligation within the aggregate state-wide set-aside requirements, Duke Energy Carolinas has endeavored to secure swine waste and poultry waste resources through a variety of methods. Specifically, in addition to those general resource and REC procurement methods identified above, Duke Energy Carolinas has (1) engaged in joint discussions with the other Electric Power Suppliers regarding the development of swine waste resources through the issuance of a state-wide RFP; (2) engaged in direct negotiations with multiple power suppliers regarding bundled power supply and REC purchase agreements from proposed poultry waste generation facilities; (3) engaged in direct negotiations with potential suppliers regarding REC purchase agreements from proposed swine waste

generation facilities; and (4) actively explored research and development projects relating to innovative swine and poultry waste generation technologies.

III. CONCLUSION

Q. DO YOU BELIEVE THAT DUKE ENERGY CAROLINAS' 2009 REPS COMPLIANCE PLAN WILL ENABLE IT TO MEET ALL OF ITS STATUTORY OBLIGATIONS IN THE REPS PLANNING HORIZON?

A. Duke Energy Carolinas intends to meet its statutory REPS requirements and its 2009 REPS Compliance Plan provides the operating blueprint for it to achieve compliance over the planning horizon. The Company's resource evaluation and plan implementation activities to date have enabled it to develop a solid understanding of market pricing and other considerations regarding renewable resources, both within and outside of North Carolina. Based upon this market knowledge and analysis, as well as other considerations associated with various types of renewable energy resources, the Company has designed and developed its REPS Compliance Plan to meet its general and set aside REPS obligations under N.C. Gen. Stat. § 62-133.8 utilizing the most appropriate and cost-effective resources.

Q. DOES THIS CONCLUDE YOUR PREPARED TESTIMONY?

A. Yes.

REPS GENERATION (MWh)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Total Solar Reqm't	11,211	10,986	38,686	39,070	39,072	78,714	79,643	80,477	116,588	118,429	120,299	122,142	124,572	127,297	130,285	133,457	136,748	140,137	143,626
Total Swine Reqm't	*0*	*0*	*38,686*	*39,070*	*39,072*	*78,714*	*79,643*	*80,477*	*116,588*	*118,429*	*120,299*	*122,142*	*124,572*	*127,297*	*130,285*	*133,457*	*136,748*	*140,137*	*143,626*
Total Poultry Reqm't	0	0	76,452	314,801	404,744	404,744	404,744	404,744	404,744	404,744	404,744	404,744	404,744	404,744	404,744	404,744	404,744	404,744	404,744
Total Carve Out Requirement	11,211	10,986	153,823	392,941	482,888	562,172	564,029	565,698	637,919	641,603	645,342	649,028	653,887	659,337	665,313	671,658	678,240	685,017	691,995
Total REPS Requirement	11,211	10,986	1,657,958	1,674,434	1,674,533	3,373,458	3,413,257	3,449,029	5,829,396	5,921,474	6,014,953	7,563,429	7,714,012	7,883,037	8,068,436	8,265,386	8,469,674	8,680,054	8,896,665

*Requirements based on recent sales forecast and adjusted to incorporate wholesale customer requirements.
*NC REPS specifies the swine and poultry requirements only at the state wide level. For purposes of this exhibit, an estimate of the Company's pro-rata share of the state obligation is shown.

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-100, SUB 118
DOCKET NO. E-100, SUB 124

DOCKET NO. E-100, SUB 118	)	
	)	
In the Matter of	)	
Investigation of Integrated Resource	)	
Planning in North Carolina – 2008	)	**DIRECT TESTIMONY OF**
	)	**ROBERT A. MC MURRY FOR**
DOCKET NO. E-100, SUB 124	)	**DUKE ENERGY CAROLINAS, LLC**
	)	
In the Matter of	)	
Investigation of Integrated Resource	)	
Planning in North Carolina – 2009	)	

I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Robert A. Mc Murry, and my business address is 526 South Church Street, Charlotte, North Carolina.

Q. WHAT IS YOUR POSITION WITH DUKE ENERGY CORPORATION?

A. I am Director, Integrated Resource Planning ("IRP") for Duke Energy Carolinas, LLC ("Duke Energy Carolinas" or the "Company"). Duke Energy Carolinas is a wholly-owned subsidiary of Duke Energy Corporation ("Duke Energy").

