BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 790

In the Matter of:	)	
	)	JOINT BRIEF OF ENVIRONMENTAL
Application of Duke Energy	)	DEFENSE, N.C. WASTE AWARENESS
Corporation for Approval of an	)	AND REDUCTION NETWORK, N.C.
Electric Generation Certificate of	)	SUSTAINABLE ENERGY ASSOC.,
Public Convenience and Necessity to	)	SOUTHERN ALLIANCE FOR CLEAN
Construct Two 800 MW State of the	)	ENERGY AND THE SOUTHERN
Art Coal Units for Cliffside Project	)	ENVIRONMENTAL LAW CENTER

PURSUANT to N.C. Gen. Stat. § 62-65 and NCUC Rule R1-24, now come intervenors Environmental Defense, the N.C. Sustainable Energy Association, the N.C. Waste Awareness and Reduction Network, Southern Alliance for Clean Energy, and the Southern Environmental Law Center (the "Public Intervenors"), by and through the undersigned counsel, with a joint brief on issues before the North Carolina Utilities Commission ("the Commission") in this docket.

I. BACKGROUND

The Public Intervenors incorporate herein by reference the recitation of the procedural history of this proceeding set forth in their Joint Brief and Proposed Findings filed October 13, 2006 with this Commission.

This proceeding involves the application of Duke Energy Carolinas LLC ("the Company"), a subsidiary of Duke Energy Corporation ("Duke Energy") for a certificate of public convenience and necessity ("CPCN") for two new 800 MW pulverized coal units ("the Cliffside Project" or "Cliffside Units 6 and 7").

After the first round of hearings and briefing, on October 25, 2006, the Company filed under seal with the Commission a Notice of Updated Cost Information, in which it advised the Commission that the estimated capital cost of the proposed units had increased substantially. Although the Company initially refused to release an approximate cost figure to the public, after the Public Intervenors filed a motion seeking to compel disclosure of the approximate updated costs, the Company filed with the Commission a public document stating that the revised cost estimate was approximately $3 billion, less AFUDC.

On November 3, 2006, the Commission entered an Order Reopening Record and Scheduling Further Hearing, which stated that the Commission would receive further evidence and cross-examination on the Company's updated cost information and related issues. On November 29, 2006, the Company supplemented its application with additional information and prefiled testimony regarding the updated cost estimate, and on January 8, 2007, intervenors filed testimony addressing the Company's testimony.

Although the Commission did not initially schedule additional public hearings, in response to a request filed by N.C. Waste Awareness and Reduction Network, the Commission held well-attended public hearings on the updated cost information in Charlotte on January 10, 2007, and in Shelby on January 11, 2007, at which many interested members of the public expressed concern over the increased cost and environmental impact of the proposed units. A formal evidentiary hearing on the updated cost information and related issues was held in Raleigh on January 17-19, 2007. The testimony and exhibits offered into evidence at that hearing are the subject of this brief.

II. LEGAL STANDARD

The Public Intervenors incorporate herein by reference the legal standard for an application for a certificate of public convenience and necessity set out in their Joint Brief and Proposed Findings filed with this Commission on October 13, 2006.

As the applicant, the Company has the burden of proof pursuant to N.C. Gen. Stat. §§ 62-110 and 110.1 to show that the proposed Cliffside units are in the public convenience and are necessary. *State ex rel. Utils. Comm'n v. Empire Power Co.*, 112 N.C. App. 265, 279, 435 S.E.2d 553, 560 (1993) (Commission's dismissal of application was proper where forecast of evidence on the issue of need was inadequate). The Company has not met this burden.

The public convenience and necessity standard includes two elements: need and cost. *State ex rel. Utilities Comm'n v. Empire Power Co.*, 112 N.C. App. 265, 279-80; 435 S.E.2d 553, 561 (1993) ("before issuing a CPCN, [the Commission] must establish a public need for a proposed generating facility"), *disc. review denied*, 335 N.C. 564, 441 S.E.2d 125 (1994); *State ex rel. Utils. Comm'n v. High Rock Lake Ass'n.*, 37 N.C. App. 138, 140, 245 S.E.2d 787, 790 ("the purpose of requiring a certificate of public convenience and necessity before a generating facility can be built is to prevent costly overbuilding"), *disc. review denied*, 295 N.C. 646, 248 S.E.2d 257 (1978). As discussed below, the Company has not demonstrated a need for the new units, and has failed to show that they are the least cost option—or even the most prudent investment decision—for North Carolina ratepayers.

III. ARGUMENT

A. Because the Company has failed to maximize its use of energy efficiency, has failed to incorporate into its analysis new data on the potential for energy efficiency, and in fact proposes to sell half of the capacity of the Cliffside units, the Company has not demonstrated that it needs the 1600 MW Cliffside expansion to meet demand, as required to support its application for a certificate of public convenience and necessity.

1. The Company's recent "commitments" regarding energy efficiency cannot compensate for its failure to maximize its use of energy efficiency, which could offset or delay the need for new generating capacity such as the Cliffside units.

