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June 11, 2010

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Clerk's Office
N.C. Utilities Commission

VIA HAND DELIVERY

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

OFFICIAL COPY

RE: Investigation of Integrated Resource Planning in North Carolina - 2009
Docket No. E-100, Sub 124

Dear Ms. Vance:

Enclosed please find for filing in the above-captioned matter an original and thirty (30) copies of the Brief of the Environmental Defense Fund, Southern Alliance for Clean Energy and the Sierra Club. By copy of this letter, I am serving all parties of record.

Sincerely,


Gudrun Thompson

Enclosures

cc: Parties of Record

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disk to Portia

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-100, Sub 124

FILED

JUN 11 2010

Clerk's Office
N.C. Utilities Commission

In the Matter of:

Investigation of Integrated Resource
Planning in North Carolina -- 2009

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) ENVIRONMENTAL INTERVENORS'
) POST-HEARING BRIEF
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)

Pursuant to North Carolina Utilities Commission Rule R1-25 and the Commission's May 13, 2010 Order Granting Extension of Time, Environmental Defense Fund, the Sierra Club, Southern Alliance for Clean Energy, and the Southern Environmental Law Center (collectively, "Environmental Intervenors"), respectfully submit this brief to the Commission on certain issues in this docket.

INTRODUCTION

Duke Energy Carolinas ("Duke") and Progress Energy Carolinas ("Progress" or "PEC") (the two utilities on whose IRPs the Environmental Intervenors have focused on in this docket) have filed their 2008 IRPs, as well as 2009 updates to their IRPs, with the Commission for its approval. The narrow legal issues before the Commission with respect to the IRPs are whether the utilities are employing the use of the "entire spectrum of demand-side options" in their resource planning and whether the IRPs result in the least cost mix of demand- and supply-side resources. In addition, Environmental Intervenors respectfully submit that the larger policy issue before the Commission is whether the utilities' IRPs reflect the rapidly changing regulatory environment and an evolving power marketplace, in which energy efficiency, natural gas and renewable energy sources are beginning to displace coal-fired power plants.

This Commission and the legislature of North Carolina have taken several steps to move utilities operating in North Carolina toward a cost-effective, cleaner energy future. Unfortunately, the 2008 and 2009 IRPs demonstrate a lingering tendency by the utilities to conduct business as usual, by underestimating the amount of demand-side management and energy efficiency¹ ("EE") that can be achieved, by continuing to underutilize renewable supply-side resources, and by over-relying on old-style, polluting, increasingly expensive coal-fired power plants to power our State.

The Duke and PEC IRPs do not result in the least-cost mix of generation resources available, in contravention of North Carolina law. The Duke and PEC IRPs violate both the letter and spirit of our State's policy requiring use of the "entire spectrum of demand-side options" in least-cost resource planning, and fail to meet the requirement of our legislature's mandate to implement demand-side management and energy efficiency measures and use supply-side resources to establish the least cost mix of demand reduction and generation measures. Further, the Duke and PEC IRPs fail to comply with the *de minimis* requirements outlined in the Commission's Rules, including the requirements to include in the IRP an assessment of demand-side management and energy efficiency and an analysis of environmental impact and the cost of complying with current and future environmental regulations. In addition, the IRPs betray a continued over-reliance on nonrenewable supply-side options, in particular pulverized coal-fired power plants, to the detriment of demand-side management ("DSM") measures and particularly energy efficiency options. As a

¹ References in this brief to "demand-side management" measures include energy conservation among those measures.

result, despite the increased emphasis on demand-side management/energy efficiency and renewable energy generation in the North Carolina General Statutes and this Commission's rules, the plans reveal that the utilities are continuing their business-as-usual coal-heavy approach to power generation.

Public witness testimony at the March 15, 2010 public hearing 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. In addition, expert testimony presented by Environmental Intervenors and others at the March 16-18, 2010 evidentiary hearing provided a reasoned, substantiated, and compelling basis for this Commission to require a much greater commitment to demand-side management, energy efficiency, and renewable supply-side resources from Duke and PEC, more careful and accurate scrutiny of the future costs of coal-fired generation, including the cost of carbon dioxide and other regulations, as well as a more accurate assessment of the updated price of natural gas, which can be part of a lower-cost, cleaner energy future.

LEGAL FRAMEWORK FOR RESOURCE PLANNING

The Commission's review of the electric utilities' resource plans is guided by several General Statutes and Commission rules. The overarching purpose of the integrated resource planning process is set out in the Public Utilities Act, which directs the Commission to "develop, publicize, and keep current an analysis of the long-range needs for expansion of facilities for the generation of electricity in North Carolina . . . and [to] consider such analysis in acting upon any petition by any utility

for construction.” N.C. Gen. Stat. § 62-110.1(c). The Commission’s review of the utilities’ resource plans should be consistent with our State’s policy

To assure that resources necessary to meet future growth through the provision of adequate, reliable utility service include use of *the entire spectrum of demand-side options, including but not limited to conservation, load management and efficiency programs*, as additional sources of energy supply and/or energy demand reductions. To that end, *to require energy planning and fixing of rates in a manner to result in the least cost mix of generation and demand-reduction measures which is achievable*, including consideration of appropriate rewards to utilities for efficiency and conservation which decrease utility bills

N.C. Gen. Stat. § 62-2(a)(3a) (emphasis added). In setting this policy, the legislature drew a clear connection between energy efficiency, conservation and other demand-side management measures, and provision of least-cost power to the State’s ratepayers.