Q. PLEASE BRIEFLY SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL AFFILIATIONS.

A. I am a civil engineer, having received a Bachelor of Science in Engineering from the University of North Carolina at Charlotte. I am a registered Professional Engineer in North Carolina and South Carolina and a member of American Society of Civil Engineering.

Q. PLEASE DESCRIBE YOUR BUSINESS BACKGROUND AND EXPERIENCE.

A. I began my career at Duke Power Company (now known as Duke Energy Carolinas) in 1982 and have had a variety of responsibilities across the Company in areas of structural design, environmental strategy, allowance management and resource planning. I assumed my current position in March 2008.

Q. WHAT ARE YOUR RESPONSIBILITIES IN YOUR CURRENT POSITION?

A. I have responsibility for integrated resource planning for Duke Energy Carolinas. In that role, I oversee long-term resource planning and the short term action plan that supports long term decisions.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE NORTH CAROLINA UTILITIES COMMISSION?

A. No. I have not appeared before the Commission, however, I previously filed direct testimony In The Matter of Consideration Certain Standards for Electric Utilities Related to Integrated Resource Planning, Rate Design Modifications to Promote Energy Efficiency Investments, Smart Grid Investments, and Smart Grid Information Pursuant to the Energy Independence and Security Act of 2007, Docket No. E-100, Sub 123.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to discuss the IRP process, to describe and support any portions of the 2009 Duke Energy Carolinas IRP that represent changes from the Company's 2008 IRP filed in Docket No. E-100, Sub 118, and to support the conclusions contained in the 2009 Duke Energy Carolinas IRP, as initially filed in this docket on September 1, 2009 and as filed with revisions concurrently with this testimony on January 11, 2010 ("Revised 2009 IRP"). In addition, my testimony addresses the requirements set forth in the Commission's *Order on Advance Notice* in Docket No. E-7, Sub 923 and *Notice of Decision* in Docket No. E-7, Sub 831.

Q. PLEASE DESCRIBE THE REQUIREMENTS SET FORTH IN THE COMMISSION'S *ORDER ON ADVANCE NOTICE* IN DOCKET NO. E-7, SUB 923 AND *NOTICE OF DECISION* IN DOCKET NO. E-7, SUB 831 AS TO THE IRP.

A. Pursuant to the Commission's *Order on Advance Notice* in Docket No. E-7, Sub 923, Duke Energy Carolinas is required to present revisions to its 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;

(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.

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 include in its Revised 2009 IRP the most recent and appropriate information regarding its energy efficiency and demand side management goals.

Q. HOW ARE THESE REQUIREMENTS ADDRESSED IN THE REVISED 2009 IRP?

A. Each of the individual requirements of the Commission's *Order on Advance Notice* in Docket No. E-7, Sub 923 and *Notice of Decision* in Docket No. E-7, Sub 831 is addressed in Appendix F of the Revised 2009 IRP.

Q. WHAT IMPACT DO THESE REQUIREMENTS, AS DESCRIBED IN APPENDIX F TO THE REVISED 2009 IRP, HAVE ON THE REVISED 2009 IRP RESOURCE PLAN?

A. The inclusion of the Central load as a firm requirement, and the undesignated load associated with wholesale customers we have a reasonable expectation to serve, increased the need of combustion turbine generation in the 2017 and 2026 timeframe. Also, the inclusion of these wholesale customers further supports the need for Lee Nuclear in the 2018 to 2021 timeframe.

Q. PLEASE PROVIDE AN OVERVIEW OF THE INTEGRATED RESOURCE PLANNING PROCESS FOR THE DUKE ENERGY CAROLINAS REVISED 2009 IRP.

A. The IRP Planning process begins with a 20-year load forecast. The forecast includes projections of summer and winter peak demands, as well as energy use. Information is gathered for Duke Energy Carolinas' existing resources, including Company-owned generation, purchased power agreements, and demand-side/energy efficiency resources. The information includes items such as capacity rating, heat rate, fuel

costs and emission allowance costs. Data is gathered on the costs of additional resource options to meet customer needs. Such data includes lead times for construction, capacity costs, fixed and variable operating and maintenance costs and emissions costs for generation, as well as the costs of demand-side options. Quantitative analyses are conducted to identify combinations of options that will meet customer energy needs (plus reserve margin) while minimizing the costs to customers. The Revised 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. These quantitative analyses enable the Company to identify potential portfolios that can be tested under base assumptions, and for sensitivities and scenarios around those base assumptions.