Perhaps in an attempt take the sting out of the new, approximately $3 billion cost estimate and to make the proposed Cliffside units more palatable to the Commission and the public, Duke Energy Carolinas has included in its supplemental testimony in this docket a number of "commitments" regarding energy efficiency. None of these "commitments" is enforceable, however, and all are so encumbered by caveats and qualifications as to be rendered practically meaningless.

Duke Energy CEO Jim Rogers testified that the Company is "committed" to spending 1 percent of annual revenues, or approximately $50 million, on energy efficiency programs. Supp. Testimony of James Rogers, p. 4. On cross-examination, however, Mr. Rogers testified that this figure would include spending not only on energy efficiency, but also on demand response programs. Supp. Tr. Vol. 6, p. 78; Supp. Tr. Vol. 6, p. 130.[1] Ms. Hager also testified that the $50 million would be spent on new programs—so any dollars being spent on existing programs would not be counted, and there could be a decrease in those amounts or the existing programs. Supp. Tr. Vol. 4, pp.

[1] Transcript references are to the electronic versions of the transcripts from the hearing held January 17-19, 2007.

11-12. Details on the timing of this spending, or even on what type of programs the money might be spent, were absent from the Company's testimony. Mr. Rogers testified that the $50 million "commitment" was contingent on "appropriate regulatory treatment," but was unable to explain what was meant by this. Supp. Tr. Vol. 6, pp. 80-81. When asked where the "commitment" to spend 1 percent of annual revenues on energy efficiency would be lodged (i.e., would it be part of the Cliffside certificate? The IRP process?), Mr. Rogers did not respond directly to the question. Supp. Tr. Vol. 6, pp. 106-07.

Similarly, the Company's "commitment" to retire additional older coal units as demand is reduced by energy efficiency is not memorialized anywhere, and critical details are lacking, such as which units would be shut down and whether they could be brought out of "retirement"—essentially rendering the Company's "commitment" nugatory. Rogers testified that the "commitment" is tied to building additional capacity at Cliffside. Supp. Tr. Vol. 6, p. 71. Mr. Rogers did agree to direct the Company's attorneys to put it in their brief filed with the Commission, but otherwise the offer is not enforceable. Supp. Tr. Vol. 6, p. 128.

In short, these vague, eleventh-hour "commitments" by Company officials to do some work on energy efficiency, some time in the future, cannot substitute for the aggressive energy efficiency program the Company should have undertaken years ago (and, failing that, should be implementing now), which could offset or delay the need for new generating capacity, including the proposed Cliffside units.

2. In its analysis purporting to justify the decision to pursue the new units despite the cost increase, the Company failed to consider important new

findings on the potential for energy efficiency and renewable energy sources for North Carolina.

The Company's reanalysis of the justification for the Cliffside plant in light of significantly higher capital costs entirely failed to consider new data on the potential for energy efficiency and renewable energy sources for North Carolina. As a result, the Company's analysis exaggerated the need for the Cliffside expansion. The new data are included in two reports prepared for the Commission at the request of the North Carolina Environmental Review Commission. Both reports show far greater potential for energy efficiency and renewable energy resources than was considered in the Company's reanalysis.[2] The Commission should conclude that the Company's analysis of the need for the proposed Cliffside plant is incomplete and inadequate because it does not reflect the realistic potential for energy efficiency and renewables. The Company's analysis does not, therefore, satisfy the policy of the Public Utilities Act that utility service to meet future growth "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." N.C. Stat. § 62-2(3a).

Instead of utilizing the new energy efficiency data in its analysis, the Company continued to rely upon its previous estimate of only 101 MW of energy efficiency throughout its modeling period or approximately 500 GWh, which is about 4% of the amount which could be achieved. Supp. Tr. Vol. 3, pp. 144 – 53; Supp. Tr. Vol. 5, p. 50. The GDS Associates study concluded that the achievable cost-effective potential for

[2] GDS Associates, Inc. *A Study of the Feasibility of Energy Efficiency as an Eligible Resource as Part of a Renewable Portfolio Standard for the State of North Carolina* (2006). La Capra Associates, Inc. *Analysis of a Renewable Portfolio Standard for the State of North Carolina*. Supp. Tr. Vol. 3, pp. 10 – 21. Schlissel and Sommer Ex. 1, 2.

energy efficiency in North Carolina would reduce electric energy use by 14 percent in 2017. Expert witnesses Schlissel and Sommer applied the results of the GDS study to the Company service's area and testified that the Company could potentially reduce electric energy use by over 12,000 GWh by 2017. The amount of cost-effective energy efficiency that the Company could achieve would exceed the amount of electricity projected to be generated by both units of the Cliffside plant in 2017 (under 12,000 GWh). If the Company only utilized one of the two Cliffside units, as in the partial ownership scenario, and retired older coal units as proposed, then the amount of cost-effective energy efficiency would be nearly double the amount of electricity to be added to the Company's system. These numbers are likely to be conservative, because the GDS report used $50/MWh as the cost-effectiveness screening level, while the cost of new coal-fired generation capacity, such as the Cliffside plant, will be significantly higher. Direct Supplemental Testimony of Schlissel and Sommer (Confidential Version), pp. 29 – 34. In all probability, Duke could achieve even more than the 12,000 GWh by 2017.

