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Clerk's Office
N.C. Utilities Commission

VIA FEDERAL EXPRESS

Ms. Gail Mount
Chief Clerk
North Carolina Utilities Commission
430 North Salisbury Street
Dobbs Building
Raleigh, NC 27603-5918

RE: Investigation of Integrated Resource Planning in North Carolina - 2012
Docket No. E-100, Sub 137

Dear Ms. Mount:

Enclosed for filing in the above-referenced docket are an original and thirty-one (31) copies of Brief of Southern Alliance for Clean Energy and the Sierra Club. Please file the original and return a "filed" stamped copy to me in the enclosed envelope. I am also emailing a copy of the brief in word version to briefs@ncuc.net. By copy of this letter, I am serving all parties of record on the service list.

Sincerely,

Robin A. Dunn

Robin G. Dunn

GT/rgd
Enclosure
cc: Parties of Record

PSM
7-Coram
AG
Waters
Green
Conrad
Duffy
Hawke
Kito
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Clerk's Office
N.C. Utilities Commission

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION
DOCKET NO. E-100, SUB 137

In the Matter of)
2012 Biennial Integrated Resource Plans) **BRIEF OF SOUTHERN ALLIANCE**
and Related 2012 REPS Compliance) **FOR CLEAN ENERGY AND**
Plans) **THE SIERRA CLUB**

PURSUANT TO North Carolina Utilities Commission Rule R1-25, the Commission's July 15, 2013 Order Denying Request for Evidentiary Hearing and Allowing Proposed Orders and Briefs, and the Commission's August 22, 2013 Order Granting Extension of Time, intervenors Southern Alliance for Clean Energy ("SACE") and the Sierra Club, through counsel, file this brief on issues raised by the 2012 biennial integrated resource plans ("IRPs") of Duke Energy Carolinas, LLC ("DEC") and Duke Energy Progress, Inc. ("DEP"), collectively ("the Companies").

I. SUMMARY

In certain key respects, the DEC and DEP 2012 IRPs improve upon the Companies' previous IRPs. Noteworthy improvements include the following:

- DEC significantly increased its "High EE/DSM Case," as compared to its 2011 IRP, to reflect higher levels of energy efficiency.
- For the first time, DEP analyzed a high energy efficiency case, which would lower total system costs by more than \$4 billion compared to DEP's "preferred resource plan." DEP's base energy efficiency case also includes greater levels of energy savings than in its 2011 IRP.
- Both Companies' EE programs are performing well, saving significant amounts of energy—and saving customers money—in a cost-effective manner.
- Both Companies' experience with REPS compliance, and DEC's internal analysis, demonstrates that renewable energy resources are available and can be deployed at a reasonable cost.

- Based on studies ordered by the Commission, both Companies have revised their reserve margins to more reasonable levels, which could defer or eliminate the need for new power plants.
- Both Companies plan to retire their oldest, dirtiest coal units, which will reduce cost and risk to customers.

Notwithstanding these key improvements, each Company's IRP suffers from flaws that result in a "preferred plan" that is more costly, more risky, and has greater environmental impacts than would be a plan based on robust assumptions and developed according to best practices.¹ To correct these flaws, SACE and the Sierra Club recommend that DEC and DEP implement the following improvements:

- DEC and DEP should include significantly more energy efficiency in their preferred resource plans, to offer customers lower costs and lower risks;
- DEC and DEP should evaluate energy efficiency using an approach equivalent to the approach used for supply-side resources;
- DEC and DEP should improve their energy efficiency forecasting and pursue additional opportunities to grow the efficiency resource in the long term;
- DEC and DEP should evaluate and include in their IRP analysis the potential for increased levels of renewable energy resources beyond minimum REPS compliance to help meet customers' energy and capacity needs and moderate regulatory risk, and DEP should develop a long-term plan to grow renewable resources;
- DEC and DEP should each conduct, and explicitly address in their IRPs, a rigorous evaluation of the economics of continuing to operate scrubbed coal units;
- DEC should align its treatment of demand response, namely the unnecessary requirement for backstand reserves, with that of DEP, thus reducing its reserve margin;

¹ SACE and the Sierra Club filed initial comments with the Commission on February 4, 2013. In their reply comments, DEC and PEC critique SACE and Sierra Club's initial comments as "duplicative" of arguments advanced by SACE regarding the Companies' 2010 and 2011 IRPs. Duke Energy Carolinas and Progress Energy Carolinas' Reply Comments (March 5, 2013) at 14, n. 11. To the extent that SACE and Sierra Club's arguments are duplicative of arguments previously advanced, any duplication is because the Companies have failed to address persistent and important flaws in their IRPs.

- Each Company should conduct a more complete evaluation of the risks of construction delays and cost increases associated with new nuclear generation, using robust assumptions; and
- Each Company should evaluate the macroeconomic impacts of its resource portfolios.

II. LEGAL FRAMEWORK FOR RESOURCE PLANNING

N.C. Gen. Stat. § 62-110.1(c) requires the Commission to “develop, publicize, and keep current” an analysis of the State’s long-range needs for electricity. In North Carolina, electric utility resource planning must result in the “the least cost mix of generation and demand-reduction measures which is achievable” N.C. Gen. Stat. § 62-2(3a). This “least cost mix” includes the “entire spectrum of demand-side options, including but not limited to conservation, load management and efficiency programs.”

Id. As the Commission has explained,

Integrated resource planning is an overall planning strategy which examines conservation, energy efficiency, load management, and other demand-side measures in addition to utility-owned generating plants, non-utility generation, renewable energy, and other supply-side resources in order to determine the least cost way of providing electric service. The primary purpose of integrated resource planning is to integrate both demand-side and supply-side resource planning into one comprehensive procedure that weighs the costs and benefits of all reasonably available options in order to identify those options which are most cost-effective for ratepayers consistent with the obligation to provide adequate, reliable service.