In 2007, the North Carolina legislature went far further, enacting legislation that emphasizes demand-side management and renewable energy generation as key components of utility planning in our State. First, N.C. Gen. Stat. § 62-2 was amended to include among the stated policies of the State of North Carolina:

- To promote the development of renewable energy and energy efficiency through the implementation of a Renewable Energy and Energy Efficiency Portfolio Standard (REPS) that will do all of the following:
- a. Diversify the resources used to reliably meet the energy needs of consumers in the State.
 - b. Provide greater energy security through the use of indigenous energy resources available within the State.
 - c. Encourage private investment in renewable energy and energy efficiency.
 - d. Provide improved air quality and other benefits to energy consumers and citizens of the State.

N.C. Gen. Stat. § 62-2(10) a.-d. Second, the General Assembly enacted N.C. Gen. Stat. § 62-133.8, which requires electric utilities in the state of North Carolina to meet

a Renewable Energy and Energy Efficiency Portfolio Standard ("REPS Standard"), defined as an increasing percentage of retail sales within the State as measured in three-year increments beginning in the year 2012. Third, the General Assembly enacted N.C. Gen. Stat. § 62-133.9, which requires that each electric power supplier "implement demand-side management and energy efficiency measures and use supply-side resources to establish the least cost mix of demand reduction and generation measures that meet the electricity needs of its customers." Each electric power supplier must also "include an assessment of demand-side management and energy efficiency in its resource plans submitted to the Commission and shall submit cost-effective demand-side management and energy efficiency options that require incentives to the Commission for approval." N.C. Gen. Stat. § 62-133.9(b) & (c). The statute further authorizes the Commission to approve an annual rider to the supplier's utility rates to recover reasonable and prudent capital costs for adoption and implementation of new demand-side management and energy efficiency measures. *Id.* at (c).

The Commission's rules now implement this ground-breaking legislation. NCUC Rule R86-67 implements the REPS standard, NCUC Rule R8-68 establishes guidelines for incentive programs offered by utilities (including energy efficiency and demand-side management programs), and NCUC Rule R8-69 provides details on cost recovery for demand-side management and energy efficiency measures.

The Commission's rule governing the IRP process requires each electric utility to develop an integrated resource plan ("Resource Plan" or "IRP") incorporating "a 15-year forecast" of loads and generating capacity. NCUC Rule R8-

60(c). Commission Rule R8-60 also contains extensive provisions that reflect the increased focus on energy efficiency and renewable energy generation. The rule requires each utility to include an assessment of demand-side management and energy efficiency in the IRP. In addition, the rule requires that each utility's consideration of supply-side and demand-side resources appropriately consider and incorporate the utility's obligation to comply with the REPS standard. NCUC Rule R8-60(c). Further, the rule requires each utility to assess on an on-going basis potential benefits of reasonably available alternative supply-side energy resource options as part of the IRP process. *Id.* at (e). Under the rule, alternative supply-side energy resources include, but are not limited to, hydropower, wind, geothermal, solar thermal, solar photovoltaic, municipal solid waste, fuel cells, and biomass. *Id.* Additionally, the rule requires each utility to assess on an on-going basis programs to promote demand-side management, including costs, benefits, risks, uncertainties, reliability, and customer acceptance. *Id.* at (f). Under the rule, demand-side management consists of demand response programs and energy efficiency and conservation programs. *Id.* Further, the rule requires each utility to analyze potential resource options presented in its IRP in specific ways. One important part of the utility's analysis concerns environmental impact and the cost of complying with current and future environmental regulation:

The utility must take into account the sensitivity of its analysis to variations in future estimates of peak load, energy requirements, and other significant assumptions, including, but not limited to, the risks associated with wholesale markets, fuel costs, construction/ implementation costs, transmission and distribution costs, and ***costs of complying with environmental regulation.*** Additionally, the utility's analysis should take into account as applicable, system operations, ***environmental impacts***, and other qualitative factors.

NCUC Rule R8-60(g) (emphasis added).

The Commission has recognized that “the General Assembly and the Commission have placed increased emphasis on the importance of energy efficiency, conservation, and demand side management as a solution for the challenges resulting from higher fuel and other input prices, increasing demand and the potential need for the construction of new generating facilities.” Order Ruling on Fixed Payment Programs, Docket E-7, Sub 710 (Mar. 14, 2008). With the 2007 legislative changes, the new Commission rules implementing the legislation, and the current emphasis by the Commission and the North Carolina General Assembly on energy efficiency, renewable energy sources, and evaluation of environmental impact and cost of environmental controls, the legal and policy backdrop for IRP proceedings has changed profoundly in the State of North Carolina. As a result, this Commission’s review and analysis of the 2009 IRPs in this docket must reflect this changed legal and policy landscape. Unfortunately, the IRPs presented in this docket do not reflect this new landscape, but instead evidence a business-as-usual approach by utilities operating in North Carolina, with the usual coal-heavy resource mix, and inadequate consideration given to other, cleaner energy approaches that could supply North Carolina ratepayers with lower-cost power over the long-term.