The Company also gave short shrift to renewable energy sources in its analysis. In fact, the Company failed to include <u>any</u> renewable energy resources in its analysis of new capacity, screening them out in the first step of its modeling. The La Capra Associates Renewable Portfolio Standard report, on the other hand, concluded that North Carolina has sufficient resources to achieve a 5% renewable portfolio standard ("RPS"), whether energy efficiency is included or not, which could result in the avoidance of approximately 1,000 MW of new generating capacity. Based upon the findings of the La Capra report, Schlissel and Sommer concluded that renewable resources can reduce the demand for new electricity generation capacity in the Company's service area in North

Carolina. Supp. Direct Testimony of Schlissel and Sommer (Confidential Version), pp. 34 – 37. The Company's failure to include any renewable energy resources in its analysis further undermines the Company's already shaky case for the Cliffside expansion.

3. The Company's joint ownership proposal further undermines the argument that the 1600 MW Cliffside plant is needed and adds further uncertainty to the CPCN application.

In an effort to divert attention from the fact that the reanalysis of a significantly more expensive 1600 MW Cliffside plant showed that it is not the least cost alternative, the Company introduced for the first time in the Supplemental Hearing the idea that it could sell half of the capacity (800 MW) to another utility. Supp. Direct Testimony of Jim Rogers, pp. 6, 15; Supp. Direct Testimony of Janice Hager, pp. 4, 11. The proposal to sell half of the capacity of the plant and replace it with smaller intermediate combined cycle capacity further undermines the claimed need for the 1600 MW Cliffside baseload plant, and adds yet another level of uncertainty to the application that is before the Commission.

The Company's analysis of full ownership versus partial ownership of Cliffside produced the obvious result, based on economies of scale, that getting 800 MW of capacity at the $/MW cost of a 1600 MW plant is more economical than getting 800 MW of capacity at the $/MW cost of an 800 MW plant. Hager Supplemental Exhibit 7 and Hager Supplemental Updated Exhibit 7; Supp. Tr. Vol. 4, pp. 80 – 81. Under the Company's shared ownership scenario, the 800 MW of baseload coal capacity from Cliffside that would be sold would be replaced by 585 MW of natural gas combined cycle. Hager Supp. Direct Testimony at 11; Supp. Tr. Vol. 4, p. 96.

As questions from the Commission and intervenors pointed out, in order for a partial ownership proposal to be considered, the Company would first have to secure approval of the 1600 MW plant, then secure approval in a separate proceeding for the 585 MW of natural gas combined cycle to be added on top of that. Then the other utility (which the Company refused to name in public testimony) would have to formally demonstrate to this Commission, through a CPCN proceeding, that the public convenience and necessity requires 800 MW of new coal capacity from the Cliffside plant in its service area. Supp. Tr. Vol. 5 (Confidential Version), pp. 96, 157-58. There is, of course, no such application before the Commission. At this point, as the Company emphasized in its refusal to discuss the identity of the potential buyer, there is not even a definite buyer for the additional capacity. In fact, there is no competent evidence in the record supporting this theoretical third party's need for the 800 MW of capacity from the Cliffside units. Thus, the Company's hope that it may be able to secure a buyer is not competent evidence that can support the Commission's consideration of the application for the 1600 MW Cliffside plant.

B. In light of the new cost information, the proposed Cliffside units are not the least cost option.

1. The Company's modeling shows that the "All Gas & Nuclear" portfolio will cost the rate payers less than the "Balanced Cliffside" portfolio.

Subsequent to the disclosure of the increased cost estimate for the Cliffside units, the Company reran its three models that are used to determine the least cost mix of generation as part of its Integrated Resource Plans ("IRP") pursuant to G.S. 62-110.1. The results of these tests – the updated busbar screening curves, the Capacity Expansion

Model ("CEM") and the Planning and Risk model ("PaR") – demonstrated that the proposed Cliffside units were no longer the least cost option to meet the Company's forecasted load growth. As discussed above, both energy efficiency and IGCC were inappropriately eliminated early in this process, which renders the Company's analysis fatally flawed. Even taking the Company's resulting modeling at face value, however, the results do not support the Company's decision to proceed with Cliffside, because they reveal that Cliffside is not the least-cost option.

As the Commission is well aware, the public convenience and necessity standard incorporates N.C. Gen. Stat. § 62-2(a)'s requirement that electric utility planning result in the "least cost mix" of resources. Consistent with this requirement, for at least the last 30 years, the Commission has not approved, and the Public Staff has not supported, a generating facility other than the one that is the least cost option.