North Carolina Utilities Commission, Annual Report Regarding Long Range Needs for Expansion of Electric Generation Facilities for Service in North Carolina (November 7, 2012).

In furtherance of these requirements, the Commission conducts an annual investigation into the electric utilities’ IRPs. Commission Rule R8-60 requires each electric utility to file a biennial report of its integrated resource planning process in even-

numbered years, and in odd-numbered years, an annual report updating its most recent biennial report. As the Commission stated in its order on the 2009 IRPs, “[t]he biennial reports are to contain all required information, full and robust analyses and sensitivities, which should encompass a range of scenarios including potential regulatory changes.” Order Approving Integrated Resource Plans and REPS Compliance Plans, Docket Nos. E-100, Sub 118 and E-100, Sub 124 (Aug. 10, 2010) (“2009 IRP Order”) at 20.

Commission Rule R8-60 sets forth certain minimum IRP filing requirements.

The rule provides, among other things, that each utility must:

- Provide a 15-year forecast of demand-side resources. Rule R8-60(c)(1).
- Conduct a “comprehensive analysis” of demand-side and supply-side resource options. Rule R8-60(c)(2) and (f).
- “[C]onsider and compare . . . both demand-side and supply side [resource] options, to determine an integrated resource plan that offers the least cost combination (on a long-term basis) of reliable resource options for meeting the anticipated needs of its system.” Rule R8-60(g).
- “[P]rovide the results of its overall assessment of existing and potential demand-side management programs, including a descriptive summary of each analysis performed or used by the utility in the assessment” as well as “general information on any changes to the methods and assumptions used in the assessment . . .” Rule R8-60(i)(6). The results of the assessment must include programs “evaluated but rejected” by the utility. *Id.*
- Describe and summarize “its analyses of potential resource options and combinations of resource options performed by it . . . to determine its integrated resource plan.” Rule R8-60(i)(8).

III. HIGHER LEVELS OF ENERGY EFFICIENCY WOULD LOWER COSTS AND RISK TO CUSTOMERS.

Energy efficiency is the least-cost system resource, and increased levels of energy efficiency lower total system costs. In fact, modeling conducted for the DEC and DEP 2012 IRPs shows that resource plans with more aggressive, but still achievable, levels of

energy efficiency would save **roughly \$9 billion** across the Companies' combined service territory compared to the Companies' "preferred" plans. Furthermore, data supporting both IRPs shows that incorporating the utilities' High Energy Efficiency/Demand Side Management ("High EE/DSM") cases has lower risk than does any portfolio using base case EE/DSM assumptions. DEC and DEP, however, do not evaluate efficiency as a resource equivalent to supply-side resources. As a result, they significantly underestimate and underutilize EE in their IRPs, resulting in plans that favor more expensive, riskier supply-side resources and do not result in the "least cost mix" of resource options.

A. IRP Modeling Shows That the Companies Could Save Customers Money and Reduce Risks to Customers By Increasing Levels of Energy Efficiency in their IRPs.

1. Increased EE/DSM would lower total system cost.

DEC modeled three resource portfolios—gas, nuclear, and regional nuclear—in both base case and sensitivity analyses. DEC 2012 IRP at 105. For the base case, each portfolio included EE/DSM resources based on DEC's internal expectations for demand-side resources and its 2011 Market Potential Study. *Id.* at 103. DEC also evaluated a High EE/DSM case sensitivity, which reflects higher levels of savings from DEC's EE/DSM programs as compared to the base case. *Id.* at 39-40. DEC's analysis shows that the three resource portfolios it modeled all cost significantly less—**at least \$4.7 billion less**—under the High EE/DSM case sensitivity than under the Base EE/DSM Case.

DEP developed four alternative resource portfolios, Plans A through D, in its sensitivity analysis, plus an "Aspirational Plan," which consists of DEP's Plan A modified to include the High EE case. DEP modeled the High EE case under the same

assumptions it used to model Plans A-D in the “Current Trends” scenario. DEP 2012 IRP at A-4-5. DEP did not choose to pass the High EE sensitivity to the second scenario analysis phase of resource planning. *Id.* at A-5. For the base EE case, each alternative resource portfolio included EE/DSM resources based on DEP’s 2012 potential assessment. *Id.* at E-12. For the High EE case sensitivity, DEP forecast a higher level of savings from DEP’s EE/DSM programs, “serv[ing] as an aspirational target for future EE plans and programs.” *Id.* at A-5.² DEP’s analysis shows that its High EE case sensitivity ***costs at least \$4.3 billion less*** than the Base EE Case.

In sum, DEC’s and DEP’s quantitative analyses illustrate that a “least cost mix” of resource options includes increased levels of energy efficiency as compared to the Companies’ base cases. The High EE/DSM cases represent nearly \$9 billion in cost savings, or roughly 5 percent of the total cost of the DEC and DEP system, including reduced capital costs due to avoided new generation. In light of these significant cost savings to customers, DEC and DEP should increase the role of energy efficiency in their overall resource mixes.

2. Increased EE/DSM would expose customers to a lower risk of cost increases.

In addition to lowering total system cost, energy efficiency also lowers the risk profile of a resource mix. The qualitative analysis of risk in each Company’s IRP, when applied to DSM/EE resources, shows that all portfolios with High EE/DSM resources expose customers to less risk than the “preferred plan” or other supply-side alternatives. The IRPs present only a cursory discussion of risks associated with increased levels of EE/DSM, such as uncertainties about customer participation and regulatory approval, and

² The adequacy of the PEC’s Base and High EE case forecasts is discussed in Section IV.

do not compare these risks to the risks associated with the supply-side resources included in the preferred portfolios. Despite this shortcoming in both plans, data from DEC and DEP's IRP analyses show that the risks presented by demand-side resources are, in fact, smaller than those for supply-side resources.