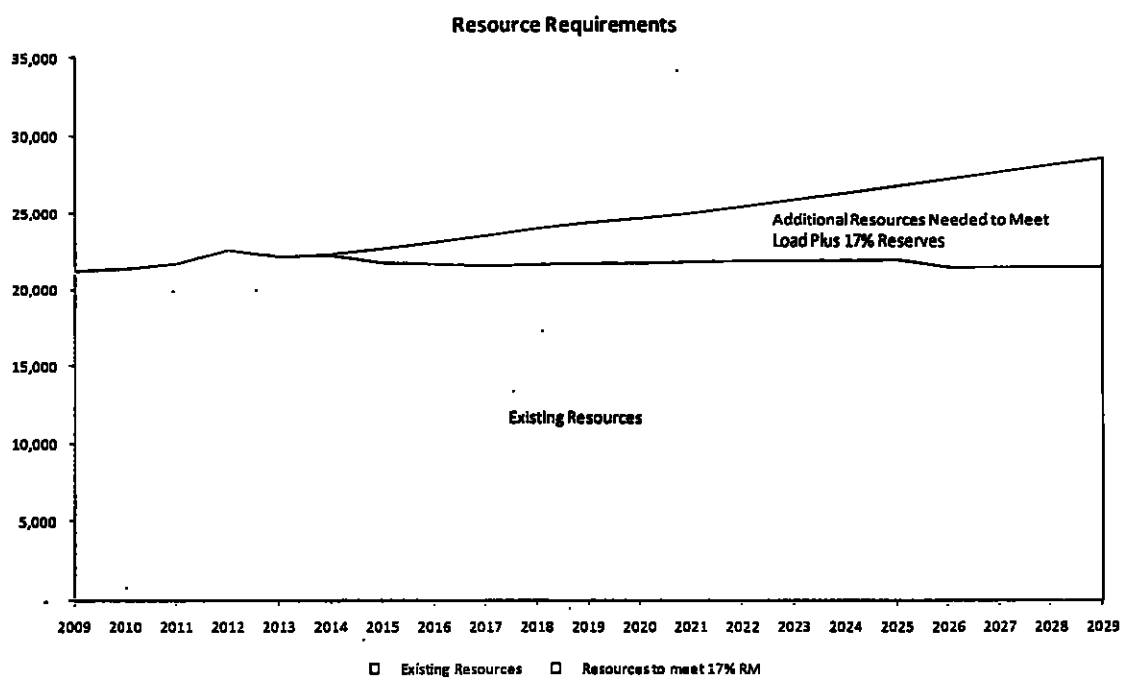
Q. WHAT ADDITIONAL SYSTEM RESOURCE NEEDS DID THE REVISED 2009 IRP IDENTIFY OVER THE PLANNING HORIZON?

A. Before the impact of energy efficiency programs are included, the current load forecast reflects a 1.8 percent average annual growth in summer peak demand, a 1.7 percent average annual growth in winter peaks, and a 1.8% increase in total energy usage. These percentages equate to an average annual growth rate of approximately 380 MW, and 2,000,000 megawatt-hours, of energy per year. In addition to this forecasted growth, we must consider that certain existing resources will no longer be available to meet our customers' needs over time. Each MW of capacity that is no longer available must be replaced with new capacity, either

from supply-side or demand-side resources. McMurry Graph 1 and McMurry Table 1 below show the existing resources and resource requirements to meet the load obligation, plus the 17 percent target planning reserve margin.

Beginning in 2009, existing resources, consisting of existing generation, DSM, and purchased power to meet load requirements, total 21,213 MW. The load obligation plus the target planning reserve margin is 20,462 MW, indicating sufficient resources to meet Duke Energy Carolinas' obligation through 2009. The need for additional capacity grows over time due to load growth, unit capacity adjustments, unit retirements, existing DSM program reductions, and expirations of purchased-power contracts. The need grows to approximately 3,280 MW by 2021 and to 7,150 MW by 2029.