Company Witness Hager testified about the modeling process utilized by the Company. Her testimony—and, apparently, the Company's "updated" analysis—relied heavily on the earlier work done in preparation for the 2006 IRP, which has not been approved by the Commission, and which failed to give serious consideration to energy efficiency or IGCC. Hager Direct Supplemental Testimony, p. 3. Of the six portfolios Ms. Hager described in her prefiled supplemental testimony, under the base case, the least cost option is the one designated as "All Gas and Nuclear." Hager Direct Supplemental Testimony, p. 4. Notably, in light of the increased cost estimate, the proposed Cliffside units are no longer part of the least cost portfolio.

There are several ways to compare the costs of the different portfolios. The Company presents the portfolios in terms of the difference of the present value revenue

requirements ("PVRR"), divided by the present revenue expectation over the 35-year study period, about $49 billion. On cross-examination in closed session, Ms. Hager ranked the six portfolios presented on her prefiled testimony at page 4 and the difference in PVRR between the "Balanced Cliffside," All Gas & Nuclear, and the other portfolios that emerged from the modeling process. [BEGIN CONFIDENTIAL.

END CONFIDENTIAL]. The Company's calculation of the rate impact is based on the percent difference between any of the portfolios with the base case, divided by the expected revenue. The rate impact of the "Balanced Cliffside" portfolio is .3-.5%, but even the most costly of these scenarios only has a [BEGIN CONFIDENTIAL END CONFIDENTIAL] difference.[3] Even Mr. Rogers characterized the choice of the Cliffside units as requiring the ratepayers to pay a "premium" from the base case. Rogers Supplemental Testimony, p. 14.

[3] Given the range of uncertainties and the present value of the $49 billion in revenue projected over the 35-year planning period, any one of the portfolios will have only a slight rate impact difference when compared to any other. In other words, any amount of PVRR difference divided by 49 billion gives only a slight rate impact.

The comparison of PVRR presents a specious argument as it does not consider the overall rate impacts from each of the options or more importantly, the overall cost to the ratepayers during this time period. On cross-examination in closed session, Ms. Hager compared the present value of construction costs plus the allowance for funds used during construction ("AFUDC"), or financing costs, for each of the types of generating plants. [BEGIN CONFIDENTIAL

END CONFIDENTIAL]. Company witness Rogers and others also testified in several instances to the uncertainty of using nuclear generation in what he characterized as the near-term, i.e., before 2020.

In comparing the two less costly alternatives, All Gas and Nuclear and the "Balanced Cliffside," the cost of the nuclear plants cancel out and the comparison is the 1600 MW of Cliffside plus 2771 MW in combustion turbines in the Balanced Cliffside portfolio to 1170 MW of combined cycle plants and 3010 MW of combustion turbines in the All Gas and Nuclear portfolio. Hager Direct Supplemental Testimony, p. 4. Using the present estimates of construction costs and AFUDC provided by Ms. Hager, the costs

of the Balanced Cliffside less the nuclear is [BEGIN CONFIDENTIAL.

END CONFIDENTIAL] compared to

[BEGIN CONFIDENTIAL END

CONFIDENTIAL] for All Gas and Nuclear, again less the nuclear. This is a significant difference, in that the ultimate costs to the ratepayers is based on the amount of the construction costs that go into the rate base, and the cost recovery of the AFUDC. Despite Company witness Rogers' protestations that the Company did not look at the costs of the plants and only acted in the best interest of its rate payers, it is obvious that the more costly Balanced Cliffside portfolio gives the Company a significantly greater rate base resulting in greater profits for the company and higher rate increases for the rate payers. Supp. Tr. Vol. 6, pp. 187-88.

As discussed below, the Company has relied on a flawed modeling approach to inappropriately eliminate potentially lower-cost options such as energy efficiency and IGCC. Even assuming for the sake of argument, however, that the Company's modeling approach was reasonable, the least cost portfolio identified by the modeling—All Gas and Nuclear—will benefit the rate payers significantly more than the "Balanced Cliffside" portfolio, both in decreased costs and, as discussed below, in the ability to minimize risks and uncertainties.

2. The Company is asking the Commission to depart from the statutory least-cost standard and adopt a management decision that is premised on unsupported assumptions and that is not in the best interest of the Company's ratepayers.

The Company's rationale for selecting the "Balanced Cliffside" portfolio, despite the fact that it was no longer part of the lowest-cost portfolio, was presented in the prefiled supplement testimony of both Ms. Hager and Mr. Rogers. According to this

testimony, the Company management made the decision to continue advancing the Cliffside project based on the following assumptions:

- A portfolio that includes only gas and nuclear performs well under base case assumptions, but such a resource plan is more risky and less robust than the "balanced" plan that includes the Cliffside Project, new nuclear and new gas;
- The Cliffside Project is a good hedge against natural gas price volatility;
- The Cliffside Project is a good hedge against the potential inability to construct new nuclear plants during the near term;
- Partial (50%) ownership of the Cliffside Project is economically efficient, and a plan that includes 50% of Cliffside is essentially equivalent in cost to a "least cost" only gas and nuclear plan.