DEC and DEP customers bear a substantial risk of price increases if fuel prices and environmental compliance costs are higher than anticipated because these costs are passed through to customers. Increased EE/DSM resources are more effective than conventional supply-side resources at reducing the risk of fuel price increases, and this should have been considered in the Companies' IRPs. As an emissions-free resource, increased levels of EE/DSM can also reduce environmental compliance costs, such as a price on CO₂ emissions. The Companies should not ignore increased levels of EE/DSM as a way to reduce environmental compliance costs and impacts in light of increasingly stringent regulations.

Another source of risk to customers is the potential for capital cost increases. EE/DSM programs present far lower capital cost risks than do supply-side resources. To the extent that EE/DSM capital costs do escalate, the risks are mitigated by the nature of EE/DSM program impacts. The cost of demand-side resources are phased in on an annual basis, rather than in large increments as with a new power plant.

EE/DSM resources also have a lower risk of schedule delays than supply-side investments. Large power plant projects are relatively inflexible in terms of development schedule, making it difficult to adjust in response to changing conditions and increasing the risk of delay. Unlike large power plant projects, EE/DSM programs are flexible and can be managed to more closely match load growth because these resources are deployed

in annual increments. Compared to supply-side resources, energy efficiency programs are relatively straightforward and inexpensive to expand, cancel, or modify in response to changes in projected (or even experienced) load growth.

In sum, both DEC and DEP should evaluate the risks associated with EE/DSM programs using an approach that is equivalent to the approach they use for supply-side resources. DEC and DEP should then explicitly analyze whether a higher level of EE/DSM programs, which each Company's quantitative analysis shows lowers total system costs and risk, should be adopted in future recommended plans.

B. DEC and DEP Failed to Properly Consider Energy Efficiency in Their Evaluation of Resource Options.

Even though higher levels of EE would save customers money and reduce system-wide costs and risk, DEC and DEP do not evaluate efficiency as a resource equivalent to supply-side resources. As a result, they significantly underestimate and underutilize EE in their IRPs, and present plans that favor more expensive, riskier supply-side resources and do not result in the "least cost mix" of resource options.

Both DEC's and DEP's energy efficiency programs are performing well at low cost, demonstrating that energy efficiency is a least-cost system resource that delivers significant energy savings. In both 2010 and 2011, DEC saved about 0.7 percent of its retail sales, a level of energy savings more than double the target in the modified Save-A-Watt plan. In 2010 and 2011, DEP saved roughly 0.3% and 0.4% percent of its retail sales, respectively.

Despite successful program delivery and improved efficiency forecasting, however, neither Company's actual savings or forecasted future program impacts reflect the level of savings that are being achieved by many leading energy efficiency portfolios.

Moreover, problems persist with the Companies' energy efficiency forecasting.

Therefore, while DEC and DEP's EE program performance is a good start, there is ample room for improvement, both in terms of the integration of EE in the IRP and EE program offerings, as discussed below.

1. DEC and DEP continue to undervalue efficiency in their long-term efficiency forecasts, despite the Companies' actual experience.

DEC projects that it will achieve between 10% (in the base case) and 18% (in the High EE/DSM Case) in cumulative energy savings from energy efficiency programs by 2031, the end of the Company's IRP planning cycle. Similarly, DEP projects cumulative savings of 7% (base case) to 16% (High EE/DSM Case) by 2032. These cumulative projections amount to annual savings of far less than 1% of sales per year, a level achieved by leading utilities and consistent with commitments made by DEC and DEP in connection with the Duke Energy-Progress Energy merger and DEC's long-term performance goals in the modified Save-A-Watt settlement agreement.³

DEC and DEP should improve their efficiency modeling to allow the resource to grow in the long term, consistent with the long-term efficiency forecasts of electric utilities that have successfully delivered efficiency savings for decades. One major barrier to proper integration of EE into the DEC and DEP IRPs is each Company's modeling of energy efficiency as a fixed-model input, best characterized as an adjustment

³ In Docket No. E-7, Sub 831, DEC agreed to an overall annual energy efficiency target of at least 1% of 2009 weather-normalized retail sales by 2015. See Agreement and Joint Stipulation of Settlement, Exhibit B at 21, NCUC Docket No. E-7, Sub 831 (approved subject to certain Commission-required modifications on Feb. 9, 2010). In the S.C. Public Service Commission ("SC PSC") proceeding related to the merger of Duke Energy and Progress Energy, Docket No. 2011-158-E, DEC and DEP entered into a settlement agreement with SACE, Environmental Defense Fund, and the S.C. Coastal Conservation League (the "Merger Agreement"), in which, among other things, DEC and PEC agreed to an annual energy savings target of 1% beginning in 2015, and a cumulative target of 7% of retail sales from 2014-2018. The Merger Agreement was approved by the SC PSC in its Order Approving Joint Dispatch Agreement, Order 2012-517 (July 11, 2012) at 43.

to the load forecast, rather than as a resource that may be optimized during the modeling process. While this treatment is appropriate for demand response measures, the industry best practice is to treat energy efficiency investments as equal or even preferred to supply-side resources for planning purposes.⁴

DEC and DEP should use an approach that models energy efficiency as a resource, just as generating plants are modeled on the supply side. For example, the Northwest Power and Conservation Council uses two supply curves for energy efficiency in the model that develops least-cost portfolios.⁵ The use of two supply curves allows for different treatment of discretionary and lost-opportunity energy efficiency resources.⁶

2. PURPA avoided costs do not capture the full value of energy efficiency.

The DEC and DEP energy efficiency potential studies use the utility's avoided cost, as determined in the most recent biennial PURPA avoided cost proceeding, to measure the benefit of DSM/EE for purposes of determining the economic potential for DSM/EE in each utility's service territory. In its comments, the Public Staff expresses concern that the avoided cost used in DEP's and DEC's potential studies—\$0.07 per kWh—may be too high to properly assess the economic potential of DSM and EE in light of the lower avoided cost rates proposed by the IOUs in the current avoided cost proceeding, Docket No. E-100, Sub 136. Comments of the Public Staff (Feb. 5, 2013) (“Public Staff Initial Comments”) at 45-46.