**THE DUKE AND PROGRESS IRPS
FAIL TO IDENTIFY A LEAST-COST RESOURCE MIX**

**I. The IRPs Contain Numerous Deficiencies Resulting in Insufficient
Incorporation of Demand-Side Resources**

A. Introduction

North Carolina's electric utilities are offering substantial energy efficiency programs for the first time. John D. Wilson Summary of Testimony, Tr. Vol. 3, p. 122. With the emergence of these large-scale programs, "North Carolina is stepping forward as the energy efficiency leader in the Southeast. Nevertheless, energy efficiency remains confined to a second-class status in the utility resource plans." Wilson Summary, Tr. Vol. 3, p. 123. North Carolina trails far behind the top-performing states in the nation on efficiency; according to the American Council for an Energy-Efficient Economy ("ACEEE"), North Carolina's annual energy savings due to energy efficiency programs in 2007 were 40th in the country. Tr. Vol. 3, p. 90. The new energy efficiency programs being implemented across North Carolina should drive up the State's future rankings; nevertheless, the state's forecast of energy savings of 0.3% per year over the next decade is the lowest of the 24 states with established targets or mandates. Wilson Exhibit 8. North Carolina's electric utilities can and should do more to help their customers reap the benefits of energy efficiency.

B. Energy Efficiency Should Be the "First Fuel"

Energy efficiency is good for both ratepayers and the environment. According to the National Action Plan for Energy Efficiency, the benefits of energy efficiency include environmental quality improvements, energy market price reductions, lower portfolio risk, economic development, and assistance to low-income populations. Direct Testimony of John D. Wilson ("Wilson Direct"), Tr. Vol. 3, p. 88. Energy efficiency programs can also reduce customer bills—even though rates may increase. Wilson Direct, Tr. Vol. 3, p. 90. Energy efficiency programs result in the

customer using less energy, with the result that the total cost to a customer to meet all his or her power need actually *decreases*. *Id.* Thus, cost to the customer is the metric that matters in this analysis.

Not only is energy efficiency the cleanest resource, it is also the cheapest resource available to utility resource planners. Utility-led energy efficiency programs are the least-cost energy resource from a system perspective. *Wilson Direct*, Tr. Vol. 3, p. 88. As Public Staff Witness Floyd put it, “We do understand that [energy efficiency] is the cheapest resource.” Tr. Vol. 3, p. 35.

Given the benefits of energy efficiency, it should be the “first fuel” that utility resource planners look to in developing their resource portfolios. The Duke and PEC resource plans, however, fail to consider energy efficiency and other demand-side resources on an equivalent basis to supply-side resource options. As a result, the Duke and PEC IRPs do not result in the “least-cost mix of resource options,” as required by N.C. Gen. Stat. § 62-2(3)(a).

C. The Duke and PEC IRPs Do Not Reflect the Entire Spectrum of Demand-Side Options

The Duke and PEC IRPs fail to consider potential demand-side resource options on an equivalent basis to supply-side resource options, for different reasons. First, Duke did not provide an adequate and accurate forecast of demand-side program impacts, whereas PEC’s forecast was unreasonably low. As a result, both IRPs are skewed toward supply-side options. Second, neither utility performed a comprehensive analysis of demand-side resources, and those analyses that were performed were either not disclosed or were inadequately discussed in the IRPs. Third, Duke did not explain how it selected its preferred efficiency portfolio. Finally,

PEC did not model energy efficiency resources on an equal footing with supply-side resources. As a result of these shortcomings, discussed in further detail below, the Duke and PEC IRPs do not adequately reflect the entire spectrum of demand-side options, as required by North Carolina law.

1. Duke did not provide an adequate and accurate forecast of demand-side program impacts.

In general, Duke's demand-side resource forecast "demonstrates [the company's] commitment to ramp up its energy efficiency offerings in the Carolinas to levels that will make it a leader in the industry." Wilson Direct, Tr. Vol. 3, p. 98. However, the Duke forecast suffers from an inadequately explained, uneven pattern of incremental impacts from its energy efficiency programs, which diminishes the long-term resource potential of Duke's energy efficiency programs for planning purposes. The "lumpiness" of Duke's forecast appears to be an artifact of the way Duke modeled its energy efficiency programs. Duke modeled its energy efficiency programs in three four-year "bundles." Direct Testimony of Richard Stevie, Tr. Vol. 2, p. 29. Duke assumed that the level of impacts would remain the same in the last three years of the planning horizon, and that Duke would not add any more "bundles." Tr. Vol. 2, p. 29.

The "bundle" approach "understates the likely impact of [Duke's] energy efficiency programs." Wilson Direct, Tr. Vol. 3, p. 99. Public Staff witness Floyd testified that Duke's bundle approach was "a very static approach." Tr. Vol. 3, pp. 42-43. As Mr. Wilson explained, "there is no reason to believe that program performance will suddenly drop off and then pick back up on a four-year cycle." Tr. Vol. 3, p. 100. Mr. Wilson recommended that Duke revise its resource plan to reflect

a consistent trend in energy efficiency program growth, based on available energy efficiency potential and opportunities for reasonable program growth. Tr. Vol. 3, p. 101.

2. PEC's forecast of demand-side program impacts is unreasonably low.

PEC projects cumulative energy efficiency savings impacts of only 3.8% of retail sales by 2024, Tr. Vol. 1, p. 114, based on the identified cost-effective energy efficiency, Tr. Vol. 1, p. 117. This number is unreasonably low. Public Staff witness Floyd testified that he thought PEC could do better than 3.8% by 2024. Tr. Vol. 3, p. 35. In fact, Duke projects under its base case that its cumulative energy efficiency savings will amount to 4.5 percent by 2020, Tr. Vol. 2, p. 31, and estimates savings under its cost-effective high case of 13.5% of retail sales by 2029. Tr. Vol. 2, p. 32. PEC has failed to justify why its projections for energy efficiency savings are so much lower than those calculated by Environmental Intervenors' experts, those expected by the Public Staff, and those that Duke, the other leading investor owned utility in the State, projects it can achieve. Environmental Intervenors witness Wilson testified that considering the goals and demonstrated energy savings of utilities around the country, PEC should consider energy efficiency savings impacts of up to 15% by 2024.