Rogers Direct Supplemental Testimony, p. 4. These are unsupported assumptions that the Company has made about conditions that may occur in the marketplace and reflect the Company management's preferences should all these assumptions turn out to be true. In essence, then, the Company is asking the Commission to accept its assumptions about the marketplace and its preferences for how to respond to uncertainty--even in the face of the greater costs. Putting aside for the moment whether the Commission should deviate from the least-cost path as a legal matter (it should not), as a practical matter, the "hedge" justification does not hold up as the rationale for the more costly option:

1. The Company should compare the various portfolios with their present system as it is being operated today. Company witness Hager testified that compared to other utilities, the Company uses very little natural gas, with gas-fired generation at 16% of the system generating capacity and only 1% in terms of energy. Hager Supplemental Exhibit 6. The remainder of the energy is split between nuclear and coal. With most of its load now met with coal and nuclear, if the Company genuinely wished to balance its system, it

would invest in more natural gas generating capacity and, as urged by the Public Intervenors, significantly more energy efficiency and renewables.

2. The claim that the Cliffside units are a hedge against "volatile", i.e., higher, natural gas prices does not hold up because of the relatively small amount of natural gas the Company is currently using in its system. Moreover, Environmental Defense-SACE-SELC witness Schlissel offered uncontroverted testimony that the long-term forecasts for the price of natural gas had significantly decreased in the past year. Supp. Tr. Vol. 3, p. 100. Mr. Schlissel also testified that with about 15 percent of capacity and only 1% of the Company's energy produced by natural gas, which means that the Company really is not susceptible to volatility in natural gas prices. Supp. Tr. Vol. 3, p. 81.

3. As to the notion that the Cliffside units supply a hedge against the lack of a viable, cost-effective and timely nuclear option, this may be true, but it is also true that any new generation facility or load-reducing energy efficiency program will also be a hedge against an uncertain nuclear option.

4. The flaws of the last rationale—the Company's admission that selling a partial 50% ownership in the proposed Cliffside units is "economically efficient"—are discussed elsewhere in this brief. This last rationale was not, of course, raised at the first round of hearings on the Certificate, but only emerged because of the excessive cost of the proposed Cliffside units.

In addition to the direct cost savings to ratepayers over decades, the least cost portfolio would also provide a more effective hedge against risk for the ratepayers in several ways:

1. Natural gas units, either combustion turbines or combined cycle, have a much shorter lead time for planning and can be phased in as needed. Combustion turbines have a two-to-two-and-a-half-year lead time and combined cycle units can be brought online in

three years. Supp. Tr. Vol. 5, pp. 151-152. This is a clear hedge against the low-growth scenarios caused either by an economic turndown or by a reduction in demand from an aggressive energy efficiency program, as advocated by the Public Intervenors and supported by recent studies.

2. Natural gas units are a clear hedge against future carbon regulation and at the same time, lessen the environmental impact. There were various discussions of carbon taxes and/or a cap-and-trade scheme at hearing, but witnesses agreed that there were a considerable number of uncertainties. Public Intervenor witness Schlissel concluded that big new conventional coal plants were a bad hedge against carbon taxes and future regulatory schemes. Supp. Tr. Vol. 3, pp. 100-01.

3. Like any other generating facilities or energy efficiency programs, natural gas units are a hedge against the risky nuclear option.

4. Natural gas units can easily supply the same energy benefits as the old Cliffside Units 1 through 4, and with much lower carbon emissions and less cost to operate. As a result those units can be retired.

In short, the Company is asking the Commission to substitute its judgment for that of the General Assembly by departing from the statutory least-cost standard and instead adopting the management decision of the company. Even if it were permissible to depart from the least-cost standard, which we do not concede, this management decision, premised on unsupported assumptions about what may or may not occur in the future, is not in the best interest of the Company's ratepayers.

3. The Company's modeling analysis was flawed and does not demonstrate that the proposal for the Cliffside plant would be the least cost option.

The Company used models inappropriately in an attempt to demonstrate that the Cliffside plant is the preferred option, despite the more than $1 billion capital cost increase, by not allowing the Capacity Expansion Model ("CEM") to choose higher

energy efficiency levels, by not allowing the CEM to choose renewable resources, by not using the results of the CEM to create portfolios for further analysis by the Planning and Risk module, and by using the CEM in the linear programming mode versus the mixed integer programming mode.