⁴ See, e.g., Aspen Environmental Group and Energy and Environmental Economics, Inc. (Aspen/E3), *Survey of Utility Resource Planning and Procurement Practices for Application to Long-Term Procurement Planning in California: Final Report and Appendices*, prepared for California Public Utilities Commission, April 2009, <http://docs.cpuc.ca.gov/published/Graphics/103213.PDF>.

⁵ *Id.* at 71.

⁶ Discretionary energy efficiency resources are investments that can be advanced or deferred based on near-term market decisions, such as a CFL market promotion. Lost-opportunity energy efficiency resources are programs that take advantage of opportunities due to market or customer circumstances, such as new construction and replace-on-burnout programs.

In light of the Public Staff's concern that the avoided cost estimate in DEC's and DEP's potential studies may be too high to properly assess economic potential, SACE and the Sierra Club conducted an analysis contrasting the PURPA avoided cost used with the real levelized benefit of EE/DSM. This analysis resulted in a real levelized benefit of EE/DSM of \$0.097 per kWh for DEC, and \$0.113 per kWh for DEP—notably higher than the roughly \$0.05/KWh avoided cost rates proposed by DEC and DEP in the current avoided cost proceeding. This analysis revealed that using the PURPA avoided cost underestimates the gross system benefit of EE by 52% (for DEP) and 43% (for DEC). Because the real levelized benefit is calculated using the same method as the real levelized costs of EE/DSM used in the utilities' potential studies, it is a more appropriate benchmark for determining the economic potential of energy efficiency.

By using the PURPA avoided cost to represent the benefit of energy efficiency, DEC's and DEP's market potential studies undervalue the benefit of EE to the utility system and underestimate the economic potential for EE. Basing the avoided cost on the gross system benefit of energy efficiency, the combined economic potential of DEC and DEP is nearly 27,000 GWh, or almost twice the amount estimated by using the alternative lower avoided cost figure of \$0.05/kWh.

Based on these findings, DEC and DEP should update their potential studies to reflect the real levelized benefit of EE/DSM, which would result in higher economic potential, and should also update their achievable potential estimates for energy efficiency based on this higher estimate. The Companies should develop a method for estimating the benefit of energy efficiency that is consistent with the system benefit as demonstrated in their resource planning revenue models. In addition, using the real

levelized benefit of EE/DSM to estimate avoided cost, DEC and DEP should review their current and planned energy efficiency programs, update the programs' cost-effectiveness calculations, and enhance the programs with additional cost-effective measures to achieve greater customer savings.

3. DEP and DEC have enhanced their efficiency portfolios, but many new program opportunities exist.

Both DEC and DEP continue to develop and propose new programs. SACE and the Sierra Club commend DEC and DEP for offering new and innovative EE programs to underserved customers and urge both Companies to pursue additional program opportunities, particularly those targeting energy-intensive customer sectors. In particular, as federal lighting standards are phased in, DEC and DEP must move beyond residential CFL programs, the source of much of their savings in 2010 and 2011. The Companies should also improve existing programs and pursue new energy efficiency program opportunities. DEC and DEP should also pursue opportunities to offer programs tailored to the energy-intensive industrial and large commercial customer sectors, to encourage more of these customers to participate in the Companies' EE/DSM programs. Finally, the Companies should consider regional collaboration, which would allow electric utilities to share lessons learned with one another concerning targeted offerings. These recommendations are discussed in detail in Section IV.E. of SACE and the Sierra Club's Initial Comments submitted on February 5, 2013.

IV. DEC AND DEP SHOULD INTEGRATE HIGHER LEVELS OF RENEWABLE ENERGY INTO THEIR PLANS.

Both DEC and DEP have a solid track record of complying with the North Carolina Renewable Energy and Energy Efficiency Portfolio Standard ("REPS"). This

experience demonstrates that renewable energy (“RE”) resources are available and can be developed at a reasonable cost, with minimal impact on ratepayers. Yet both the DEC and DEP 2012 resource plans reflect an overly cautious approach to the use of RE to meet system needs over the next 15 years:

Neither DEC nor DEP forecasts renewable energy to become a major element of its energy or capacity strategy over the next 15 years. DEC’s RE strategy is primarily driven by the REPS, as well as an expectation of potential federal or South Carolina legislation. DEC 2012 IRP at 59.⁷ DEP appears to employ a similar strategy, as its current plans for renewable resource deployment are limited to existing renewables contracts for NC REPS compliance. DEP 2012 IRP at 18-19. DEC’s 2012 IRP indicates a modest increase in renewable energy generation, and DEP’s 2012 IRP indicates a slight decrease in renewable energy generation. One reason that DEP’s 2012 IRP forecasts less growth in renewable energy than DEC’s is that DEP lacks a long-term REPS compliance plan. DEP can and should develop a long-term REPS compliance plan.