McMurry Graph 1
Load/Resource Balance



McMurry Table 1
Cumulative Resource Additions to Meet a 17 % Planning Reserve Margin

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Resource Need	0	0	10	0	0	110	980	1450	1970	2330	2710

Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Resource Need	2980	3280	3610	4020	4440	4860	5820	6260	6710	7150

Q. WHAT ARE THE KEY ISSUES OR UNCERTAINTIES THAT WERE CONSIDERED IN THE REVISED 2009 IRP?

A. A few of the key uncertainties include, but are not limited to:

- Load Forecasts: How elastic is the demand for electricity? Will environmental regulations such as greenhouse gas legislation result in higher costs of electricity and, thus, lower electricity usage? Can a highly successful energy efficiency program actually flatten or even reduce demand growth? At what pace will recovery from the current economic conditions affect the demand for electricity?
- Nuclear Generation: Is the region ready for a nuclear revival? What is the timeframe needed to license and build nuclear plants? What level of certainty can be established with respect to the capital costs of a new nuclear power plant?
- Greenhouse Gas Regulation: What type of greenhouse gas legislation will be imposed? Will it be industry-specific or economy-wide? Will it be a "cap-and-trade" system? How will allowances be allocated? To what extent will carbon offsets be allowed?
- Renewable Energy: Will utilities be able to secure sufficient renewable resources to meet renewable portfolio standards? Will a federal standard be set? Will it have a "safety valve" price?

- Demand-Side Management ("DSM") and Energy Efficiency ("EE"): Can DSM and EE deliver the anticipated capacity and energy savings reliably? Are customers ready to embrace energy efficiency? Will an investment in Demand-Side Management and Energy Efficiency be treated equally with investments in a generating plant?
- Building Materials Availability and Cost: How long will the demand for building materials and equipment continue to be depressed and will there be significant price increases and lengthened delivery times? Is this an aberration or a long-term trend?
- Gas Prices: What is the future of natural gas prices and supply? Will enhanced natural gas recovery techniques open up new reserves in the United States?
- Coal Prices: What is the future of coal prices and supply? What impact will increased regulatory pressure on the coal mining industry have on availability and price?

Duke Energy Carolinas' resource planning process seeks to identify what actions the Company must take to ensure there is a safe, reliable, reasonably-priced supply of electricity regardless of how these uncertainties unfold. The comprehensive planning process considers a wide range of assumptions and uncertainties and develops an action plan that preserves the options necessary to meet customers' needs.

Q. ARE DECISIONS REGARDING RESOURCE PLANNING MADE ON THE BASIS OF QUANTITATIVE ANALYSES ALONE?

A. No. Consistent with the responsibility to meet customer energy needs in a reliable and economic manner, the Company's resource planning approach includes both quantitative analysis and qualitative considerations. Quantitative analysis provides insights on the potential impacts of future risks and uncertainties associated with fuel prices, load growth rates, capital and operating costs, and other variables. Qualitative perspectives such as the importance of fuel diversity, the Company's environmental profile, the stage of technology deployment, and regional economic development are also important factors to consider as long-term decisions are made regarding new resources.

Company management uses all of these perspectives and analyses to ensure that Duke Energy Carolinas will meet near-term and long-term customer needs, while maintaining flexibility to adjust to evolving economic, environmental, and operating circumstances in the future. The environment for planning the Company's system continues to be the most dynamic in Duke Energy Carolinas' 100-year-plus history. As a result, the Company believes prudent planning for customer needs requires a plan that is robust under many possible future scenarios. At the same time, it is important to maintain a number of options to respond to many potential outcomes of major planning uncertainties (e.g., federal greenhouse gas emission legislation).

Q. GIVEN THE ANALYSIS CONDUCTED WITH THESE CONSIDERATIONS IN MIND, WHAT WERE THE CONCLUSIONS OF THE REVISED 2009 IRP?

A. The results of the quantitative and qualitative analyses suggest that a combination of additional baseload, intermediate, and peaking generation, renewable resources, and EE and DSM programs are required over the next 20 years. The near-term

resource needs can be met with new EE and DSM programs, completing construction of the Buck, Dan River, and Cliffside Projects, as well as pursuing nuclear uprates and renewable resources.

