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May 23 2014

May 23, 2014

VIA ELECTRONIC FILING

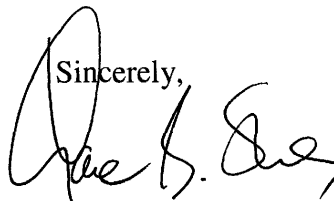
Gail L. Mount
Chief Clerk
North Carolina Utilities Commission
4325 Mail Service Center
Raleigh, North Carolina 27699-4325

**RE: 2013 Biennial Integrated Resource Plans and Related 2013 REPS
Compliance Plans
Docket No. E-100, Sub 137**

Dear Ms. Mount:

I enclose Duke Energy Carolinas, LLC ("DEC") and Duke Energy Progress, Inc.'s Reply Comments for filing in connection with the referenced matter. As noted in the Reply Comments, also enclosed is DEC's Appendix L: Carbon Neutrality Plan for filing as a supplement to the DEC 2013 IRP Update.

Thank you for your attention to this matter. If you have any questions, please let me know.

Sincerely,

Lawrence B. Somers

Enclosures

cc: Parties of Record

**STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH**

DOCKET NO. E-100, SUB 137

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of 2013 Biennial Integrated Resource Plans and Related 2013 REPS Compliance Plans))))	DUKE ENERGY CAROLINAS AND DUKE ENERGY PROGRESS' REPLY COMMENTS
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Pursuant to North Carolina Utilities Commission ("the Commission") Rule R8-60(j) and the Commission's April 17, 2014 *Order Granting Extension of Time to File Reply Comments*, Duke Energy Carolinas, LLC ("DEC") and Duke Energy Progress, Inc. ("DEP") (and collectively "the Companies"), hereby submit their Reply Comments to the Comments of the Public Staff; the North Carolina Waste Awareness and Reduction Network, Inc. ("NC WARN"); the North Carolina Sustainable Energy Association ("NCSEA"); the Southern Alliance for Clean Energy ("SACE") and the Sierra Club ("Sierra Club"); and Mid-Atlantic Renewable Energy Coalition ("MAREC"), in the above referenced docket. In support thereof, DEC and DEP show as follows:

INTRODUCTION

Commission Rule R8-60 requires all North Carolina electric suppliers to file comprehensive biennial Integrated Resource Plans ("IRPs") with the Commission on September 1 of each evenly-numbered year, with updates to the biennial IRPs on September 1 of each odd-numbered year. All North Carolina electric suppliers last filed their comprehensive biennial IRPs in September of 2012. DEC and DEP filed their 2013

IRP Updates on October 15, 2013. The Commission approved DEC and DEP's 2012 biennial IRPs in its October 14, 2013 Order. The 2013 IRP Updates benefitted from the combined experience of both utilities' subject matter experts by utilizing best practices from each utility in the development of their respective IRP inputs and use of analytical planning models.

The allegations asserted by many intervenors regarding DEC and DEP's 2013 IRP Updates are very similar to those considered and dismissed by the Commission in recent past IRP proceedings. In essence, those allegations are: DEC and DEP's IRPs should include greater reliance upon demand-side management and energy efficiency ("DSM and EE") programs and measures and renewable energy resources, with less reliance on reliable and cost-effective baseload nuclear, gas and coal resources. In its April 11, 2014 Comments, the Public Staff was generally supportive of the Companies' IRP Updates and REPS compliance plans. Some specific findings by the Public Staff include:

- DEC and DEP used accepted econometric and end-use analytical models to forecast peak and energy needs and that the Companies' peak load and energy sales forecasts are reasonable for planning purposes (Public Staff Comments at p. 12-16);
- DEC and DEP's reserve margins are adequate (*Id.* at p. 32);
- DEC and DEP should be able to meet their REPS obligations, with the exception of the swine and poultry waste set-asides, during the planning period without nearing or exceeding their cost caps. (*Id.* at p. 86).

The Companies respectfully submit that their 2013 IRP Updates and REPS compliance plans meet all applicable statutory and Commission requirements and should be approved. The following comments reply to specific initial comments of various intervenors¹.

REPLY TO INTERVENOR COMMENTS

I. Reply to Public Staff Comments

As noted above, the Public Staff generally found DEC and DEP's IRP Updates to be reasonable for planning purposes and recommended that the Commission approve them. The Public Staff asked that the Companies address the following issues in these reply comments.

A. DEC should file a Carbon Neutrality Plan with its reply comments and continue to provide updates in future IRPs regarding its obligations related to the Cliffside Unit 6 permit.

As the Public Staff noted, the Commission's order approving the 2012 DEC IRP contained a requirement that DEC continue to provide updates in future IRPs regarding its obligations related to the Cliffside 6 air permit, and was issued on October 14, 2013. The 2013 DEC IRP update had already been prepared and was filed on October 15, 2013, without the Cliffside Unit 6 Carbon Neutrality Plan. Accordingly, DEC attaches the Carbon Neutrality Plan as a supplemental Appendix L to its 2013 IRP Update.

B. DEC and DEP in their reply comments and future IRPs should provide both information on the number and resource type of the facilities currently within the respective utility's interconnection queue and a discussion of how the potential QF purchases would affect the utility's long-range energy and capacity needs.

¹ DEC and DEP will not respond to all allegations raised in the parties' voluminous initial comments in these reply comments, as many of these allegations have been raised and rejected in previous IRP proceedings. The Companies' lack of reply to a specific comment by another party should not be construed as an acceptance of their argument.

If requested by the Commission in the Order on this IRP, the Companies will include the requested information on the interconnection queue in future IRP filings. As of April 30, 2014, DEC and DEP have the following potential projects in their interconnection queue:

“In Queue” Qualified Facilities – as of April 30, 2014				
OPCO	Facility State	Energy Source Type	Number of Customers	Total Capacity (MW AC)
DEC	NC	Biomass	3	8.70
		Hydro	3	31.51
		Solar	132	754.92
	NC Total		138	795.13
	SC	Hydro	1	0.25
	SC Total		1	0.25
DEC Total			139	795.38
DEP	NC	Biomass	4	8.45
		Hydro	2	1.55
		Landfill Gas	3	17.75
		Solar	243	2297.07
	NC Total		252	2324.81
	SC	Biomass	1	73.00
		Solar	4	142.31
	SC Total		5	215.31
DEP Total			257	2540.12
Grand Total			396	3335.49

With regard to the potential impact of the projects in the interconnection queue on the Companies' resource plans, it is the Companies' position that each Company's REPS Compliance Plans, as included in the 2013 IRP Updates, are the best estimate of renewables adoption at this point in time. The plans reflect careful examination of the current interconnection queue and estimation of how much renewable capacity could be cost effectively converted to compliance resources. Based on this review, the Companies' 2013 IRP Updates only utilized existing executed renewable contracts along with enough future renewable resources required to meet mandatory renewable targets under NCREPS, as well as a proxy for a future renewable energy standard for South Carolina beginning in 2018. Additional renewable resources are possible, but subjective, and as such are not appropriate for inclusion in the Companies' base resource plans. For planning purposes, DEC and DEP must ensure that they can meet peak load demand without relying upon on speculative unexecuted non-utility resources. Given DEC and DEP's experience with renewable projects proposed by developers, the utility cannot depend on potential projects that are in excess of its targets set in the above planning assumptions. As explained in the late filed exhibit in the recent avoided cost proceeding (Docket No. E-100 Sub 136), historically DEC and DEP have seen approximately twenty-five (25%) of the capacity in the interconnection queue come to fruition. When viewed in the aggregate between DEC and DEP, this completion rate applied to the current interconnection queue would not exceed the REPs compliance plan for the IRP planning horizon. Additionally, as discussed *infra*, alternative scenarios considered in the IRP evaluate the potential impact of renewable resources at levels higher than needed for compliance.