Both DEC and DEP should give RE resources greater consideration, particularly over the long term, because of their distinct advantages compared to other supply-side resources. For example, RE resources can yield fuel cost savings, hedge against market and regulatory risk factors, promote local economic development, reduce greenhouse gas and conventional pollutant emissions, and save water.⁸ DEC and DEP may be able to procure energy and capacity at a lower cost by investing in conventional generating resources. However, even if RE costs are currently modestly higher than conventional

⁷ DEC made similar statements in its 2009, 2010, and 2011 IRPs.

⁸ See, e.g., McLaren, J., Southeast Regional Clean Energy Policy Analysis, Chapter 5. NREL Technical Report TP-6A20-49192 (revised April 2011). Available at: http://www.nrel.gov/tech_deployment/state_local_activities/pdfs/49192.pdf.

resources, as technology costs continue to fall and renewables become more cost-competitive with conventional supply-side options, the potential value of RE resources beyond their basic energy and capacity contributions justifies deeper analysis of these resources than the utilities conducted for their 2012 IRPs.

There is enough renewable energy resource potential in the Carolinas to support greater deployment of renewables than indicated in either utility's 2012 IRP. For example, La Capra estimated a practical potential of 4,000 MW of onshore wind, biomass, and hydropower resource opportunities in North Carolina, plus an "unlimited" practical potential for solar resources.⁹ Leading utilities have demonstrated that renewables can be integrated into resource portfolios at substantially faster rates than represented in the current DEC and DEP IRPs.

DEC and DEP can and should conduct a more extensive analysis of renewable energy resources. DEC and DEP's IRPs suggest that their renewable resource acquisitions are for the most part driven by current and anticipated statutory requirements. However, neither utility comprehensively evaluates the option of deploying more renewable energy resources than statutorily required. The quantitative analyses performed by DEC and DEP fail to capture the value added by renewable resources, because the option to develop renewable capacity beyond statutory requirements is screened out before the analytical stage at which the value of these attributes would be most evident—the modeling stage in which the cost of candidate portfolios is estimated across a range of possible future scenarios.

⁹ La Capra Associates. North Carolina's Renewable Energy Policy: A Look at REPS Compliance To Date, Resource Options for Future Compliance, and Strategies to Advance Core Objectives (June 2011), at 2.

As a first step to capturing the full value of renewable resources, DEC and DEP should evaluate one or more candidate portfolios that incorporate more renewable energy and capacity than strictly necessary to comply with the REPS. Such an evaluation would put renewables on an equal footing with conventional supply-side resources, given that a candidate portfolio featuring aggressive renewable resource deployment would be evaluated on an equal basis with DEC and DEP's standard gas-focused and nuclear-focused portfolios in the final, scenario-based PVRR analysis. One way to do this would be to test a "High DSM/High Renewables" candidate portfolio across multiple sensitivities, as is currently done for nuclear- and gas-focused candidate portfolios.¹⁰ Evaluation of one or more high renewables candidate portfolios across all sensitivities would highlight the ability of low-risk renewable resources to provide cost stability to utility portfolios across many possible futures. This analytical approach would allow DEC, DEP, the Commission, the Public Staff, and other stakeholders to more fully understand the value renewable resources can offer beyond basic energy and capacity contributions.

¹⁰ The Arizona Public Service Company ("APS") and Tennessee Valley Authority ("TVA") are two noteworthy examples of utilities that evaluate "High Renewables" candidate portfolios as part of their quantitative IRP analysis. APS models a candidate portfolio that includes procurement of significantly more renewable capacity than needed to meet the state's RPS, and both utilities evaluate High Renewables portfolios across multiple future scenarios in order to capture renewable resource benefits beyond energy and capacity contributions. Arizona Public Service Company, 2012 Integrated Resource Plan, March 2012, <http://www.aps.com/files/various/ResourceAlt/2012ResourcePlan.pdf> (High RE descriptions at 4); Tennessee Valley Authority, Integrated Resource Plan: TVA's Environmental & Energy Future, March 2011, http://www.tva.com/environment/reports/irp/pdf/Final_IRP_complete.pdf (High RE descriptions at 99).

V. **THE COMPANIES' REVISED RESERVE MARGINS APPEAR REASONABLE, BUT DEC'S MARGIN MAY STILL BE TOO HIGH IN LIGHT OF ITS TREATMENT OF DEMAND RESPONSE.**

DEC and DEP have adopted revised reserve margins that appear reasonable.

Based on recent reserve margin studies ordered by the Commission, DEC lowered its reserve margin from 17% to 15.5%, and DEP increased its minimum reserve margin from approximately 14% to 14.5%. These new reserve margins appear reasonable when compared to reserve margins used by comparable utilities; for example, using a different method, South Carolina Electric and Gas Company ("SCE&G") has updated its reserve margin to 14%. 2012 SCE&G IRP at 25.¹¹

Although DEC's 15.5% reserve margin appears reasonable on its face, the Company's treatment of demand response raises concerns that DEC may be planning for excessive reserves. In contrast to the DEP study, in which demand response is treated as a load adjustment that does not require its own reserve requirement, the DEC study treats demand response as a resource option with its own reserve requirement, thereby increasing the reserve capacity.¹²

With the exception of the Power Manager (air conditioner) program, DEC should evaluate demand response programs for purposes of calculating reserve requirements as adjustments to net internal demand. This would align DEC with the most straightforward interpretation of North American Electric Reliability Corporation ("NERC") guidance¹³ as well as with the method used by DEP.¹⁴ Using this approach, the reserve margin

¹¹ See South Carolina PSC Docket No. 2012-9-E.

¹² Astrape Consulting, *Duke Energy Carolinas 2012 Generation Reserve Margin Study* (June 2012).

¹³ As defined by NERC, net internal demand includes unrestricted non-coincident peak adjusted for energy efficiency, diversity, stand-by demand, non-member load *and demand response*. NERC, *Reliability Assessment Guidebook*, Version 3.1 (August 2012).