The Company has relied on a three-step integrated resource planning methodology to support its application throughout this process. This three-step process includes: (1) a screening step in which the Company uses qualitative measures and busbar screening of cost per unit of electricity to decide which resources to use in the CEM; (2) CEM, which is a computer model that selects the least cost portfolio from among the resources input into it; and (3) the Planning and Risk ("PAR") model, which involves sensitivity analysis (varying assumptions on inputs to determine the effect on the overall projected cost) using more detailed modeling of operating costs to determine the present value of revenue requirements ("PVRR") for different portfolios of resources that are provided to the model based on the CEM results. Supp. Direct Testimony of Janice Hager, p. 2; Supp. Direct Testimony of Schlissel and Sommer (Confidential Version), p. 5; Supp. Tr. Vol. 3, pp. 73 – 74.

The expert testimony and cross examination in the Supplemental Hearing brought to light several flaws in the Company's analysis. First, in the screening step the Company inappropriately screened out energy efficiency resources by assuming that 101 MW of energy efficiency is the maximum amount that would be achieved. By doing this, the CEM was not permitted in the second step to choose additional cost-effective energy efficiency that would likely have reduced the CEM's selection of more expensive coal-fired generation resources, particularly in light of the escalation in the capital costs of

coal and the likelihood of a carbon tax. Supp. Direct Testimony of Schlissel and Sommer (Confidential Version), pp. 9 – 11; Supp. Tr. Vol. 3, pp. 88 – 95; Supp. Tr. Vol. 5, pp. 53 – 54. The witnesses testified that the CEM could have been programmed with the ability to select the appropriate amount of energy efficiency resources in the same manner that it selects generating resources to arrive at the least-cost portfolio. Supp. Tr. Vol. 3, pp. 88 – 95. Supp. Tr. Vol. 5, pp. 52 – 53.

The Company argued that the 101 MW of energy efficiency carried through the modeling as a fixed amount over the modeling period is "indicative of the level of energy efficiency that will be found to be cost effective." Supp. Tr. Vol. 5, p. 50. This argument was contradicted by the testimony of Mr. Rogers, who agreed that a more aggressive program to promote energy efficiency would produce much higher results, and by the testimony of Schlissel and Sommer based on the GDS Associates report on the potential for cost-effective energy efficiency in North Carolina. Supp. Tr. Vol. 6, pp. 104-05; Supp. Direct Testimony of Schlissel and Sommer (Confidential Version), pp. 29-34. The Company also argued that it is premature to assess energy efficiency programs as resources in the CEM until its collaborative process is complete, including its own study of energy efficiency potential. Supp. Tr. Vol. 5, p. 50 – 51. This argument presumes that it is somehow acceptable to move forward with approval of the CPCN without an adequate analysis of energy efficiency resources, when the Company could have used existing available information on cost-effective energy efficiency programs in the CEM or postponed its application until its own analysis of energy efficiency measures is complete.

Similarly, the Company screened out renewable energy resources in the screening step, so that the CEM was not able to choose an appropriate amount of renewable energy resources in putting together the least-cost portfolio. Again, given the escalating capital costs of coal plants and the likelihood of a carbon tax, it is possible that some level of renewable resources would have been chosen had the CEM been given these inputs. Supp. Direct Testimony of Schlissel and Sommer (Confidential Version), pp. 9 – 10; Supp. Tr. Vol. 3, pp. 88 – 95. The La Capra report provides support for wind and biomass resources as part of a least-cost mix of generating options. Supp. Direct Testimony of Schlissel and Sommer (Confidential Version), pp. 34 – 37.

Expert witnesses Schlissel and Sommer agreed that some screening is necessary to screen out obviously inappropriate resource options before running the CEM. But they testified that CEM is typically run with energy efficiency and renewable resource choices, and that the results would have likely been different in this case if it had been. Supp. Tr. Vol. 3, pp. 88 – 95.

A third flaw in the Company's modeling is the manner in which the CEM results were carried forward to the third step, the PAR module. Instead of using the portfolios that were identified as least cost in the latest CEM runs, the Company ran the PAR with the same portfolios that it had used in its 2006 IRP. It is clear from Table 1 in the Confidential Testimony of Schlissel and Sommer that none of the CEM results chose 1600 MW of Cliffside coal-fired power generation in the 2011-2012 timeframe. Only the High Load and No New Nuclear runs chose amounts of coal-fired capacity in this range, but the selection was for later time periods. The base case or "most likely" case only selected 270 MW of pulverized coal capacity and not beginning until 2013. With a

carbon dioxide ("CO_2") tax no coal-fired capacity was chosen. Supp. Direct Testimony of Schlissel and Sommer (Confidential Version), pp. 5 – 8.

Company witness Hager agreed that Table 1 from the Schlissel and Sommer testimony accurately reflected the results of the Company's latest CEM runs. The Company explained the disconnect between the latest CEM results and the scenarios used in the PAR module as follows:

> Due to the short time limit, Duke used the existing portfolios that were used in the 2006 plan and updated the capital costs in the results. Therefore, the portfolios best agree with the original 2006 CEM runs, and not exclusively the newest CEM runs. The newest CEM runs for the most part universally show lower coal due to the higher CAPEX coal costs, so it will be difficult to exactly match updated CEM with portfolios . . . if SACE continues to try to match new CEM exactly with the original portfolios, it will be a fruitless exercise.