3. Neither Duke nor PEC included in its IRP a comprehensive evaluation of DSM/EE resources.

Commission rules and prior orders of the Commission require the Duke and PEC IRPs to include a comprehensive assessment of DSM and EE resource options. In its order approving the 2007 IRPs, the Commission directed the investor-owned-

utilities to include a section in their IRPs containing a comprehensive analysis of their DSM plans and activities, including relevant cost-benefit information. Order Approving Integrated Resource Plans, Docket No. E-100, Sub 109 (July 7, 2009). N.C. Gen. Stat. 62-133.9(c) codified this requirement, providing that the electric utilities shall include an assessment of DSM and EE in their resource plans. Commission Rule R8-60 provides additional detail that must be included in these assessments. Despite these clear requirements, neither Duke nor PEC included a comprehensive evaluation of DSM/EE resources in its resource plan.

The evaluation of EE resources in Duke's IRP was not comprehensive because the Company's market potential study, on which it was based, failed to examine all cost-effective energy efficiency measures and programs. Duke Witness Stevie testified that the efficiency "high case" in its IRP was based on the economic potential from a 2007 market potential study performed for Duke by Forefront Economics Inc. The Forefront market potential study was not comprehensive, however, as evidenced by the fact that three substantial measures or practices were omitted from the study: a Home Energy Comparison Report program, a building re/retro/commissioning program, and various energy recycling technologies, including combined heat and power. Tr. Vol. 3, p. 111. Those programs also were not included in Duke's resource planning process, demonstrating that neither the Forefront study nor the assessment in Duke's IRP was "comprehensive." Tr. Vol. 3, pp. 175-76. When asked about several new programs that Duke is developing, Mr. Wilson observed that the fact that these new programs were not included in the Forefront market potential study, "that is a perfect example of why that potential

study can't be relied upon" Tr. Vol. 3, p. 175. Moreover, the 2007 Forefront study is out of date, and cannot be considered comprehensive given the advancements in efficiency technology, codes and standards, and program design since 2007. Dr. Stevie acknowledged that the study "suffers from the same issue" as other pre-2007 studies in that it predates the federal Energy Independence and Security Act, which set new standards for lighting and other end-uses. Tr. Vol. 4, p. 31.

PEC's IRP likewise did not include a comprehensive evaluation of demand-side options. PEC did not explain its analysis of demand-side resource options, as required by NCUC Rule R8-60. In fact, PEC's IRP entirely failed even to disclose the existence of the market potential study performed for the Company by ICF International. As noted previously, NCUC Rule R8-60(i)(6) requires each utility to provide 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. PEC did not provide a description or the results of the ICF study in its 2009 IRP, in violation of Rule R8-60(i)(6)—even though PEC Witness Edge acknowledged that the ICF study is relevant to the assessment of EE and DSM conducted for purposes of the IRP.² Tr. Vol. 5, pp. 67-68.

PEC's IRP also did not include the detailed information about each of the utility's existing and planned EE/DSM programs required by NCUC Rule R8-

² Even if PEC had disclosed and discussed the ICF study in its IRP, it still would not have complied with Rule R8-60(i)(6) because the ICF study itself was not comprehensive. Several measures were not evaluated in PEC's potential study, including a window air conditioner program, water heater blankets, and low-flow showerheads. Tr. Vol. 3, p. 156. As Mr. Wilson pointed out, "if you say it's comprehensive and there's holes in it, then it's not comprehensive." Tr. Vol. 3, p. 158.

60(i)(6), including available or projected capacity and energy, and number of customers or projected customers. Mr. Edge testified that certain of this information was provided in an aggregated form in Appendix E to the PEC IRP, but conceded that it was not broken out by program or measure. Tr. Vol. 5, pp. 69-70. In the form submitted, this information is unintelligible; thus PEC's IRP fails to meet the requirements of Commission Rule R8-60(i)(6).

4. Duke did not explain how it selected its preferred energy efficiency resource scenario.

Duke selected its "base case" demand-side resource portfolio for inclusion in its IRP, even though the high energy efficiency scenario was also determined to be considered cost-effective. However, Duke did not articulate a convincing rationale for choosing the "base case" over the "high case" energy efficiency scenario. Thus, Duke's IRP will achieve less energy efficiency than it could according to Duke's own calculations, on an apparently arbitrary basis.

Duke prepared both a "base case" and a "high case" energy efficiency scenario. Tr. Vol. 2, p. 23. Dr. Stevie testified that the base case was based on Duke's modified Save-a-Watt programs. Tr. Vol. 2, pp. 28-29. The program impacts were scaled up to be consistent with the projected impacts in the Save-a-Watt settlement agreement, but for some unexplained reason Duke assumed it only achieved 85 percent of projected impacts. Tr. Vol. 2, pp. 29-30. Under the base case, Duke projected cumulative energy savings of 4.5 percent by 2020. Tr. Vol. 2, p. 30. Dr. Stevie explained that the high case was the same as the base case for the first five years, and thereafter Duke assumed a level of impact of 1 percent of retail sales each

year until the economic potential is reached. Tr. Vol. 2, p. 31. Under the high case, the program impacts reached 13.5% of retail sales by 2029. Tr. Vol. 2, p. 32.