C. Additional Public Staff Comments

Following are additional reply comments to other issues discussed by the Public Staff in its comments.

Load Forecasts

The Public Staff concluded that both DEC and DEP's load forecasts and methodologies were reasonable for planning purposes. The Public Staff nonetheless commented that DEC's forecasts for both peak demand and energy sales have been higher than actual loads since 2008 and recommended that DEC review and incorporate the best forecasting practices of DEP and DEC. (Public Staff Comments at p. 15-16). DEC agrees that the DEC Forecast developed in 2008 was too high; however, it is important to note that most of the forecast error was due to the severe economic downturn that occurred in 2009 and which no one reasonably foresaw. In 2009, instead of experiencing load growth, the DEC peak dropped over 500 MW due to the considerable loss of industrial load. DEC suffered more than DEP and most utilities in the 2009 recession due to its large amount of industrial load, particularly from textiles. Since 2009, the DEC weather adjusted peak has grown an average of 1.1% despite a very sluggish economic recovery. Also, the DEC peak forecast developed in 2010 projected a 2013 value that was only 131 MW different than the actual weather adjusted value for the year 2013. Thus, DEC acknowledges the anomaly in the load forecast caused by the severe economic downturn, but believes the 2013 load forecast is reasonable. However, the Companies note that their forecasting methodology is always evolving in an effort to further improve the process, as a result of post-merger best practices and otherwise.

Changes to IRP process

The Public Staff Comments include discussion and inquiry regarding potential modifications to the IRP process and filing calendar that may be reasonable. The Companies' observation is that IRP process has expanded in scope over time through incremental annual IRP rulings, along with a growing number of special interest group intervenors participating in the IRP process. This is not surprising because the IRP essentially incorporates many facets of the utility business including energy efficiency, renewables compliance, fuel forecasts, new plant development, environmental compliance strategies, load forecasting, etc. Most of these intervenors focus only on issues of importance to their members or stakeholders, but lack the obligation for the provision of reliable power delivery and the obligation for least cost planning on behalf of all Duke Energy Carolinas' and Duke Energy Progress' customers that the IRP planning process requires. To a large extent many of the individual issues now being raised by intervenors within the context of an IRP docket have their own focused regulatory proceedings. For example, the IRP clearly has overlap with EE, REPS, fuel, CPCN, avoided cost and rate case proceedings. However, the IRP was never intended to supplant or supersede these more focused proceedings. Rather, the IRP process by its very nature is a planning process only that provides insights into factors that influence the utilities' future resource plans. To a large extent several of the recommendations expressed by intervenors in their IRP comments are the same recommendations made within the context of the more focused proceedings. To some degree, this moves the IRP process away from a big picture, long term planning process toward more of a shorter term operational focus. Should the Commission wish to consider refocusing the IRP to

its original intent by moving to a bi-annual process or some other variation of an IRP process modification the Company would be supportive of working toward productive revisions to the process.

Environmental Analysis

The companies' IRPs include resource plans that comply with all known federal and state level environmental laws. Fixed and variable environmental compliance costs required for regulatory compliance are included and appropriately considered in the IRP planning process. The IRPs not only include the quantitative aspects of environmental compliance, but also include an extensive qualitative discussion surrounding existing and pending environmental regulations. Given the extent to which the Companies already consider environmental compliance in the IRP process, DEC and DEP do not believe that additional prescription concerning specific methods by which to incorporate environmental compliance costs are warranted.

Decommissioning Costs

Decommissioning costs for existing coal, nuclear and gas units do not have a direct influence on the Companies' future expansion plans. Ultimately, these costs are sunk costs associated with exiting unit retirements and do not influence the selection of the future resource portfolio. Costs associated with the retirement of existing generating units that have been in service for many decades have existing mechanisms in place for review and cost recovery. Requiring the IRP process to address decommissioning costs of existing units will not alter the resource planning process, nor the selected expansion plan. While a consideration of decommissioning costs may have merit in appropriate

dockets or proceedings, DEC and DEP assert that the IRP process is not the appropriate place to address this issue.

Quantifying Generation Diversity Benefits

The Public Staff recommends that the Companies develop a quantification method for fuel diversity as part of the IRP process. The Companies believe that recommendation is already captured as part of the existing IRP process commensurate with Commission Rule R8-60. The Companies' current IRP practices include modeling multiple sensitivities around fuel prices. Furthermore, the Companies show how different resource portfolios perform under these varying fuel prices. Both the quantitative impacts and the qualitative benefits of fuel diversity are fully presented in the IRPs. The Public Staff does not provide a specific recommendation as to what other quantitative metric or method they are recommending and as such it is difficult to ascertain the merits of such additional analysis. The Companies believe that the current approach that both quantitatively and qualitatively addresses fuel diversity is fully adequate.

II. Reply to NC WARN Comments

In its comments², NC WARN rehashes its previous IRP contentions and yet again makes the completely false assertion that DEC and DEP's IRP Updates are based upon exaggerated load forecasts. In its comments, NC WARN advances unsupported hyperbole that the resource plans filed by DEC and DEP would "bankrupt North Carolina's economy," simply because the Companies rely upon a mix of resources that

² NC WARN's Comments and Request for Evidentiary Hearing, dated April 11, 2014. ("NC WARN Comments").

include reliable and cost-effective baseload nuclear, gas and coal generation. (NC WARN Comments at p. 3). Without apparent regard to cost, reliability or feasibility, NC WARN instead proposes that its allegedly superior alternate energy future can be achieved by “eliminating all coal plants and all new generation.” (NC WARN Comments at p. 1). As in past IRP dockets, the Commission should dismiss this group’s meritless contentions.