¹⁴ PJM is another example of a utility system that calculates its reserve margin after subtracting energy efficiency and demand response resources. See, e.g., Summer 2012 PJM Reliability Assessment presented

requirement would decrease by 93 MW by 2017 (roughly 15.5% of the demand response programs other than Power Manager). This alone would reduce costs to customers by tens of millions of dollars.

VI. THE IRPS DO NOT REFLECT A RIGOROUS EVALUATION OF THE ECONOMICS OF CONTINUING TO OPERATE AGING, SCRUBBED COAL UNITS.

Both DEC and DEP are in the process of retiring their oldest, dirtiest coal plants. DEC is already taking steps to retire some of the oldest, highly polluting coal units on its system: Buck Steam Station Units 3 and 4 were retired in May 2011, Cliffside Units 1 through 4 were retired in October 2011, and Dan River Units 1 and 2 were retired in April 2012. DEC 2012 IRP at 54. DEC announced on February 1, 2013 that the Company is accelerating the retirement of Buck Units 5 and 6 and Riverbend Units 4-7 from April 1, 2015 to April 1 of this year.¹⁵ According to the Company's IRP, DEC plans to retire all of its remaining coal units that lack modern sulfur dioxide pollution controls (flue gas desulfurization units or "scrubbers") by 2015. DEC 2012 IRP at 55.¹⁶ DEP's 2012 IRP likewise includes retirement of all of its remaining coal units that lack

to Pennsylvania Public Utility Commission (June 7, 2012) at 4-5, available at http://www.puc.state.pa.us/electric/pdf/Reliability/Summer_Reliability_2012-PJM.pdf.

¹⁵ See Duke Energy news release, available at <http://www.duke-energy.com/news/releases/2013020101.asp>

¹⁶ DEC has committed to retire coal-fired generation to resolve recent litigation. The Merger Agreement provides that DEC will retire coal-fired generation as provided by the terms and conditions of a separate settlement agreement that resolved the contested cases challenging the construction and operation permits for DEC Cliffside Unit 6, entered into between DEC and SACE, the Sierra Club, Environmental Defense Fund, National Parks Conservation Association, and the North Carolina Waste Awareness and Reduction Network, Inc. (the "Cliffside Agreement"). Under the terms of the Cliffside Agreement, DEC agreed to retire coal-fired electrical generating units, representing a total of 1667 MW of capacity, according to the following schedule: 1) 198 MW (total capacity of Cliffside Units 1-4) prior to commencing operation of Unit 6; 2) an additional 800 MW of capacity in three stages (350 MW by December 31, 2015, 200 MW by December 31, 2016, and 250 MW by December 31, 2018); and 3) an additional 669 MW by December 31, 2020.

scrubbers: Lee Units 1-3 in September 2012, Cape Fear Units 5 & 6 and Robinson Unit 1 in October 2012, and Sutton Units 1-3 in December 2013.¹⁷ DEP 2012 IRP at B-6.

The retirement of these highly polluting, “unscrubbed” coal units makes clear economic sense in light of increasingly stringent environmental regulations, low natural gas prices and other factors. The factors apply to scrubbed units as well. Scrubbed units face many of the same risks as the unscrubbed units that DEC and DEP are planning to retire—yet neither Company’s 2012 IRP reflects a rigorous evaluation of the economics of continuing to operate scrubbed coal units.

The U.S. Environmental Protection Agency has recently issued, or is poised to issue, several new regulations to protect human health and the environment. Both DEC and DEP recognize that these regulations, among other factors, will affect coal-fired power plants. Continued operation of scrubbed coal-fired units may be uneconomical due to major capital investments and/or increased operating expenses necessary to comply with these regulations. Yet the DEC 2012 IRP does not contain a detailed discussion (beyond a simple recitation) of the risks faced by the Company’s existing scrubbed coal plants, or any discussion of the implications of these risks at specific coal units. Appendix F to DEP’s 2012 IRP discusses in some detail the regulatory risks faced by the Company’s scrubbed coal plants. DEP’s 2012 IRP at F-1—F-7. The IRP only includes cursory references to the implications of these risks on the generating fleet, however.

Compliance with new regulations will require additional pollution controls or other major capital investments, repowering, or retirement. DEC’s and DEP’s IRPs

¹⁷ PEC has also agreed to retire coal-fired generation to resolve recent litigation. With regard to PEC, the Merger Agreement provides that PEC will retire coal-fired EGUs representing a total 1,533 MW(winter)/1,467 MW (summer) of capacity by December 31, 2015.

should reflect and report on each Company's internal evaluation of whether it will be more economical to retire or repower scrubbed coal units, rather than investing significant capital in pollution control equipment and other infrastructure necessary to comply with impending regulations.

VII. DEC'S AND DEP'S IRP DO NOT APPEAR TO EVALUATE FULLY THE RISK OF DELAYS AND COST INCREASES FACED BY NEW NUCLEAR PLANTS.

Both DEC and DEP include new nuclear generation in their 2012 IRPs. The Companies' nuclear plans must be viewed in light of the history of nuclear power plant construction, which is riddled with instances of cost increases, schedule delays, and plant cancellations.

DEC evaluated both a portfolio based on full ownership of the 2,234 MW Lee Nuclear Station, with units online by the summer of 2022 and 2024, and a "regional nuclear" portfolio consisting of 215 MW of nuclear by 2018, 730 MW in 2022 and 2024, and 558 MW in 2028. DEC 2012 IRP at 11, 105. According to DEC, the regional nuclear portfolio is lower cost to customers in the base case and in most scenarios. DEC chose the full nuclear portfolio for the 2012 IRP preferred plan, however, citing the lack of "firm commitments in place at this time for the regional nuclear portfolio." *Id.* at 12, 109.