In each IRP, the Company selects one portfolio as "the plan" to best meet customer needs. The portfolio chosen for the Revised 2009 IRP is made up of 4,464 MW of new natural gas simple cycle capacity, 2,234 MW of new nuclear capacity, 1,100 MW of Demand-Side Management, 483MW of Energy Efficiency, and 458 MW of renewable resources. The portfolio also included the Cliffside Unit 6 and Buck and Dan River Combined Cycle Projects.

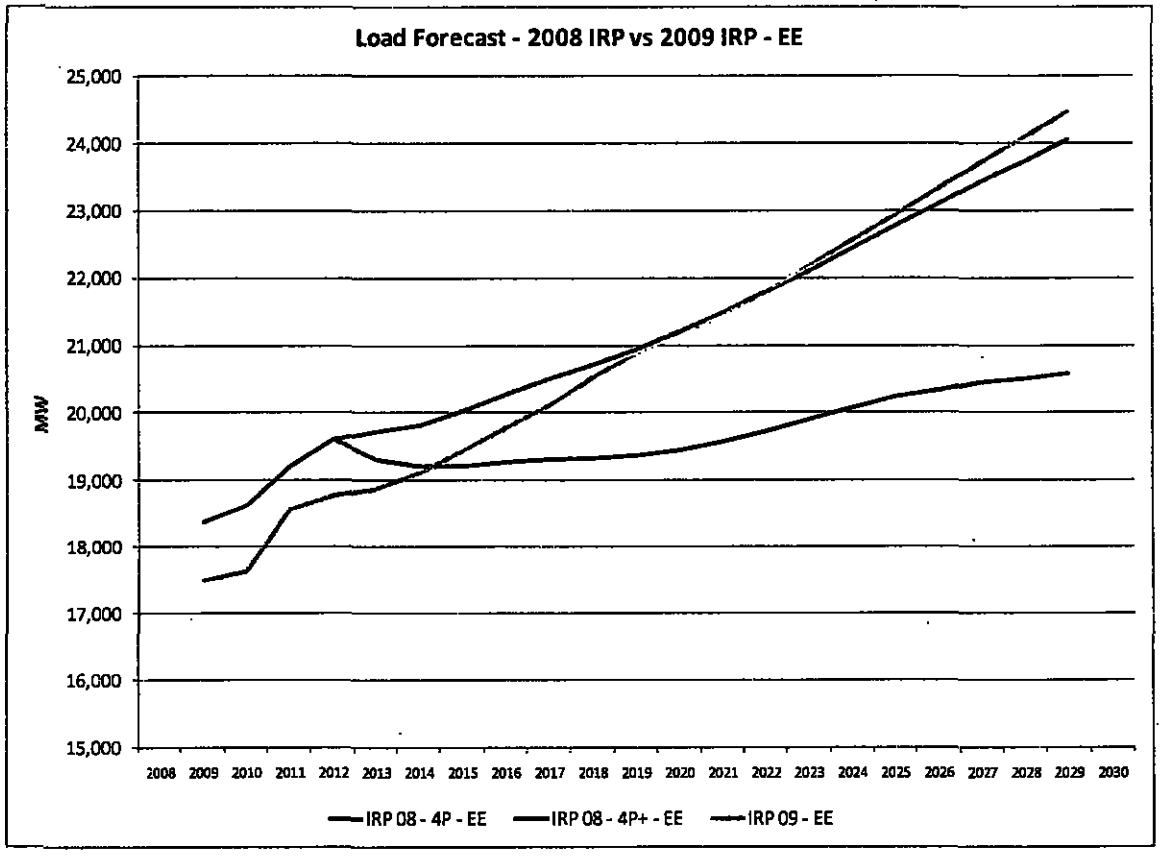
Q. WHAT ARE THE MAJOR CHANGES FROM THE 2008 IRP TO THE REVISED 2009 IRP?

A. Four major changes from the 2008 IRP to the Revised 2009 IRP involved the load forecast, energy efficiency, retirements and nuclear escalation rates. An explanation of each of these changes is described below.