A. NC WARN’s Criticism of “Differing” Load Forecasts is Entirely Misplaced.

Once again, NC WARN asserts a completely baseless allegation regarding the validity of DEC and DEP’s load forecasts. NC WARN alleges in its comments that the load forecasts contained in the 2013 DEC and DEP IRP Updates are higher than various general load growth comments attributed to Duke Energy Corporation CEO Lynn Good, Duke Energy State President- North Carolina Paul Newton, and former Duke Energy Corporation CEO Jim Rogers in various public or media comments from November 2013, January 2014, and December 2013, respectively. (NC WARN Comments at p. 5-6). NC WARN insinuates that Duke Energy filed one set of load forecasts with this Commission, yet told other audiences that the true load forecast is much lower. It is disturbing that NC WARN apparently fails to understand (or willfully ignores) that Duke Energy operates utilities in six (6) states, *and that the referenced Duke Energy executives were not speaking about the DEC and DEP 2013 load forecasts in their comments.* The load forecasts for DEC and DEP in North Carolina and South Carolina are different than the outlook for the Duke Energy utilities in Indiana, Ohio, Kentucky or Florida; are different than the outlook for the aggregated Duke Energy utilities (referred to by Duke

Energy as Franchised Electric & Gas); and are different than the reported outlook for the United States electric industry in general - - which were the subject of the various comments by the Duke Energy executives. Comparison among different utilities or data from national organizations such as EIA is complicated due to different terminology, different forecast horizons or different load definitions, and NC WARN's comments at best fail to attempt a true "apples-to-apples" comparison. Simply put, the facts are that DEC and DEP's load are projected to grow at a faster pace than the Duke Energy Franchised Electric & Gas load or the U.S. electric industry load, due to the higher population growth rate and growing wholesale load contribution in North Carolina and South Carolina. Furthermore, former CEO Rogers often spoke in terms of the U.S. electric industry as a whole and often discussed negative load growth in terms of national use-per-customer trends, not total sales and certainly not as to DEC and DEP load forecasts. DEC and DEP's projected growth in number of customers (driven by population growth or migration of population from other parts of the country) more than offsets any decline in per-customer usage growth. In order for DEC or DEP to have "zero growth" as NC WARN asserts, *average electric use per customer would have to decline by negative one percent (- 1.0%) or more each and every year over the planning horizon of 2028*. NC WARN did not prepare a true load forecast, but simply assumed "zero growth." Such an assumption is entirely inconsistent with the actual data utilized to prepare the load forecasts for the Companies' 2013 IRP Updates. DEC and DEP stand by the reasonableness of the load forecasts contained in their 2013 IRP Updates, and which have been reviewed and supported by the Public Staff.

B. NC WARN's "Model" and Zero Growth Scenario are Unrealistic.

In its comments, NC WARN touts its own proposed resource plan as superior to those contained in DEC and DEP's 2013 IRP Updates and states that its "*analysis* shows that a zero growth scenario allows for phase out of all coal plants, eliminates the need to construct new nuclear plants and reduces the need for some existing natural gas." (NC WARN Comments at p. 9, emphasis added). In a familiar pattern, however, when information is sought about the support for NC WARN's allegations, no substantive analysis is forthcoming. In response to a data request seeking the details of NC WARN's proposed coal retirement and replacement plan, NC WARN responded, "As such NC WARN has not analyzed the proposed retirement dates and unit capacity of the coal plants, nor has it analyzed the specific replacement needs."³ In response to a data request seeking a copy of NC WARN's "plan" and "model," and the specific inputs used in the production cost simulation models and screening models supporting the NC WARN comments, NC WARN responded,

NC WARN's "plan" (used interchangeably with "model") is described in the comments, paragraphs 25-29, and is based on the charts in Appendix A and the NC WARN's report filed in last year's initial Comments on the IRPs. . . . NC WARN has not prepared production cost simulation models and screening models of the NC WARN plan or model, nor developed any of the inputs listed in the request, except recently looked at natural gas price forecasts as part of the preparation of the [NC WARN avoided cost testimony filed in E-100, Sub 140].⁴

According to NC WARN's data request responses, the pie charts contained in Appendix A to NC WARN's report were prepared by NC WARN's legal counsel and

³ NC WARN Response to Duke Energy Data Request 3, May 1, 2014.

⁴ NC WARN Response to Duke Energy Data Request 10, May 1, 2014.

researcher/paralegal.⁵ In response to a data request seeking the detailed data assumptions utilized to determine the economic value of the analysis reflected in the NC WARN Comments, NC WARN responded, “NC WARN has not conducted PVRR calculations, nor made assumptions associated with those calculations.”⁶ In its comments, NC WARN also alleges that, “If the Commission approves the Duke Energy plan, it approves a status quo threatening to bankrupt North Carolina’s economy . . . ” (NC WARN Comments at p. 3). In response to a data request asking for all workpapers, studies or other documents that were relied upon in forming this statement, NC WARN responded that it did not have any such workpapers or studies, but that its statement is explained in its comments “that the difference between a 1.5% load growth as asserted in Duke Energy’s IRP and a 0% load growth as projected in NC WARN’s analysis represents \$25 billion in new plants that would be charged to new ratepayers . . . Therefore, it is inevitable that \$25 billion in capital expenditures on the part of the utility that is then paid for by ratepayers will be detrimental to North Carolina’s economy.”⁷ As such, NC WARN has no credible support for its absurd allegation that approval of the proposed resource plans contained in the 2013 DEC and DEP IRP Updates threaten to bankrupt North Carolina’s economy.

In support of the NC WARN “model,” which asserts that there will be 0% load growth over the 2014-2028 time period covered by the DEC and DEP IRP Updates, NC WARN alleges that DEC and DEP can retire all existing coal units and some existing natural gas units, and meet all energy and capacity needs exclusively through reliance upon a mix of new EE, renewable energy, and distributed generation, backed up by

⁵ NC WARN Response to Duke Energy Data Request 9, May 1, 2014.

⁶ NC WARN Response to Duke Energy Data Request 21, May 1, 2014.

⁷ NC WARN Response to Duke Energy Data Request 1, May 1, 2014.

batteries and pumped storage. (NC WARN Comments at p. 9). Although NC WARN acknowledges the least cost IRP standard articulated in N.C. Gen. Stat. §62-2, it relies upon no legitimate economic analysis to support its proposed resource plan because, as its data request responses reveal, it has none. In response to a data request seeking the detailed cost information supporting the renewable energy resources reflected in NC WARN's comments, NC WARN replied, "NC WARN has not documented the capital costs, on-going capital streams, fixed and variable O&M costs, life of asset, assumptions of federal/state tax incentives, load profiles, and capacity factors as part of the present Comments beyond the statements and footnotes in the comments."⁸ In response to a data request seeking the EE and demand response costs, program participation and participation studies used to support the NC WARN comments, NC WARN responded, "NC WARN has not prepared energy efficiency and demand response costs, program participation, and participation studies beyond NC WARN's proposal for a Community Enhanced Income Qualified Energy Efficiency and Weatherization Program [as contained in NC WARN's testimony in Docket No. E-7, Sub 1032]."⁹ In response to a data request seeking support for NC WARN's statement that its "approach can provide an estimated annual savings to North Carolina electricity customers of more than \$2 billion," (NC WARN Comments at p. 21), NC WARN responded that its statement was based "primarily for out-of-state sources of coal and natural gas. At least \$1.7 billion of this is for coal. . . . The remainder is a rough estimate of natural gas costs to yield an approximate number."¹⁰ NC WARN has conducted no revenue requirements analysis for

⁸ NC WARN Response to Duke Energy Data Request 17, May 1, 2014.