Although DEP no longer includes a self-build nuclear option in the planning horizon, "Plan A," which DEP selected as its "preferred plan," includes the assumption that the Company will acquire an ownership stake in nuclear units planned by other electric utilities in the region. Under this "regional nuclear" option, DEP explains that "the 2012 IRP assumes that DEP would take a five percent share of SCANA's V.C.

Summer Units [under development in South Carolina] and 20 percent share of DEC's Lee units as represented in their respective 2011 IRPs." DEP 2012 IRP at 5.

Both DEC's preferred "full ownership" portfolio and DEP's preferred "regional nuclear" portfolio are subject to numerous risks and uncertainties. These include the Nuclear Regulatory Commission Combined Construction and Operating License process; the possibility of escalating nuclear construction costs; the lack of recent experience in U.S. nuclear construction; and the possibility of construction delays. In setting the nuclear capital cost sensitivity range for quantitative analysis, both DEC and DEP should give further consideration to the historical context of nuclear construction in the U.S. as well as the inconclusiveness of current U.S. nuclear projects regarding total cost outcomes. Given the significant uncertainties associated with nuclear construction, DEC and DEP should adopt broader, more conservative sensitivity ranges as DEC's and SCANA's nuclear development plans unfold.

VIII. DEP AND DEC SHOULD EVALUATE THE MACROECONOMIC IMPACTS OF THEIR RESOURCE PORTFOLIOS.

To assess the broader economic consequences of an IRP, it is important to examine the macroeconomic impact of the resource portfolio, such as the impact on jobs and the regional economy. DEC states that its resource planning approach includes both quantitative analyses and qualitative considerations, such as "regional economic development considerations." DEC 2012 IRP at 7. However, its IRP does not include any discussion of the impact of its plan on the regional economy or employment, or any analysis to quantify this impact.¹⁸ DEP's IRP is also devoid of any such discussion.

¹⁸ DEC does discuss the economic impact of lower natural gas prices on its plan. DEC 2012 IRP at 10.

Both DEC and DEP should consider including such an analysis as part of the resource planning process.

Quantitative analyses may be used to estimate the impacts of resource planning decisions and energy policies on macroeconomic indicators such as employment, disposable income, and government revenue. Such analyses would help North Carolina's utilities leverage their resource investments to spur job creation and economic development, while keeping electric rates as low and stable as possible. With this information in hand, the Commission, customers, and interested parties would be in a better position to understand the economic consequences of the various alternative plans analyzed in the IRPs.

IX. THE COMPANIES' RESPONSES TO PUBLIC WITNESS TESTIMONY.

Public witness testimony at the February 11, 2013 and February 28, 2013 public hearings in this docket was overwhelmingly in favor of increased reliance on energy efficiency and renewable generation options for meeting the energy needs of ratepayers in North Carolina. As the Commission observed in its May 3, 2013 Order Requiring Verified Responses, "many citizens questioned whether the IRPs filed by [DEC] and [DEP] appropriately reflect the expected growth in demand for electricity, the ability to meet that demand with energy efficiency and renewable energy resources, and other aspects of the Companies' IRPs." In light of the concerns expressed by public witnesses and commenters, the Commission appropriately ordered the Companies to file verified responses to a number of questions.

The Companies filed their verified responses on June 20, 2013 ("Companies' Responses"). SACE and the Sierra Club submit the following regarding certain of the responses:

The Companies' response to Question No. 4, regarding the future of solar-powered electric generation in North Carolina, states that the Companies are currently initiating a "comprehensive study seeking to identify and, where possible, quantify future potential benefits and costs of solar generation across the entire generation, transmission and distribution systems," and that these study results would be incorporated into the resource planning and avoided cost processes. Companies' Responses at 6. This study will have important implications for ratepayers and the future of solar electric generation in North Carolina. SACE and the Sierra Club therefore respectfully request that the Commission require the Companies to file the completed study with the Commission in the appropriate IRP and avoided cost dockets and explain how the results were incorporated into their IRPs and their proposed avoided costs.

With regard to Question No. 5, which asked the Companies to respond to public witness comments about contamination of Mountain Island Lake from coal ash impoundments at DEC's Riverbend Steam Station, DEC asserts, among other things, that "the lake's water quality remains good, fish are healthy and drinking water supplies are safe"; that Riverbend "has been in compliance with both state and federal air and water quality regulations that are included in the permits issued to the plant"; and that "[g]roundwater sampling at Riverbend's ash basins finds elevated levels of iron and manganese only, both of which are common to North Carolina soils and pose no health risk to drinking water." Companies' Responses at 7-8.

DEC stores millions of tons of wet coal ash in unlined lagoons on the banks of Mountain Island Lake, separated from the lake only by leaking earthen berms. The State of North Carolina has set out in a verified complaint that DEC is violating both state law

and its National Pollutant Discharge Elimination System permit by discharging pollutants from its unlined, leaking Riverbend coal ash lagoons into the Charlotte region's drinking water supply. North Carolina has stated under oath that DEC's illegal pollution represents a serious threat to the public health and natural resources of the state. DEC illegally discharges hundreds of thousands of gallons of contaminated water from the Riverbend coal ash lagoons each year. Testing has revealed that these illegal discharges contain high levels of arsenic and cobalt and other pollutants such as strontium, barium, iron, manganese, and zinc. Moreover, a Duke University study has found that DEC's coal ash pollution, including arsenic, has contaminated the sediments of Mountain Island Lake and that when conditions are right, these pollutants erupt into the Lake's waters.