Dr. Stevie explained that Duke modeled a resource option with the base case, and then modeled a resource option with the high case, and “it was selected in both cases.” Tr. Vol. 2, p. 23. According to the testimony of Duke Witness McMurry, the base case was cost-effective at the screening stage and thus was included in all portfolios. Tr. Vol. 1, p. 192. The high case was also cost-effective. Id. However, Duke selected the base case, rather than the high case, for inclusion in its overall IRP resource portfolio. Duke did not explain this decision in the IRP, and Duke witnesses were unable to articulate a convincing rationale for this decision in testimony. When asked about the decision, Mr. McMurry expressed “uncertainty” as to whether an investment in DSM/EE will be treated the same as an investment in a generating plant. Direct p. 9. But Mr. McMurry acknowledged that North Carolina statutes allow for recovery of lost revenues and an incentive for new DSM and EE investments, and that the Commission had recently approved Duke’s modified Save-a-Watt approach to compensation for DSM/EE measures. Tr. Vol. 2, pp. 20-21.

5. PEC did not model energy efficiency resources on an equal footing with supply-side resources.

PEC’s approach to modeling EE/DSM resources placed those resources on an inferior footing as compared with supply-side resources. Among the best practices recommended in a Lawrence Berkeley National Laboratory report are that utilities should construct candidate portfolios with the maximum achievable EE potential and use a transparent process for selecting the preferred portfolio. Wilson Direct, Tr. Vol. 3, p. 119. Mr. Wilson testified that when he reviews materials in other parts of the

country, utilities present efficiency programs as “generic” resources, similar to the way they include generic supply-side resources in their IRPs. Tr. Vol. 3, p. 153.

Unlike Duke, PEC did not model EE or DSM options as part of a resource portfolio. As Mr. Snider explained, “The way we model it is to first identify all cost-effective DSM and EE and then reduce our demand and energy forecast to net out the implementation of cost-effective DSM and EE.” Tr. Vol. 1, p. 132. In other words, the EE and DSM programs were incorporated into the load forecast for system peak load and total energy, but they were not actually modeled as a resource option at the screening stage or in the development of portfolios. Tr. Vol. 1, pp. 133-134. PEC did not conduct any sensitivity analyses on the load forecasts based on changes to assumptions about the level of EE or DSM resources in the IRP—i.e., PEC did not run sensitivities for low, medium or high levels of efficiency. Tr. Vol. 1, p. 136. Moreover, PEC has not determined whether it plans to correct this error by running sensitivities for several EE cases for purposes of the 2010 IRP. Tr. Vol. 1, p. 136.

II. The IRPs Underestimate the Risks and Costs of Coal-Fired Generation While Overestimating the Costs of Alternative Supply-Side Resources

In addition to the Duke and PEC IRPs’ shortcomings with respect to demand-side resources, the IRPs do not identify a least-cost resource mix because they underestimate the future costs of operating coal-fired power plants, while overestimating the future costs of natural gas and other resource options. Both the Duke and PEC IRPs fail to adequately factor in the likely future costs of federal carbon dioxide regulation and fail to include accurate assumptions about other imminent environmental compliance costs of coal-fired generation.

By underestimating or ignoring the likely future costs of regulation, both Duke and PEC are maintaining an overreliance on highly polluting coal-fired generation. As a result, both utilities run a serious risk of ending up “behind the curve” as operating coal plants becomes more and more expensive due to tighter regulations. Without better planning, Duke’s and PEC’s ratepayers could soon find themselves financially burdened by a fleet heavy with increasingly expensive coal-fired units, and therefore unable to provide low-cost, low-risk energy. Infirmities in each of the utilities’ IRPs are detailed below.

A. The Duke and Progress IRPs Underestimate the Risk and Cost of Carbon Dioxide Regulation

Duke Energy has been a very public proponent of carbon legislation, and the company recognizes that carbon dioxide controls are imminent. However, far from showing real efforts to control its future carbon dioxide emissions, Duke’s IRP actually reflects an *increase* in carbon dioxide emissions in each of its resource portfolios over the years 2010 to 2019.

Environmental Intervenor witness Schlissel established this upward trend in his direct testimony, Tr. Vol. 2, pp. 165-6, and Duke witness McMurry confirmed it, Tr. Vol. 4, pp. 125-6. While Mr. McMurry attempted to rationalize this increase by arguing that Duke’s carbon dioxide emissions *rates* do not increase over the same time, *id.* at 126, in fact Duke does not deny that its *total* carbon dioxide emissions do increase. Environmental Intervenor witness Schlissel concluded that the increase can be traced chiefly to the construction of Cliffside Unit 6, which will emit approximately 6 million tons of carbon dioxide each year, or more than 2 million tons more carbon dioxide than was emitted in 2008 by all of the cycling coal units that

Duke plans to retire. Tr. Vol. 2, p. 166. Duke witness McMurry attempted to ascribe the increase in part to the inclusion of a total of 1,800 megawatts of additional wholesale load. Mr. McMurry confirmed that up to 1,000 of the megawatts of wholesale load would be attributable to a power purchase agreement with the Central Electric Power Co-operative in South Carolina. Tr. Vol. 4, p. 131. However, on cross-examination, Mr. McMurry conceded that Duke has not done any analysis of the current carbon emissions associated with that portion of the wholesale load. *Id.* at 132. Nevertheless, Duke baselessly claims that importing those wholesale customers over to the Duke system is responsible for the future increase in carbon dioxide emissions from the Duke system.