⁹ NC WARN Response to Duke Energy Data Request 18, May 1, 2014.

¹⁰ NC WARN Response to Duke Energy Data Request 22, May 1, 2014.

its proposed resource portfolio, which is based primarily on higher cost, intermittent renewable resources and EE, and therefore has no legitimate basis to assert that its proposal is cost effective for North Carolina customers of DEC and DEP.

NC WARN's "plan" was also apparently "developed" without regard to system reliability concerns. NC WARN's reliance upon increased renewables in its comments was also based upon errors revealed by DEC and DEP's data requests. On page 17 of its comments, NC WARN stated that a "renewable energy build-up" should "account for 24% of total electricity sales." In response to a data request seeking all support for what type of renewable energy would be available and reliable to meet the DEC and DEP system demands during the planning horizon, NC WARN responded in pertinent part as follows:

In responding to this request, NC WARN notes an error in its Comments. The renewable energy build-up accounts for 7% of sales as described in Appendix A with energy efficiency account [sic] for 24% of sales. This will be corrected. . . .¹¹

Furthermore, NC WARN's data request responses reveal that it conducted no loss of load study¹² and when asked to explain in detail how its proposed "plan" will provide adequate reliability for the DEC and DEP systems and their customers, NC WARN responded simply as follows:

As stated in the Comments, page 4 and footnote 1, the inclusion of a balanced mix of distributed generation and energy efficiency is more reliable than the current generation – transmission – distribution system, and especially if backed up by batteries. Electricity is placed where it is most needed both on the grid and at peak periods, and at the same time, distributed generation provides grid support services. As noted in the Comments, paragraph 15, a wide variety of these sources do not require as high a reserve margin as does a system relying on a limited number of

¹¹ NC WARN Response to Duke Energy Data Request 6, May 1, 2014.

¹² NC WARN Response to Duke Energy Data Request 12, May 1, 2014.

large coal and nuclear plants. NC WARN recently except [sic] recently looked at the value of solar, including reliability, as part of the preparation of [testimony filed by NC WARN in Docket No. E-100, Sub 140].¹³

Accordingly, NC WARN's responses to the Companies' data requests indicate significant concern with the "analysis" presented therein and which serves as the basis for NC WARN's comments. The Companies submit that the NC WARN plan is not a realistic proposal if the State of North Carolina wants to ensure reliable and affordable electricity are available to the residential, commercial and industrial customers over the IRP planning horizon, as the Companies are obligated to do. Renewable resources, EE and DSM are important and increasingly significant components of DEC and DEP's IRPs, but they simply cannot realistically be relied upon in the almost exclusive nature that NC WARN has alleged. In contrast to the NC WARN "plan", the Companies' IRPs present robust and balanced portfolios of diverse supply and demand side resources that will cost-effectively and reliably serve customers' short and long-term needs across a range of many possible future scenarios. Accordingly, the comments of NC WARN should be disregarded and their request for an evidentiary hearing should be denied.

III. Reply to NCSEA Comments

In its IRP comments, NCSEA does not appear to have any real criticism of the DEC and DEP IRP Updates, and instead finds the Companies' increased diversification into renewable energy resources, including DSM/EE, to be "promising." (NCSEA Comments at p. 11, 15). NCSEA makes some unique policy suggestions, such as asking the Commission to "reaffirm the foundational importance" of the IRP proceeding, to which the Companies will not reply. NCSEA asks the Commission to endorse

¹³ NC WARN Response to Duke Energy Data Request 11, May 1, 2014.

consistency across proceedings, and discusses assumptions used in the IRP and avoided cost proceedings. (NCSEA Comments at p. 17). DEC and DEP strive for consistency in the underlying assumptions and methodologies used in their various proceedings, and have noted their post-merger emphasis on developing consistency and best practices where applicable. As an example, the avoided energy and avoided capacity values used in DEC and DEP's EE/DSM rider proceedings are taken directly from the IRP. NCSEA also asks that the utilities concisely state in one place in their IRPs "all of the key policy assumptions" which underlie its base case or recommended plan. DEC and DEP assert that their IRPs do explain the policy assumptions contained therein.¹⁴

NCSEA also commented on DEC and DEP's "aspirational" ¹⁵ EE savings performance targets as contained in a settlement agreement filed with the Public Service Commission of South Carolina, and asks the Commission to push the Companies to innovate to meet their aspirational goal by encouraging collaborative efforts to develop new EE programs and measures, such as combined heat and power ("CHP"). (NCSEA Comments at p. 15). The Companies note that related issues were already agreed to as part of the Stipulation and Agreement filed in Docket No. E-7, Sub 1032 and agreed to in Docket No. E-2, Sub 1030, and in fact a Duke Energy Collaborative meeting where CHP was discussed has already been held. Finally, NCSEA also raises a pet issue unrelated to the IRPs - - facilitating third party access to private customer usage data. NCSEA asks that the Commission require utilities to provide online forms for customers to authorize

¹⁴ The Companies also note that NCSEA employs a team of attorneys, lobbyists, policy analysts and consultants who are capable of reading the IRPs and that NCSEA has historically not been adverse to utilizing the discovery process available to it.

¹⁵ NCSEA quotes the Merriam-Webster definition of "aspire" in footnote 10 to its comments on page 15. *But cf.*, NCSEA's use of "aspirational" in paragraph 1(c) of its May 12, 2014 Motion for Extension of Time filed in Docket No. E-100, Sub 101.

disclosure of their usage information to third parties. Perhaps NCSEA is not aware, but DEC and DEP do have an online “Energy Data Request Form,” for independent third parties with a need to use customer data. This website allows third parties to identify themselves and provide details about the specific data they seek. After completing the online form, such third parties are contacted electronically by Duke Energy with information about the process and requirements, including the cost of data, and are provided an electronic copy of the Duke Energy customer data release form. This process was developed with the Companies’ Code of Conduct in mind and to ensure a consistent and cost-effective approach for handling third party requests. DEC and DEP assert that the current process works well.

As to the Companies’ REPS Compliance Plans, NCSEA asks that the Companies be required to submit one-sentence certifications that prior REPS compliance plan reviews have been conducted, unless this is obvious from the filing of a revised past REPS compliance plan with redactions removed. DEC and DEP would not object to such a Commission requirement.

NCSEA also requests that the Commission require the utilities to create avoided cost projections in their 2014 REPS compliance plans using the methodological approaches approved in the 2012 avoided cost order, together with a statement from DEC and DEP indicating whether the effect of the JDA was incorporated. First, the Commission’s February 21, 2014 *Order Establishing Standard Rates and Contract Terms for Qualifying Facilities* in Docket No. E-100, Sub 136 discussed the use of avoided costs in REPS Compliance Plans and held in Finding No. 18 that, “DEC and

DEP henceforth should include actual projected avoided cost rates as of the date of the compliance filings.” Second, the Commission’s rules already require the utilities to include the current and projected avoided cost rates for the years of the subject plan, so NCSEA’s recommendation is all the more duplicative and unnecessary. See Rule R8-67(b)(1)(v). Third, DEC and DEP’s position is that avoided cost calculations are subject to their own regulatory proceedings in which stakeholders have opportunity for substantial input. In fact, NCSEA is a party to the currently pending Docket No. E-100, Sub 140 proceeding, wherein the Commission is examining the methodological approaches utilized in the 2012 avoided cost proceeding for the 2014 avoided cost proceeding. Filing avoided cost projections in the REPS Compliance Plans on September 1, 2014, based on 2012 methodologies that are currently under review could result in outdated and inaccurate projections.