- Load Forecast – Company Witness Riddle discusses the changes in the load forecast between the 2008 IRP and the Revised 2009 IRP. As noted by Mr. Riddle, the Company began to incorporate the expected impact of greenhouse gas ("GHG") regulation in the 2009 load forecast. However, my group created an estimate of the impact of GHG on the 2008 forecast in order to perform the Higher Carbon case analyses in the 2008 IRP. The 2008 Carbon Impact forecast was lower than the 2009 load forecast, which included the impact of GHG. The 2009 forecast is, I believe, a more accurate representation of the impact of GHG on customer loads. In particular, the 2008 forecast for the Higher Carbon cases

assumed no allocation of carbon allowances to utilities, resulting in higher costs to customers, and thus, reduced usage and a lower forecast. Also, the 2008 forecast likely "double counted" energy efficiency impacts by not recognizing that a response of customers to higher costs would be additional participation in the Company's energy efficiency programs. Other differences from the 2008 IRP include additional wholesale customers and some market penetration of plug in hybrid vehicles. An illustration of the 2008 and 2009 load forecast is shown in McMurry Graph 2 below.

McMurry Graph 2



- Energy Efficiency – Both the 2008 and the Revised 2009 IRPs included energy efficiency based on pursuit of the Company's energy efficiency plan as proposed

in Docket No. E-7, Sub 831. The 2009 load forecast with energy efficiency incorporated the impact on proposed programs of the settlement agreement ultimately approved in that docket. The agreement establishes goals increasing energy saving by approximately 50%, which were incorporated into the Revised 2009 IRP. (See further discussion below.) However, through measure and verification of the comparable programs in other jurisdictions, it was determined that the some of the benefits of the lighting program occurred later in the evening than when the peak load occurred, thereby reducing the contribution to peak load demand. Company Witness Stevie also discusses these results. Thus, the contribution to peak load reflected in the Revised 2009 IRP is lower than shown in the 2008 IRP (See McMurry Table 2 below).

McMurry Table 2

Reference	Contribution to Peak Load	Energy Impact
2008 IRP	1,800 MW	2,200 GW-hrs
2009 IRP	1,583 MW	3,800 GW-hrs

- Retirement Assumptions – The assumed retirement dates of the old fleet combustion turbines at Buck Steam Station, Dan River Steam Station, Riverbend Steam Station and Buzzard Roost Combustion Turbine Station were accelerated from 2014-2015 timeframe to June 2012 based on de-rates documented in 2009, availability of replacement parts, and the general condition of the units. Also, the remaining coal units without scrubbers at Buck Steam Station Units 5 & 6 and Lee Steam Station Units 1-3 were assumed to be retired in 2020, based on the continued increased regulatory scrutiny from an air, water and waste perspective.

This accounts for an additional 625 MW of generation that was assumed to be retired in the Revised 2009 IRP versus the 2008 IRP.

- Nuclear Project Escalation – The development period for the 2008 IRP was a high inflationary period for major construction projects. For this reason, the estimated nuclear project escalation rate used in the 2008 IRP was 6% through 2011 and 4% for the remainder of the project. However, the recessionary impacts in 2009 have reduced the forecasted inflationary impacts on major construction projects. As such, for the Revised 2009 IRP, the assumed project escalation rate for the entire project is 2.5%.

Q. SPECIFICALLY, WHAT DID THE REVISED 2009 IRP CONCLUDE AS TO NEED FOR AND TIMING OF NEW NUCLEAR GENERATION?

A. The Revised 2009 IRP strongly supports new nuclear generation as the best option to meet our customers' needs for future baseload generation under all scenarios analyzed; it is highly efficient and does not emit greenhouse gases. The Revised 2009 IRP findings favor both regional generation and a commercial operation date ("COD") for Lee Nuclear Station in the 2018 to 2021 time frame. This benefits our customers by providing time to (1) secure regional partnerships which allows costs to be spread between the partners (larger customer base), which keeps customer costs lower; and (2) seek cost recovery of project financing costs in North Carolina as they are incurred which lessens rate impact to customers. Our credit rating agencies view this as essential to moving forward with new nuclear, and it keeps our financing rates lower, which lowers total project costs.