Duke's IRP seems to indicate that the company's plan for addressing its increased carbon dioxide emissions is limited to purchasing emissions allowances for the increased emissions. However, on cross examination Duke witness McMurry admitted that Duke has conducted "confidential" analyses of how to reduce its carbon dioxide emissions, although those analyses were not submitted in this, or any other, docket to this Commission for review. Tr. Vol. 4, p. 133. In fact, Environmental Intervenors were only able to obtain a copy of these analyses through a data request. *Id.*, pp. 133-7. It seems that the internal planning at Duke is far more realistic and practical about the impact on its business from carbon dioxide regulation than is the simplistic, selective narrative Duke chooses to share with this Commission in its IRP. This Commission is not in a position to make a reasoned decision about the adequacy of Duke's approach to carbon dioxide regulation without a full and frank discussion in the IRP of the utility's carbon dioxide analyses and strategy.

Another critical problem with the Duke IRP is the very narrow range of carbon dioxide compliance costs analyzed in the IRP. The document presents a range of scenarios that includes carbon dioxide compliance costs only plus or minus 15% from the base case set of carbon dioxide prices. Tr. Vol. 2, p. 167. Environmental Intervenor witness Schlissel recommends analysis of a substantially broader range of scenarios. *Id.* At the evidentiary hearing, Duke conceded that it did not complete a broad range of sensitivities for carbon dioxide prices in the 2009 IRP. As with many deficiencies in its 2009 IRP, Duke glosses over this deficiency by assuring the Commission that it will include a broad range of sensitivities in the 2010 IRP. Tr. Vol. 4, p. 139.

The PEC IRP is remarkable for its complete failure to project future carbon dioxide emissions. Tr. Vol. 2, p. 143. Clearly, this Commission has no basis upon which to evaluate PEC's resource mix when the IRP includes no information about the volume of carbon dioxide that will be subject to regulatory controls in future. Additionally, as Environmental Intervenor witness Schlissel testified, the carbon dioxide prices PEC used in its 2009 IRP were not reasonable. Tr. Vol. 2, p. 159. Mr. Schlissel recommended that PEC examine a wide range of potential carbon dioxide prices in its 2010 IRP, such as the Synapse Mid, Low and High forecasts presented in his direct testimony. *Id.* at 162. The two main components of the future cost of carbon dioxide control will be the amount of carbon dioxide emission of any given utility, and the cost per ton assigned to those emissions (whether the control regime is a tax or cap and trade system, or some other mechanism). PEC's IRP provides no

information on the first component, and faulty information on the second. As a result, the analysis of future carbon dioxide controls in its IRP is entirely inadequate.

B. The Duke and Progress IRPs Ignore Other Imminent Environmental Compliance Costs for Existing Coal Units

The evidence shows that both the Duke and PEC IRPs fail to include substantive analysis of environmental compliance costs relating to coal combustion wastes and airborne pollutants. Although it is widely understood that the U. S. Environmental Protection Agency (“EPA”) will soon implement new or strengthened controls on numerous pollutants associated with the operation of coal-fired power plants (and in fact has already implemented one such control), neither the Duke nor the PEC IRP adequately assessed the increased compliance costs associated with these imminent regulations. As discussed below, PEC’s approach was to identify and discuss the areas of increased regulation, without making any attempt to monetize the cost of compliance with the upcoming regulations, and Duke performed even worse, failing even to acknowledge that additional regulation is imminent, beyond very general statements about increased regulatory scrutiny. In an industry where twenty-year forecasting is the norm, it is inconceivable that the Duke and PEC IRPs do not account for the cost of environmental regulations that will be enacted within months.

One glaring example of Duke’s and PEC’s failure to address increased environmental compliance costs is the area of coal combustion waste, which EPA has been very publicly moving to regulate since a massive coal ash spill at the Tennessee Valley Authority’s Kingston facility in December 2008. Tr. Vol. 2, p. 145. In his direct testimony, Environmental Intervenors witness Schlissel stated that EPA has identified risks to human health and the environment from the disposal of coal

combustion wastes in landfills and surface impoundments, and at the time the testimony was filed, was anticipated to regulate coal combustion waste in the near future. Tr. Vol. 2, pp. 145-7. Mr. Schlissel identified industry representations that potential EPA regulation of coal combustion wastes would result in “enormous” costs to industry, and would result in some owners deciding to prematurely shut down their plants rather than incur the cost of compliance. *Id.* at 149. Mr. Schlissel stated that the Tennessee Valley Authority has estimated the cost to clean up a coal combustion waste spill at the Tennessee Valley Authority Kingston plant at \$933 million to \$1.2 billion. *Id.* Mr. Schlissel concluded from his review of the 2008 and 2009 IRPs that Duke and PEC have not properly taken the potential cost of coal combustion waste regulations into account in their IRPs. *Id.*

As Mr. Schlissel predicted, on March 4, 2010, EPA announced its plan to regulate coal combustion wastes under the Resource Conservation and Recovery Act (“RCRA”).³ EPA plans to publish the proposal in the federal register on June 21, 2010, and will finalize the regulations after a 90-day mandatory public comment period – that is, as early as Fall 2010. *Id.* The rulemaking is the latest in a series of EPA actions since the December 2008 spill that are aimed at regulating coal combustion wastes. Among other steps, in March 2009, EPA issued requests to electric utilities including Duke and PEC for information relating to impoundments and other facilities that manage coal combustion waste at their sites. Both Duke and PEC responded in writing to the EPA requests, and ultimately 10 “high hazard”

³ <http://www.epa.gov/wastes/nonhaz/industrial/special/fossil/ccr-rule/index.htm#propose> (checked June 10, 2010).

disposal units were identified at Duke facilities in North Carolina.⁴ Thus, at the time of completing and submitting their 2009 IRPs, Duke and PEC were fully aware of the imminent regulation by EPA of coal combustion wastes, and Duke, moreover, knew that it had numerous units labeled “high hazard” that contain this dangerous waste. Yet, unbelievably, neither utility analyzed the cost of regulation of these wastes in its IRP.