IV. Reply to MAREC Comments

As in its 2012 IRP comments, MAREC, a non-profit formed to advance renewable energy development primarily in the PJM Interconnection markets, again makes the general allegation in its comments that DEC and DEP did not adequately consider wind energy in their IRPs. MAREC notes that DEC and DEP should not have been expected to comply with the Commission’s requirement to consider additional resource scenarios that include larger amounts of renewable energy resources similar to DNCP’s Renewable Plan, because that requirement was included in the Commission order approving the 2012 IRPs and issued the day prior to the filing of the DEC and DEP 2013 IRP Updates. DEC’s 2013 IRP Update base case includes 849 MW of renewable resources by 2018 and 2,028 MW by 2028, which includes 150 MW of wind. DEP’s

2013 IRP Update base case includes 297 MW of renewable resources by 2018 and 802 MW by 2028, which includes 100 MW of wind. MAREC does not appear to appreciate, however, that both Companies' 2013 IRP Updates also included an Environmental Focus Scenario ("EFS"), which evaluated an assumed requirement to serve approximately 8% of each Company's combined retail load with new renewable resources by 2028 - - which represents approximately twice the amount of renewable energy as compared to the base case. The DEC EFS included 758 MW of nameplate wind and the DEP EFS included 505 MW of nameplate wind. The purpose of the scenario is to show how the Companies' resource plans would be affected in the event that additional cost-effective renewable and energy efficiency resources are identified or mandated. A key takeaway is that, in such an event, some traditional resources can be eliminated or deferred but significant levels of traditional resources such as new nuclear and natural-gas combined cycle are still needed.

DEC and DEP adequately considered wind and all other potential renewable energy resources in preparing their 2013 IRP Updates. Duke Energy Corporation, the parent company of DEC and DEP, is one of the largest wind energy developers in the United States and recognizes the valuable potential that new wind energy resource development can provide. In their IRPs, however, DEC and DEP analyzed wind and other generation technologies and selected the resource plans that best met the Companies' needs to provide the reliable, least-cost resource mix as required by North Carolina's integrated resource planning and REPS laws.

MAREC also contends that the Companies should include a new annual RFP process that would solicit new renewables. Both DEC and DEP regularly assess the market place for competitive wind and other renewable resources, including through formal RFPs or the receipt of unsolicited bids. On February 14, 2014, DEP and DEC issued a RFP for 300 MW of new solar energy capacity to allow DEP and DEC to further their commitments to renewable energy, diversify their energy mix and meet their REPS requirements. Accordingly, MAREC's proposed RFP requirement is unnecessary.

V. Reply to SACE and Sierra Club Comments

In their comments, SACE and Sierra Club generally critique the Companies' inclusion of EE and renewable resources, and without offering their own proposed mix of least cost and reliable resources, assert that the resource plans contained in the Companies' IRP Update are inadequate. As set forth in detail below, DEC and DEP stand by their IRP methodologies and analyses of both supply and demand side resources and the selected plans contained in the 2013 IRP Updates.

A. The Companies' Appropriately Evaluated and Included EE and Renewables in their 2013 IRP Updates.

While noting that DEC "led the Southeast in energy savings from efficiency,"¹⁶ in both 2011 and 2012, as in previous IRP comments, SACE and Sierra Club allege that DEC and DEP are not planning to capture all cost-effective EE and maximize renewable energy opportunities. DEC and DEP have included significant levels of EE and renewable resources in their 2013 IRP Updates, surpassing the levels included in the 2012 IRP. As to EE, DEC projects that it will have delivered over 10,510,000 MWHs of

¹⁶ Initial Comments of Sierra Club and Southern Alliance for Clean Energy, April 11, 2014 ("SACE Comments"), p. 69-70

EE savings between 2009 and 2028. The estimated peak load impact of these EE savings is 1,734 MWs in that same timeframe. In addition, DEC projects over 1,060 MWs of peak load savings from DSM programs by 2028. DEP projects that it will have delivered 4,403,000 MWHs of EE savings between 2009 and 2028. The estimated peak load impact of these EE savings is 1,068 MWs in that same timeframe. In addition, DEP projects 789 MWs of peak load savings from DSM programs by 2028.

The Companies have included in their 2013 IRP Updates the level of EE they believe is reasonably achievable and economic. In response to a data request seeking the feasibility assumptions of the increased EE levels asserted in their comments, SACE and Sierra Club admitted that they did not conduct a market potential study or make assumptions regarding participation (penetration) rates, or technology to achieve penetration rates, for purposes of preparing their comments, but that their comments were “informed” by their review of market potential studies performed for DEC and other southeastern electric utilities.¹⁷ SACE and Sierra Club do not appear to realize that potential does not equal cost-effective or achievable. In their comments criticizing DEC’s EE cost assumptions, SACE and Sierra Club rely upon the LBNL study by Barbose. (SACE Comments at p. 31). While this study does make an attempt to adjust cost projections for size of first year impacts, it does not adjust for cumulative market penetration (i.e., the more that has been achieved on a cumulative basis, the higher must be the costs per kWh achieved). Furthermore, the study essentially relies on past spending and impacts to make its projection, which DEC and DEP assert is a very unreliable methodology.

¹⁷ SACE and Sierra Club Response to DEC and DEP First Data Request No. 8, May 5, 2014.

SACE and Sierra Club complain about the EE costs assumed by the Companies in their 2013 IRP Updates and which deserve a brief response. On pages 27-28 of their comments, SACE and Sierra Club note four alleged flaws with DEC's EE cost assumptions and methods. As to the use of the 60% market saturation, this is based upon the market potential study prepared for DEC and is consistent with reasonable adoption curves for typical measures. As to the criticism that there is no provision for introduction of new EE technology or for reduction in costs of future EE technology, SACE and Sierra Club's comments ignore that generation technology is treated exactly the same way in the IRP (no assumptions are made that generation technology costs will decrease over time). As to their assertion that economies of scale serve to reduce EE program costs as more customers participate, this ignores the reality of EE program implementation: as less expensive EE measures are depleted (the "low hanging fruit"), more expensive measures must be offered. Finally as to the criticism of the 30% program overhead costs, this is a legitimate program expense (and which is approved through the cost recovery mechanism) based on the market potential study, that must be included or the total utility costs to implement EE will be understated. SACE and Sierra Club have a final criticism that the Companies' long-term EE cost forecast indicates cost escalation in excess of the rate of inflation. (SACE Comments at p. 52-53). Again, these intervenors ignore the fact that as an initial low cost EE resource reaches its market potential, as in generation dispatch, the utility has to move "up the stack" to the next higher cost EE resource. The two drivers of costs are inflation and the incremental cost of the next EE resources. It is axiomatic, therefore, that the combination of these two factors will result in the projected increase in the unit cost of EE exceeding the rate of inflation.