Q. DID DUKE ENERGY CAROLINAS CONSIDER ENERGY EFFICIENCY AND DEMAND-SIDE RESOURCES IN THE REVISED 2009 IRP?

A. Yes. As discussed by Company Witness Stevie, projected load impacts for energy efficiency and demand-side resources were developed for the base case based on the terms of the settlement of the Application of Duke Energy Carolinas, LLC for Approval of Save-a-Watt Approach, Energy Efficiency Rider and Portfolio of Energy Efficiency Programs, Docket E-7, Sub 831, that was recently approved by the Commission. The conservation impacts were assumed at 85% of the target impacts from the terms of the proposed settlement. The projected load impacts from the conservation programs were based upon three bundles of the save-a-watt portfolio of programs. This was accomplished by allowing a new bundle to enter every four years. The projected load impacts from the DSM programs are based upon the continuing as well as the new demand response programs. This level of DSM/EE accomplishments was cost-effective in the screening stage of the analysis and thus was included in all portfolios.

In addition, a high case scenario was developed which uses the full target impacts of the save-a-watt bundle of programs for the first five years and then increases 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. This level of DSM/EE accomplishments was also cost-effective.

Q. DID DUKE ENERGY CAROLINAS CONSIDER RENEWABLE ENERGY RESOURCES?

A. Yes. As discussed by Company Witness Smith in his testimony, the Company filed its Renewable Energy and Energy Efficiency Portfolio Standard ("REPS")

Compliance Plan along with the 2009 IRP on September 1, 2009. REPS, and the related statutory and regulatory compliance planning requirements, resulted from the passage of Session Law 2007-397 ("Senate Bill 3"), which requires each of the State's electric public utilities to meet certain statutory percentages of its retail load through renewable energy and energy efficiency resources.

With the passage of Senate Bill 3, Duke Energy Carolinas modified its consideration of renewable energy resources. In previous IRPs, resources were screened on economics. Therefore, renewable resources were screened out as a result of their higher cost than traditional supply-side resources. In the Revised 2009 IRP, the level of renewable resources necessary for compliance with the REPS statute (N.C. Gen. Stat. § 62-133.8) and Commission rules in North Carolina was included in each portfolio. The assumptions for planning purposes are as follows:

Overall Requirements/Timing

- 3% of 2011 load by 2012
- 6% of 2014 load by 2015
- 10% of 2017 load by 2018

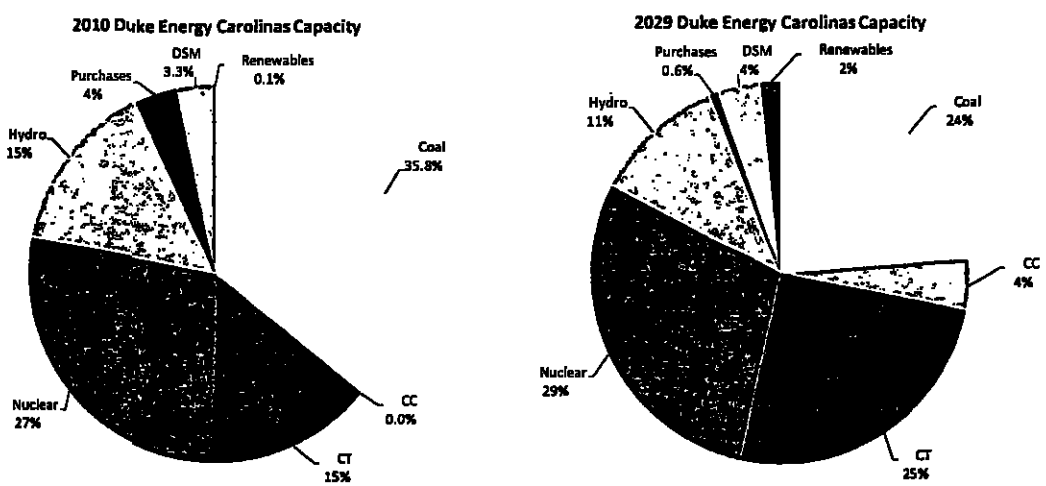
12.5% of 2020 load by 2021A portion of the REPS requirements also was assumed to be provided by EE, co-firing biomass in some of Duke Energy Carolinas' existing units, and by purchasing Renewable Energy Certificates from out of state, as permitted by the statute and Commission rules. The overall requirements were applied to all retail loads and legacy Schedule 10A customers served by Duke Energy Carolinas. The requirement that a certain percentage of generation must