Despite its ownership of numerous “high hazard” units that would be a primary target of the new regulations, Duke does not even discuss coal combustion waste in its 2009 IRP. *Id.* Tellingly, under cross-examination, Duke witness McMurry’s focus with respect to questions concerning coal combustion waste was to insist that it instead be called coal combustion byproduct. Tr. Vol. 2, p. 25. Mr. McMurry did, however, concede in his direct prefiled testimony that “depending on the requirements of future [coal combustion waste] regulation, the [Duke scrubbed coal units] could incur additional compliance costs.” Tr. Vol. 4, p. 96. Moreover, on cross-examination, he admitted that the outcome of EPA’s determination on regulating coal combustion wastes will have an impact on Duke’s existing coal plants. Tr. Vol. 2, p. 51.

The PEC IRP simply mentions consideration of coal combustion wastes as a hazardous waste, but does not appear to reflect the potential cost in its actual planning analyses. Tr. Vol. 2, p. 149. PEC witness Snider testified that PEC did not model any base case assumptions regarding the compliance costs associated with coal combustion waste regulation, and that it did not run any sensitivities based on costs

⁴ <http://www.epa.gov/waste/nonhaz/industrial/special/fossil/ccrs-fs/index.htm> (checked June 10, 2010).

associated with regulation of coal combustion waste. Tr. Vol. 1, p. 131. Despite PEC's failure to factor coal combustion waste regulation into its IRP, Mr. Snider appeared to confirm that such costs will be incorporated into the PEC 2010 IRP and could drive the timing of retirement of existing coal plants. *Id.*

The evidence shows that the Duke and PEC IRPs also fail to account for the cost of compliance with a host of other imminent EPA regulations applying to pollutants emitted from coal-fired power plants. As Environmental Intervenor witness Schlissel testified:

This year, the U.S. EPA already issued a new more demanding air quality standard for nitrogen oxides, and is scheduled to adjust standards relating to sulfur dioxide, particle pollution and ozone. EPA is also likely to issue regulations addressing interstate transport of air pollution. By 2011, EPA is scheduled to issue a federal implementation plan for regional haze, new source performance standards for key pollutants from electrical generating units and non-electrical generating unit boilers, and new standards for hazardous air pollutants, among other matters.

Tr. Vol. 2, p. 150. As Mr. Schlissel stated, "It certainly is reasonable to expect that in most or all cases, EPA action will result in more stringent regulation of these pollutants." *Id.*

Neither Duke nor PEC adequately factored into their IRP analyses the economic risks of continuing to upgrade existing coal-fired power plants in the face of new or more stringent air emission requirements. Duke's IRP barely touches on the topic of changes in air emission requirements. Duke IRP Rv. 1, January 11, 2010, pp. 31-34. The PEC IRP offers a similarly brief discussion of impending changes in air emissions requirements. PEC IRP, App. F, pp. F1-F3. Neither utility explains whether or how it factored these changes into its IRP analyses. Apparently, Duke did not factor the changes into its IRP analysis at all. In his direct testimony, Duke

witness McMurry conceded that the cost of imminent environmental regulation is not included in the company's IRP. Tr. Vol. 4, p. 96. He then went on to discuss how the IRP addresses *existing* requirements under the 8-year-old North Carolina Clean Smokestacks Act, which is irrelevant to the question of *future* regulations, and concluded that "It is too early to tell" if Duke will incur additional costs due to emerging environmental regulations. *Id.* at 96. However, Mr. McMurry seemed to concede that upcoming regulations will increase the costs of coal-fired generation. He stated, "based on the increased regulatory scrutiny from [sic] air, water and waste perspective," certain existing coal units will likely either be required to install additional controls or retire. Tr. Vol. 1, p. 265. In fact, Mr. McMurry implied that Duke in its internal planning is considering the upcoming mercury and ozone requirements, as well as additional requirements likely to be imposed in the wake of the judicially invalidated Clean Air Interstate Rule. Tr. Vol. 1, pp.50-51. Mr. McMurry even referred to a specific year – 2015 – that he believes will be a significant year for these additional regulations. *Id.* at 51. However, Duke included none of this information, or information about its planning processes, in its IRP. In fact, despite Mr. McMurry's acknowledgment that Duke will need to comply with maximum achievable control technology for mercury emissions, and that there will be a cost of complying with the maximum achievable control technology standard, even amounting to the need to retire coal units early, Tr. Vol. 4, pp. 146-7, the Duke IRP apparently includes no analysis of the costs of mercury control. The excuse is that the "Clean Air Mercury Rule" (CAMR) was judicially vacated; however, the rule was vacated because it was *not stringent enough*. Given that electric utilities will need to

go beyond the vacated CAMR standard to meet the stricter maximum achievable control technology standard in the very near future, Duke's decision to simply ignore the costs of mercury control in its IRP is unrealistic at best.