SACE and Sierra Club propose a list of EE programs that the Companies should consider. (SACE Comments at p. 73). In response to a data request, these intervenors revealed that they “did not review the program costs, program participation, or perform participation studies” as to their proposed programs.¹⁸ As to specific EE programs, DEC and DEP have collaborative groups which discuss and vet all programs and would welcome the opportunity to discuss these programs at their collaborative groups. DEC and DEP have a bias toward EE, which is reflected in the IRP process by putting EE ahead of other resources and locking in the programs and impacts before any additional generation resources are considered. DEC and DEP make their projections of EE impacts in conjunction with an independent assessment of the market potential for EE for each utility’s service territory, a critical component that cannot be overlooked.

As discussed previously in these Reply Comments, the 2013 IRP Updates also include an Environmental Focus Scenario that reflects significantly greater levels of EE than in the base plan. DEC and DEP continues their commitments to EE and will be seeking to achieve this higher level of EE. However, until the Company has more certainty that it can achieve these aspirational levels of EE, it is using the more moderate assumptions based on market studies in the IRP base plan.

SACE and Sierra Club also criticize the Companies’ alleged insufficient reliance upon renewables in their IRP Updates. DEC’s 2013 IRP Update base case includes 849 MW of renewable resources by 2018 and 2,028 MW by 2028. DEP’s 2013 IRP Update base case includes 297 MW of renewable resources by 2018 and 802 MW by 2028. The Companies’ Environmental Focus Scenarios evaluated inclusion of approximately twice

¹⁸ SACE and Sierra Club Response to DEC and DEP First Data Request No. 7, May 5, 2014.

the amount of renewables as in the base cases. The Companies believe renewable resources, particularly solar, are increasingly important resources and this is adequately reflected in the 2013 IRP Updates.

B. SACE and Sierra Club's Environmental Compliance Cost Analysis and Resulting Conclusions are Flawed.

In their comments, SACE and Sierra Club also allege that their "analysis" of future environmental requirements "strongly suggests that retirement of a minimum 5,000 MW of coal capacity is likely to be the most cost-effective solution." (SACE Comments at p. 24-25). In response to data requests, however, SACE and Sierra Club responded that they had not performed any analysis of which coal units DEC and DEP should retire or when.¹⁹ Appendix G to both the DEC and DEP 2013 IRP Updates contains extensive discussion of potential future environmental requirements that will impact the Companies' operations in the coming years, including those related to the Cross-State Air Pollution Rule (CSAPR) and the Clean Air Interstate Rule, the Mercury and Air Toxics Standard (MATS), National Ambient Air Quality Standards, SO₂ Standards, Particulate Matter Standard, Greenhouse Gas Regulation, Cooling Water Intake Structures (CWA 316(b)), Steam Electric Effluent Guidelines, and Coal Combustion Residuals. The Companies' IRP models build in all known capital and O&M costs for environmental compliance. SACE and Sierra Club assert reliance upon a Coal Asset Valuation Tool ("CAVT"), which incorporates assumed environmental costs. (SACE Comments at p. 10). All of DEC and DEP's coal units already have FGDs (or "scrubbers), SCRs or SNCRs or baghouses, with the exception of the Lee Steam Station

¹⁹ SACE and Sierra Club Response to DEC and DEP First Data Request No. 9, April 30, 2014.

in South Carolina, which is scheduled for retirement in 2014 (and conversion of one unit to natural gas in 2015). As a result, DEC and DEP believe that their remaining coal units are compliant with MATS and CSAPR.

SACE and Sierra Club's coal retirement analysis based upon the CAVT tool understates replacement generation costs and overstates future environmental compliance costs, which results in invalid conclusions. Based upon SACE and Sierra Club's responses to data requests,²⁰ the Companies note that the future environmental control costs represented by the "medium scenario" of the CAVT tool relied upon by these intervenors are not representative of the Companies' expected outcome with Mercury Air Toxic Rule (MATS) and 316(b) requirements. According to the CAVT information provided, it appears that costs for baghouses (except for Cliffside 6), activated carbon injection ("ACI"), Cooling Towers (except Mayo, Cliffside 5 & 6) were included for all DEC and DEP units. As noted previously, Duke Energy has tested all coal units for compliance with MATS and compliance can be met without the installation of baghouses and with limited ACI injection at Allen and Marshall 4. Also based on the 316(b) rule finalized in May 2014, cooling towers are not anticipated to be required. An example of the impact of SACE and Sierra Club's inclusion of baghouses, ACI and cooling towers is the overstatement of more than \$1 Billion (in \$2012) in environmental compliance costs for DEC's Belews Creek Steam Station alone.²¹ Accordingly, SACE and Sierra Club's assumptions regarding future environmental costs for the Companies' are invalid and their resulting conclusions must be disregarded.

²⁰ SACE and Sierra Club Response to DEC and DEP First Data Request Nos. 2, 3, 4 and 5, April 30, 2014, and May 1, 2014.

²¹ Additional SACE and Sierra Club CAVT errors such as the assumed VOM cost associated with the operation of the cooling towers on Cliffside 6 were noted.

SACE and Sierra Club's responses to data requests further revealed questionable carbon price projections and resulting natural gas prices, as well as replacement capacity costs. The Companies assert that the CO₂ price projections used by SACE and Sierra Club were high based on the current regulatory environment. The CAVT assumed the following nominal price projections:

- Lenient case: the price projection ranged from 18 \$/ton in 2020 and increasing to 72 \$/ton in 2034
- Mid case: 25 \$/ton increasing to 89 \$/ton by 2034
- High case: 36 \$/ton increasing to 124 \$/ton in 2034.

For reference, the Companies' IRP Updates included a CO₂ price of 17 \$/ton increasing to 50 \$/ton in 2034. The assumed CO₂ price has a major bearing on the cost effectiveness of coal, and nuclear for that matter. Given SACE and Sierra Club's assumptions regarding high future CO₂ prices, it is interesting that their IRP comments did not advocate for DEC and DEP to include significantly more new nuclear generation in their 2013 IRP Updates. Furthermore, the SACE and Sierra Club analysis does not properly reflect the impact of their assumed significant coal retirements and high CO₂ prices on the price of natural gas. If 200 to 300 GW of coal were retired and replaced with natural gas, from purely a supply and demand perspective there would be a price response reflected in the cost of natural gas which is not reflected in the CAVT model. Finally, the Companies believe that SACE and Sierra Club understate replacement capacity cost. Fundamentally, the price of replacement capacity will move to the equivalent of the price of new generation. For all the foregoing reasons, the SACE and Sierra Club CAVT analysis and conclusions should be disregarded.