SACE Hager Cross Ex. 1, Supp. Tr. Vol. 5, pp. 57 – 60.

A fourth major flaw in the way in which the Company used the CEM model was the use of linear modeling versus the mixed integer approach. Table 1 of the Schlissel and Sommer prefiled direct testimony reflects the use of the linear modeling approach in which the CEM can choose the appropriate amount of capacity for the least-cost portfolio even if it results in capacity numbers that would not be of the size that would normally be built. For instance, Table 1 shows that in the linear mode the CEM Base Case chose 255 MW of pulverized coal in 2013. It is unlikely that this unit size would be built economically.[4] In the mixed integer mode the CEM can choose preselected unit sizes input into the model with their appropriate capital and operating costs (e.g., 800 MW or 1600 MW). The Company argued that it is appropriate to use linear mode and then use

[4] Additionally, the CEM results reflect coal capacity costs at the 1600 MW size, which would be much cheaper on a $/MW basis than smaller capacity unit sizes. Supp. Tr. Vol. 5, p. 62.

judgement to decide how much coal capacity and in what years based on the results. But when the Company ran two CEM runs in the mixed integer mode, they chose less coal and in later years than the same scenarios in the linear mode. Without rerunning the models it is impossible to tell how the results were affected by the use of the linear mode. Supp. Direct Testimony of Schlissel and Sommer (Confidential Version), pp. 8 – 9.

In sum, the Company's analysis of capacity needed to meet projected demands was flawed in several respects and does not provide the competent, material, and substantial evidence required to meet the Company's burden of proof for approval of the CPCN.

4. The Company failed to conduct an "apples-to-apples" comparison of SCPC and IGCC costs, which would show that IGCC is cost-competitive with SCPC.

The testimony of Environmental Defense, SACE and SELC witness Douglas Cortez surveyed capital costs for integrated gasification combined cycle ("IGCC") and supercritical pulverized coal ("SCPC") plants and provided evidence from the public literature that IGCC will prove to be the least-cost resource for coal-to-power plants in the U.S., including the Cliffside plant, when factors such as technology improvements and control of climate change gases are taken into account. (Cortez testimony, p. 2). Dr. Cortez concluded that that if an "apples-to-apples" comparison of SCPC and IGCC with carbon capture were done, IGCC would be a lower cost resource than SCPC.

Dr. Cortez critiqued the Company's capital cost analysis, noting that the Company's estimate of [BEGIN CONFIDENTIAL END CONFIDENTIAL], from the Edwardsport IGCC project, appeared to be high, given that other private studies he was familiar with show today's cost of IGCC at a greenfield site operating on

bituminous coal at $2000 to $2300/kW, and construction at a brownfield site, such as Cliffside, should reduce the construction cost of an IGCC plant compared with the greenfield cost. (Cortez testimony, p. 17). Company witness Mr. Rose testified that in addition to "brownfied versus greenfield" considerations, adjustments are needed to coal plant costs to account for the heterogeneity of plants and U.S. conditions, including fuel costs, design, location, size, and other data such as financing and transmission costs. Supp. Tr. Vol. 6, pp. 19-20. Both Mr. Rose and Mr. McCollum testified, however, that other than labor costs, no significant adjustments were made to the IGCC cost estimate to take into account conditions specific to the Cliffside site. (Supp. Tr. Vol. 2, p. 28; Supp. Tr. Vol. 6, p. 21-22). The fact that these adjustments were not made casts doubt on the accuracy of the IGCC estimates used in the Cliffside analysis.

Dr. Cortez also observed that the Company compared the 632 MW Edwardsport IGCC cost estimate with the estimate for 1600 MW PC units at Cliffside, and based on this comparison, concluded that IGCC would cost [BEGIN CONFIDENTIAL END CONFIDENTIAL] more capital per kW than the Cliffside units. Dr. Cortez testified that if the Company were to compare similarly sized units, the construction costs of IGCC and SCPC would be much closer. (Cortez testimony, p. 18). Dr. Cortez testified that, based on his review of the literature, an IGCC plant *without* carbon capture would cost about 5 to 16% more to construct than an SCPC plant. (Cortez testimony, p. 8). Dr. Cortez testified that were such an "apples-to-apples" comparison to be made, IGCC and SCPC would have closer costs and economics, but since the Company has not performed such an analysis, we do not have the data for Cliffside. (Cortez testimony, p. 18).