DEC has negotiated a proposed settlement with DENR that would leave the ash in place and not require DEC to stop polluting or to clean up the existing contamination. The citizens concerned about DEC's coal ash pollution of the drinking water supply reservoir for the entire Charlotte region, referred to in Question No. 5, were echoed by almost 5,000 citizens who wrote to the Department of Environment and Natural Resources regarding the proposed settlement. Virtually all the commenters opposed the settlement, demanded a public hearing, and asked the state to require DEC to remove the coal ash from the banks of Mt. Island Lake and clean up the contamination. Former Duke Energy CEO Jim Rogers has acknowledged, referring to the Riverbend coal ash ponds, that "We'll ultimately end up cleaning up all that."¹⁹ Although the question of cost recovery for any cleanup or remediation of the Companies' coal ash lagoons and associated groundwater contamination is unclear, the potential costs and risks to

¹⁹ "Jim Rogers' Closing Act," *Charlotte Magazine* (May 2013), available at <http://www.charlottemagazine.com/Charlotte-Magazine/May-2013/Jim-Rogers-Duke-Energy-Closing-Act/index.php?cparticle=1&siarticle=0#artanc>.

customers of continuing to operate these facilities should be factored into the Companies' resource planning decisions.

Question No. 18 asked the Companies to address public witness testimony regarding the threat of climate change and the need for the Commission to order steps in this proceeding to accomplish a transition from fossil-fueled and nuclear generation to renewables, demand response, and energy efficiency. The Companies' response notes that "the debate [regarding regulation to address global climate change] continues at the state and federal level, but with no approved legislation/regulations or expected timing of legislation/regulations." Companies' Responses at 18. Since the date on which the Companies filed their Responses, President Obama, on June 25, 2013, issued a memorandum directing the Environmental Protection Agency to issue final carbon pollution standards, regulations, or guidelines for existing power plants by no later than June 15, 2015.²⁰ DEC and DEP should factor this timeline for carbon regulation into their IRPs. In addition, as discussed in Sections III. and IV., above, DEC and PEC should fully evaluate the potential for energy efficiency and renewables to mitigate the risks and costs associated with impending carbon regulation.

X. WORKGROUP RECOMMENDATION

SACE and the Sierra Club recommend that the Commission convene a workshop on issues arising from the 2012 IRPs. Such a workshop could provide an opportunity for the electric utilities to present their IRPs, and for intervenors to present their analysis of those IRPs, to the Commission, and for the Commission to question the parties' representatives on the issues it identifies, without the need for formal witness testimony.

²⁰ Presidential Memorandum -- Power Sector Carbon Pollution Standards (June 25, 2013), available at <http://www.whitehouse.gov/the-press-office/2013/06/25/presidential-memorandum-power-sector-carbon-pollution-standards>.

In addition, or in the alternative, the Commission should consider establishing a collaborative working group to discuss and report on certain issues related to the IRPs and the resource planning process. In its IRP, DEP states that, in light of the Duke-Progress merger, DEC and DEP intend to “standardize data inputs and models for use in their individual IRP filings” and that “[a]s more coordinated planning occurs over time, future IRPs will reflect the effects of coordinated assumptions and analytic approaches between DEC and PEC.” DEP 2012 IRP at 3. The fact that the Companies are in the process of harmonizing their resource planning practices presents a critical opportunity to seek input from stakeholders on assumptions, analytic approaches, and best practices in resource planning. DEC’s Carolinas Energy Efficiency Collaborative (“Collaborative”) provides a ready model for such a collaborative working group. As DEC witness Timothy J. Duff recently testified in Docket No. E-7, Sub 1032, “the Collaborative has proven an effective way to gain stakeholder support and eliminate opposition to filings.” Settlement Support Testimony of Timothy J. Duff, Docket No. E-7, Sub 1032 (filed Aug. 19, 2013) at 17. SACE and the Sierra Club respectfully suggest that such a workgroup would be more effective if it continued to meet after the conclusion of the present docket, so that the workgroup’s suggestions and recommendations could inform the utilities’ development of future IRPs. To enable the full participation of the Public Staff, the Commission may wish to engage a third-party facilitator if it decides to convene such a workgroup.

XI. RELIEF REQUESTED

In light of the foregoing, SACE and the Sierra Club respectfully request that the Commission take the following actions:

1. Direct DEC and DEP to model energy efficiency on an equivalent basis to supply-side resources; for example, by adopting a two-supply-curve approach.
2. Direct DEC to distinguish between demand response programs that require backstand reserves and those that do not in its reserve margin analysis, and to apply its findings to its reserve margin calculation.
3. Direct DEC and DEP to analyze the economics of the retirement versus continued operation of each existing coal unit that each Company is not currently planning to retire, and to present the results of this analysis in the 2013 IRPs.
4. Direct DEC and DEP to evaluate future investments in renewable energy resources beyond the minimum REPS requirements in comparison to “conventional” resource options and analyze the potential ancillary benefits or costs of integrating significant levels of on-system renewable energy resources.
5. Direct DEC and DEP to conduct sensitivity analyses for future renewable technologies to demonstrate the maximum cost levels that would be reasonable for initial levels of resource development and identify any cost-effective technologies.
6. Direct DEC and DEP to conduct a more complete evaluation of the risks of construction delays and cost increases associated with new nuclear generation, using robust assumptions.
7. Direct DEC and DEP to provide information concerning the economic impacts of their resource planning decisions on a trial basis in the 2013 IRPs.
8. Consider convening a workshop and/or establishing an IRP working group to provide input on the development of future IRPs.

Respectfully submitted this 6th day of September, 2013.


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CERTIFICATE OF SERVICE

I hereby certify that the persons on the service list have been served with the Brief of Southern Alliance for Clean Energy and the Sierra Club either by electronic mail or by deposit in the U.S. Mail, postage prepaid.

This the 6th day of September, 2013.

Robin G. Dunn
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