It is telling that, in response to several data requests, SACE and Sierra Club noted that they "did not include proposed resource additions and mix of resources" in their

comments.²² If SACE and Sierra Club are not proposing an alternate resource mix to replace the 5,000 MW of coal they claim DEC and DEP should retire, then that reveals the illegitimacy of their assertion. If these parties don't have a proposed alternate resource mix and associated costs to analyze and compare, then it belies the validity of the purported cost-effectiveness of their proposal and frustrates any meaningful consideration of their comments.

C. SACE and Sierra Club's Reserve Margin Criticism is Misplaced.

While acknowledging that the Companies' reserve margins appear reasonable, SACE and Sierra Club contend that the Companies' reserve margins may be too high in light of treating demand response as a resource instead of an offset to load. (SACE Comments at p. 90-95). SACE and Sierra Club erroneously believe the Company would keep the same target reserve margin with the change in methodology. This is an incorrect assumption. If DEC and DEP adopt the methodology to treat DSM as a reduction to load, the Companies will be *required to raise their reserve margin* to maintain the same level of reliability.

Target reserve margins are developed to achieve a specific level of reliability, typically expressed in a loss of load expectation ("LOLE") of one day in ten years. This LOLE level is the constant, irrespective of whether DSM is treated as a resource or as a load reduction. Below are results from DEC's most recent reserve margin study, conducted by Astrape Consulting (an energy consulting firm with a focus on resource adequacy and resource planning) in 2012. As shown in the table, Astrape Consulting

²² SACE and Sierra Club Response to DEC and DEP First Data Request Nos. 6, 9, 10, 11, May 5, 2014.

proposed a minimum target reserve margin of 14.5% if DSM (called DR for Demand Response by Astrape) is treated as a resource and 15.25% if treated as a reduction to load. The Company chose to treat DSM as a resource and used the 14.5% Reserve Margin. If the Company were to adopt the methodology to treat DSM as a load reduction as SACE and Sierra Club appear to desire, using the higher 15.25% minimum target planning reserve margin would be appropriate.

<i>RM with DR as a resource</i>	<i>Physical</i>
	LOLE: 1 day in 10 Yr
Company	
DEC	14.50%

<i>RM with DR removed from load</i>	<i>Physical</i>
	LOLE: 1 day in 10 Yr
Company	
DEC	15.25%

SACE and Sierra Club contend that DEC's 2017 reserve margin was underestimated by 102 MWs and that DEP's 2017 reserve margin was underestimated by 128 MWs, for a total of 230 MWs. (SACE Comments at p. 91). The table below shows the level of resources needed to meet the minimum target reserve margin for Duke Energy Carolinas in 2017. The table below demonstrates that there is virtually no difference (25 MWs on an almost 20,000 MW load) in the level of resources needed regardless of the way DSM is treated. The math would be comparable for the DEP system.

	DSM as a Resource	DSM as a Reduction to Load
System Peak, Net of EE	19,445	19,445
Cumulative DSM		1,118
System Peak, Net of EE & DSM		18,327
Minimum Required Reserves (%)	14.5%	15.25%
Minimum Required Reserves	2,820	2,795

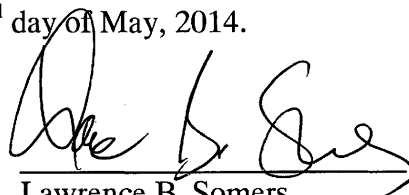
Accordingly, SACE and Sierra Club's claim that the Companies' treatment of DSM as a resource may have resulted in excess reserves is in error. The Companies have properly calculated their reserve margins.

In conclusion, the Companies assert that their IRPs and REPS Compliance Plans meet all applicable requirements and any SACE and Sierra Club's arguments to the contrary should be dismissed.

CONCLUSION

In conclusion, the Companies submit that their 2013 Integrated Resource Plans Updates and Renewable Energy and Energy Efficiency Portfolio Standards Compliance Plans meet the requirements of all applicable statutes, Commission Rules, and Commission orders and should be approved. Furthermore, DEC and DEP assert that no party has raised credible reasons as why an evidentiary hearing is necessary, and the requests for same should be denied.

Respectfully submitted, this the 23rd day of May, 2014.



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APPENDIX L: CARBON NEUTRALITY PLAN

Greenhouse Gas Reduction Compliance Plan – Cliffside Unit 6

On January 29, 2008, the NCDQA issued the Air Quality Permit to Duke Energy Carolinas for the Cliffside Unit 6. The Permit specifically requires that Duke Energy Carolinas implement a Greenhouse Gas Reduction Plan (Greenhouse Plan), and specifically obligates Duke Energy Carolinas to take the following actions in recognition of NCDQA's issuance of the Permit for Cliffside Unit 6: (1) retire 800 MWs of coal capacity in North Carolina in accordance with the schedule set forth in Table L.1, which is in addition to the retirement of Cliffside Units 1 – 4; (2) accommodate, to the extent practicable, the installation and operations of future carbon control technology; and (3) take additional actions to make Cliffside Unit 6 carbon neutral by 2018.

With regard to obligation (1) identified above, as shown in Table L.1 below, Duke Energy Carolinas proposes to retire up to 1299 MW at the following generating units to satisfy the required retirement schedule set forth in the Greenhouse Plan.

Table L.1 - Cumulative Coal Plant Retirements

	Greenhouse Plan Retirement Schedule Capacity in MW	IRP Retirement Schedule Capacity in MW (Appendix B p. 60)¹	Description for IRP Retirement Schedule
by end of 2011		113	Buck 3 & 4
by end of 2012		389	Dan River 1-3
by end of 2013		1099	Riverbend 4 - 7, Buck 5 & 6
by end of 2015	350	1299	Lee 1&2; Note ²
by end of 2018	800	1299	

¹ In the 2013 IRP, this data appears in Appendix B, page 60. Plant retirement dates have been accelerated for BK 5&6 and Riverbend 4-7; . References have been updated to match the 2013 IRP.

² The IRP Retirement Schedule indicates that the retirements would exceed the Greenhouse Plan by close to 50%.

With respect to obligation (2) listed above, the requirement to build Cliffside Unit 6 to accommodate future carbon technologies has been met by allocating space at the 1100 acre site for this equipment and incorporating practical energy efficiency designs into the plant.

With respect to obligation (3) to render Cliffside Unit 6 carbon neutral by 2018, the proposed plan to achieve this requirement is set forth below. The Greenhouse Gas Reduction Plan states that the plan for carbon neutrality:

may include energy efficiency, carbon free tariffs, purchase of credits, domestic and international offsets, additional retirements or reduction in fossil fuel usage as carbon free generation becomes available, and carbon reduction through the development of smart grid, plug in hybrid electric vehicles or other carbon mitigation projects. Such actions will be included in plans to be filed with the NCUC and will be subject to NCUC approval, including appropriate cost recovery of such actions. In addition, the plans shall be submitted to the Division of Air Quality, which will evaluate the effect of the plans on carbon, and provide its conclusions to the NCUC.