PEC also failed to factor imminent regulatory changes into its IRP analysis. PEC did file a separate *Plan to Retire 550 MWs of Coal Units Without SO2 Controls* ("Retirement Plan") in Docket No. E-2, Sub 960, which identifies most of the upcoming changes and concedes that the changes are restricted to result in more stringent pollution control standards. However, there is no evidence that PEC factored the regulatory issues discussed in the Retirement Plan into its 2009 IRP; and PEC witness Snider's testimony appears to confirm that PEC did not factor in the likely costs. PEC witness Snider stated that the additional costs for imminent environmental regulations would be reflected in capital costs associated with coal units, presumably because the regulations would require installation of additional control technologies. Tr. Vol. 1, p. 128. Mr. Snider responded on cross-examination that PEC did not run sensitivities to add additional capital costs to existing coal facilities based on the additional regulations, and that PEC would do so in its 2010 IRP. *Id.*

**C. The Flawed Assumptions in the Duke and Progress IRPs
Result in a Continued Over-Reliance on Coal-Fired
Generation**

The continued tendency of Duke and PEC to underestimate the true costs of coal-fired generation by ignoring rising environmental compliance costs skews their analysis of resource options in favor of coal-fired generation. As a result, in the analysis of resource options contained in their IRPs, coal is set up to artificially

"outcompete" other, cleaner resources that will not be subject to the same rapidly rising environmental compliance costs over the long term.

To compound the problem of consistently underestimating the cost of coal-fired generation, at the same time, the Duke and PEC IRPs overestimate the likely future costs of other, cleaner resources. For example, the IRPs do not take a careful enough look at current and projected costs for natural gas. Environmental Intervenor witness Schlissel described recent assessments suggesting that there is far more natural gas available in the domestic United States than previously thought, and how the additional supplies of natural gas have brought a structural change to the natural gas market. Tr. Vol. 2, pp. 139-43. In particular, Mr. Schlissel stated the increased supplies of natural gas should be able to accommodate any increased demands from fuel switching as a result of federal regulation of greenhouse gas emissions without causing significant increases in natural gas prices. *Id.* The phenomenon Mr. Schlissel described is not a short-term fluctuation downward in natural gas prices; it is a "seismic shift" in the domestic natural gas industry that has been acknowledged by that industry. *Id.* While Duke and PEC acknowledge that natural gas prices have been lower than expected, they have not adjusted their IRPs to reflect this current trend. Duke modeled lower natural gas prices, but only along with 25 percent lower coal prices. Tr. Vol. 4, p. 143. The company did not model lower natural gas prices as an independent variable. *Id.* This apparently was based not on a careful analysis of how natural gas and coal prices trend, but on an undocumented supposition made by Duke that a long-term lowering of natural gas prices might result in a lowering of coal prices. *Id.*

A comprehensive reworking of the analysis of the true cost of coal generation will not only reveal natural gas as a more cost-competitive alternative and support inclusion of more natural gas combined cycle generation in place of coal-fired generation in the utilities' resource mix, it will also support implementation of additional renewable resources. Finally, a more accurate analysis of the true cost of coal (along with the addition of lower polluting resources to each utility's resource mix) would support the retirement of additional coal-fired generation units.

CONCLUSION AND RELIEF SOUGHT

In conclusion, the 2008 and 2009 IRPs filed by Duke and PEC fail to meet minimum legal standards. These plans represent business as usual and not the low cost, low risk, clean energy future that this Commission and the North Carolina legislature envisioned for our State.


Therefore, we respectfully request that the Commission require all utilities in this docket to meet the following requirements in their 2010 IRP filings:

1. Each utility to utilize a comprehensive analysis of the potential for energy efficiency in the resource planning process which includes all cost-effective energy efficiency resources, or set a performance target based on a review of industry experience and available analyses of the potential for energy efficiency with due consideration of context and relevance.
- Utilities offering forecast energy efficiency program impacts of less than 1% retail sales for 2014 or beyond to provide comprehensive justification, including an independent evaluation of available evidence.

2. Each utility to evaluate demand-side resources on an equivalent basis to supply-side resources, considering a comprehensive set of options that reflects a range of investment levels in energy efficiency, and evaluating them on a systematic basis, particularly over the long-term. Among the resource options should be a “maximum achievable” program as well as sufficient intermediate options above the utility’s base case to identify an optimal level of investment.
3. Each utility to adopt resource planning practices that include consideration of risks that can cause short-term rate spikes.
4. Each utility to accurately project its annual carbon dioxide emissions over the period of time covered by the IRP, and to develop a plan for actually achieving significant reductions in carbon dioxide emissions over the coming decades (rather by relying on purchasing emission credits from others).
5. Each utility to analyze the supply of natural gas in the domestic United States, assess the current and future cost of natural gas as a fuel, and consider the addition of natural gas-fired combined cycle units to replace additional coal-fired generating capacity.
6. Each utility to consider the potential costs of EPA regulation of coal combustion wastes in IRP analyses.
7. Duke to consider a wider range of scenarios for carbon dioxide prices than plus or minus 15% around the base case.

8. PEC to employ a reasonable price for carbon dioxide, for example a price consistent with the prices used by Duke, Synapse Energy Economics, state commissions and other utilities.
9. Each utility to analyze alternatives for displacing additional coal units with natural gas-fired combined cycle units, adding more renewable resources and energy efficiency than are now included in the IRPs.
10. Each utility to submit a detailed and accurate discussion of the expected new pollution control standards during the 15-year planning horizon covered by the IRP and a demonstration of how the utility is factoring the financial risk of these standards into its IRP. If any utility has failed to adequately monetize the risk of impending regulation in its IRP, the modeling underlying the IRP should be rerun to reflect the additional cost of continuing to run existing coal plants and of constructing and operating supply-side resources in the future.
11. Each utility to file a revised retirement plan with their 2010 IRP showing retirement of additional coal units as possible.

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CERTIFICATE OF SERVICE

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

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