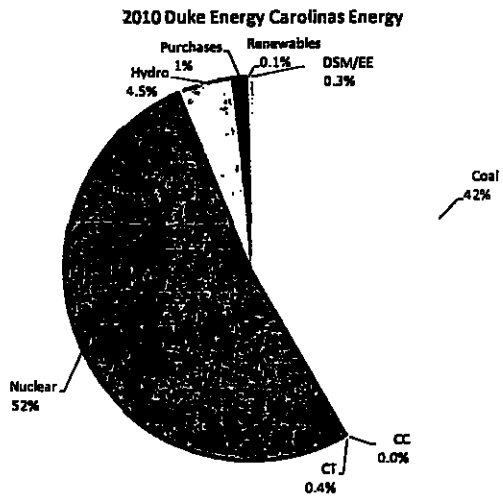
come from solar, swine waste and poultry waste resources was not applied to the South Carolina allocable portion. The Revised 2009 IRP includes 171 MW of on peak contribution from renewable energy by 2012 and approximately 458 MW by 2029.

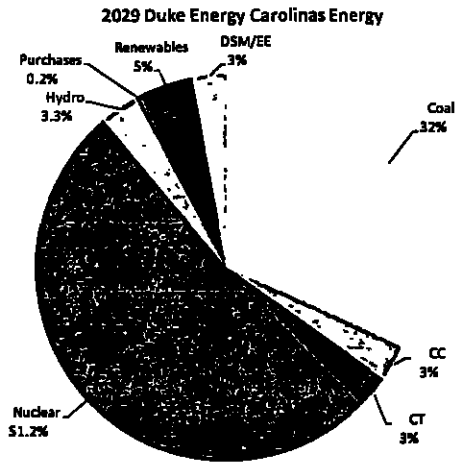
Q. PLEASE DESCRIBE DUKE ENERGY CAROLINAS' EXISTING GENERATION RESOURCE PORTFOLIO MIX.

A. Duke Energy Carolinas' generation portfolio is composed of over 21,000 MWs of generation capacity. As shown on the charts below in McMurry Graph 2, while Duke Energy Carolinas' capacity mix is roughly one-third coal, one-third nuclear, and one-third hydroelectric and gas-fired, the energy mix is roughly 50% nuclear and 40% coal-fired generation.

McMurry Graph 2







Q. HOW DOES BUILDING ADDITIONAL NUCLEAR GENERATION AFFECT THE DIVERSITY OF THE PORTFOLIO?

A. As noted above, Duke Energy Carolinas is planning on adding significant amounts of renewable and DSM/EE resources. Even with these efforts which would add significant levels of additional DSM/EE and renewable energy, as well as the addition of the 825 MW new advanced clean coal Cliffside unit, significant generation resources are needed to meet customer demands. If additional nuclear or coal capacity is not added, the only feasible generation alternative is natural gas-fired generation and continued operation of older, less efficient coal-fired generation. The addition of the Lee Nuclear Station will mean less dependence on natural gas or coal-fired generation. The continued development of Lee Nuclear would allow for continued diversification of resources, which is a benefit to all customers.

Q. HOW DO THE CONCLUSIONS FROM THE REVISED 2009 IRP COMPARE TO THOSE OF THE 2008 IRP?

A. The Revised 2009 IRP still supports the need for the Cliffside Unit 6 and the new Combined Cycle units at Buck and Dan River prior to 2015. However, the impact of the recession on load demand has (1) impacted the need to phase-in the Buck Combined Cycle unit so that the Combustion Turbine portion will not be operable during the summer of 2011; and (2) delayed the need for the Dan River Combined cycle until the summer of 2013. Additionally, the Revised 2009 IRP, as well as the 2008 IRP, strongly supports the need for the Lee Nuclear Station as a critical part of Duke Energy Carolinas' resource mix. In sum, with the inclusion of the updated information for the Revised 2009 IRP, the basic conclusions of the 2008 IRP remain unchanged.

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes, it does.

CERTIFICATE OF SERVICE

I certify that a copy of Duke Energy Carolinas, LLC's Direct Testimony of Witnesses Richard G. Stevie, Ph.D.; Owen A. Smith; Robert A. McMurry and James A. Riddle and the revised IRP in Docket Nos. E-100, Sub 118 and 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 11th day of January, 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