Duke Energy Carolinas included the plan for carbon neutrality in the 2011 IRP in order to satisfy the requirement to file and seek approval of the plan from the NCUC as required by the NCDAQ Air Permit. The NCUC's Order Approving 2011 Annual Updates to 2010 Biennial Resource Plans and 2011 REPS Compliance Plans issued on May 30, 2012, states that "the Commission is approving the Plan itself as a reasonable path for Duke's compliance with the carbon emission reduction standards of the air quality permit and is not approving any individual specific activities nor expenditures for any activities shown in the Plan."

The estimated emissions reductions required to render Cliffside Unit 6 carbon neutral in 2018 are approximately 5.3 million tons of carbon dioxide (the Emission Reduction Requirement). The Company calculated the estimated emission reductions by estimating the actual tons of carbon dioxide emissions that will be released per year from Cliffside Unit 6 less 681,954 tons of carbon dioxide emissions that was historically generated from Cliffside Units 1 – 4 and will be eliminated by the retirement of these units. (See Table J.2 below.)

Table L.2 - Emission Reduction Requirement

Actions	Tons of CO₂ Equivalent Emissions	Notes
Cliffside Unit 6	6,000,000	Expected Annual Emissions (based on an approximate 90% capacity factor)
Less Cliffside Units 1 – 4	(681,954)	Average of emissions in 2007 & 2008 ¹
Total Increase	5,318,046	Emissions Reduction Requirement

¹The emissions attributable to coal plant retirements are identified as the highest two year average CO₂ emissions for the five years prior to the operations of Unit 6 in 2012, consistent with the methodology for calculating emissions for major modification under the Clean Air Act Prevention of Significant Deterioration regulations.

The Company's plan for meeting the Emissions Reductions Requirements includes actions from multiple categories and associated methodologies for determining the offset value known as "Qualifying Actions" (defined below and as further indicated in Table J.3).

For 2018, the Company has identified approximately 9.3 million annual tons of carbon dioxide emissions reductions and a life-time credit of 600,000 tons of carbon dioxide bio-sequestration as eligible Qualifying Actions. (See Table L.3) The Qualifying Actions include the avoidance of carbon dioxide emission releases from coal plant retirements, addition of renewable resources, implementation of energy efficiency measures, nuclear and hydropower capacity upgrades. This also includes the expected retirement of coal-fired operations at Lee Units 1, 2 and 3 in South Carolina in 2015. In addition, carbon dioxide bio-sequestration offsets from the Greentrees program, which sequesters carbon as trees grow, is identified as a Qualifying Action.

While the reductions associated with retirements for each of the coal plants shall be the same each year, the reductions for the remaining Qualifying Actions will vary based on actual results for each of the categories and the then current system carbon intensity factor. The system carbon intensity factor shall be equal to the actual carbon dioxide emissions of all Company-owned generation dedicated for Duke Energy Carolina customers divided by the megawatt hours generated by those same resources (the “Conversion Factor”).

Table L.3 - Qualifying Actions for carbon dioxide emission reductions

Categories	Tons of CO ₂ Equivalent Emissions	Methodology Description
Buck 3	216,202	Average of emissions in 2007 & 2008 ¹
Buck 4	139,429	Average of emissions in 2007 & 2008 ¹
Buck 5	606,837	Average of emissions in 2007 & 2008 ¹
Buck 6	653,860	Average of emissions in 2007 & 2008 ¹
Riverbend 4	462,314	Average of emissions in 2007 & 2008 ¹
Riverbend 5	435,895	Average of emissions in 2007 & 2008 ¹
Riverbend 6	684,010	Average of emissions in 2007 & 2008 ¹
Riverbend 7	710,023	Average of emissions in 2007 & 2008 ¹
Dan River 1	249,900	Average of emissions in 2007 & 2008 ¹
Dan River 2	282,944	Average of emissions in 2007 & 2008 ¹
Dan River 3	677,334	Average of emissions in 2007 & 2008 ¹
Lee 1 ⁵	335,583	Average of emissions in 2007 & 2008 ¹
Lee 2 ⁵	390,965	Average of emissions in 2007 & 2008 ¹
Lee 3 ⁵	783,658	Average of emissions in 2007 & 2008 ¹
Conservation	1,218,417	In 2018, 3,046,042 MWH “Conservation and Demand Side Management Programs” ² is multiplied by a Conversion Factor of 0.40.
Renewable Energy	863,035	In 2018, 849 MW per the Table 5-A “MW Nameplate Capacity”. ³ Is multiplied by an assumed 30% (wind), 20% (solar), and 85% (biomass) capacity factor and a Conversion Factor of 0.40.
Bridgewater Hydro	7,997	Indicates 8.75 MW increase in capacity. This is multiplied by a 26% capacity factor and a Conversion Factor of 0.40.
Nuclear Uprates	606,052	Assumed 188 MW of nuclear uprates by June of 2018. ⁴ Assumed a 92% capacity factor and a Conversion Factor of 0.40.
Total Annual	9,324,455	

¹ The emissions attributable to coal plant retirements are identified as the highest two year average CO₂ emissions for the five years prior to the operations of Unit 6 in 2012, consistent with the methodology for calculating emissions for major modifications under the Clean Air Act Prevention of Significant Deterioration regulations. Company reserves the right to use any credits for reduction of nitrogen oxide, sulfur dioxide and carbon dioxide emissions generated by retirement of units retired under the plan consistent with provisions of State and federal law.

² Data is from Appendix D, page 90 of the 2013 IRP.

³ Data is from the Table 5-A on page 18 of the 2013 IRP. Actual nameplate capacity is 849 MW. The contribution to peak is 425 MW.

⁴ Data is a portion of the total capacity addition on Appendix B, page 59 of 2013 IRP prior to June 2018.

⁵ Lee Units 1, 2 and 3 are planned for retirement by April 15, 2015. Alternatively, Duke Energy is converting Lee 3 to natural gas to allow continued operation for peak generation demand only (at a low annual capacity factor). Any CO₂ from operating with natural gas would be subtracted from the reductions shown in the table.

As the proposed Plan methodology has been approved, Duke Energy Carolinas shall provide a compliance report in the 2019 IRP filing indicating what Qualifying Actions were used to meet the Emission Reduction Requirement in 2018. The expected Qualifying Actions total 9.2 million tons of emission reductions by 2018. The Company's proposed Qualifying Actions clearly demonstrate that identified reductions can more than exceed the Required Emissions Reduction estimate of 5.3 million tons.

CERTIFICATE OF SERVICE

I, Lawrence B. Somers, certify that a copy of Duke Energy Carolinas and Duke Energy Progress' Reply Comments, in Docket No. E-100, Sub 137, has been served by electronic mail, hand delivery or by depositing a copy in the United States mail, postage prepaid to the following parties for record:

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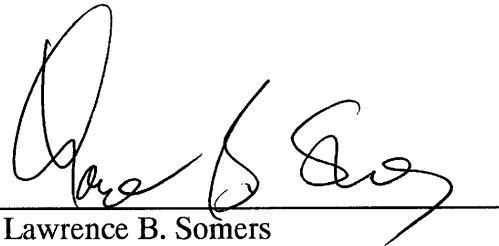
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