Dr. Cortez also testified that if an "apples-to-apples" comparison of SCPC and

IGCC with carbon capture were done, IGCC would be less expensive than SCPC. Supp. Tr. Vol. 1, p. 62. According to Dr. Cortez' testimony, for SCPC and IGCC technologies constructed with carbon capture equipment, the IGCC technology has clear advantages: an 8 to 23% lower cost of electricity ("COE"), 14 to 18% lower plant construction costs, and a higher efficiency (a 12 to 24% lower heat rate). (Cortez testimony, p. 9). Dr. Cortez further testified that retrofitting IGCC plants with carbon capture equipment will be much cheaper than retrofitting SCPC plants: CC can be added to an IGCC plant at an added COE of about 26 to 34% compared to a much higher added COE for SCPC of about 51% to 78%; IGCC requires about 29 to 39% more capital, while SCPC requires 72% to 75% more capital; and SCPC technology incurs a steeper heat rate penalty than does IGCC (about a 40% rise in heat rate vs. about 20% for the IGCC plants. (Cortez testimony, p. 11). Mr. Rogers agreed that based on current estimates, outfitting an IGCC plant with carbon capture equipment would increase the cost of electricity by about 30 percent, versus 68 percent for a SCPC plant. (Supp. Tr. Vol. 6, p. 151). Under cross-examination, Dr. Cortez testified that the Company had not provided enough information on the relative cost of supercritical pulverized coal versus IGCC to allow the Commission to determine which was the lower-cost option. (Supp. Tr. Vol. 1, p. 65).

Company witness McCollum testified regarding a draft report prepared under the auspices of the Climate Change Policy Partnership at Duke University's Nicholas Institute, a project of which Duke Energy is the founding corporate funding partner. (Supp. Tr. Vol. 2, p. 41). Mr. McCollum agreed on cross-examination that the purpose of the report, entitled "Are IGCC and Carbon Capture and Storage Viable for Duke Energy in North Carolina?," was to compare the cost of pulverized coal to that of IGCC and

determine whether IGCC was a feasible option for Duke Energy Carolinas. (Supp. Tr. Vol. 2, p. 46). [BEGIN CONFIDENTIAL

END CONFIDENTIAL] Testimony of Kevin O'Donnell, p. 3. This finding, by an independent research institute funded by Duke Energy, buttresses the conclusions of intervenor witness Cortez. Although the Company had received a draft of the report in August 2006, prior to the September hearings in this docket, the Company failed to take into account, or to bring to this Commission's attention, evidence presented in the report.

Ms. Hager testified that the Company's analysis expressed costs in terms of present value of revenue requirements, and agreed that this is necessary for an "apples-to-apples" comparison of resource costs. Supp. Tr. Vol. 4, p. 21. Ms. Hager testified, however, that the Company did not run IGCC through its PaR [planning and risk] model, and therefore could not compare the PVRR of a portfolio containing IGCC with other resource portfolios containing SCPC. Supp. Tr. Vol. 4, p. 35. Mr. Schlissel testified that the Company should not have screened out IGCC at the busbar screening curve stage, given the technology's potential to significantly reduce or eliminate CO_2 emissions from coal. Supp. Tr. Vol. 3, p. 117. According to Mr. Schlissel, IGCC would also be a good hedge against high natural gas prices. Supp. Tr. Vol. 3, p. 118.

C. The proposed Cliffside units would not be an effective hedge against mandatory federal carbon regulations.

As discussed above, the Company's current rationale for advancing the Cliffside project, now that it is no longer part of the least-cost portfolio, is that it provides a hedge against the possibility of higher-than-expected gas prices and against the possibility that

new nuclear generation won't be built. Hager Supp. Direct Testimony, p. 8, l. 16-19. The Cliffside units would not, however, provide an effective hedge against these uncertainties. Building SCPC units at Cliffside would also not provide an effective hedge against the very real possibility—indeed, the virtual certainty—of mandatory federal carbon regulations. As ED, SACE and SELC witness Schlissel testified, building 1600 MW of pulverized coal is "the opposite of a good hedge; it's a risky investment." Supp. Tr. Vol. 3, p. 105.

The Company continues to underestimate the impact of mandatory federal carbon regulations on the cost of the Cliffside units. Company witnesses agreed that mandatory federal carbon regulations are imminent. Rose, Supp. Tr. Vol. 6, pp. 22-23; Rogers, Supp. Tr. Vol. 6, p. 150. Mr. Rose and Mr. Rogers testified that numerous uncertainties exist with respect to the specifics of the carbon regulations, including stringency, timing, carbon prices, and allocation of emissions allowances. Rose, Supp. Tr. Vol. 6, p. 23; Rogers, Supp. Tr. Vol. 6, pp. 133-34. Mr. Rose, however, could not explain why the carbon tax sensitivity used in the Edwardsport analysis had carbon controls coming online in 2010, whereas under the sensitivity used in the Cliffside analysis, carbon controls would start in 2015. Supp. Tr. Vol. 6, pp. 25-26). Mr. Schlissel and Ms. Sommer testified that by pushing the starting date for the CO_2 tax five years out into the future in its carbon tax sensitivities, the Company reduced the effect of that tax on the costs of fossil-fired alternatives. Schlissel-Sommer Supplemental Testimony, p. 14. By doing so, the Company underestimated the impact of carbon regulation on the Cliffside units. This had the effect of making PC units at Cliffside look more attractive relative to other, less carbon-intensive resource options.

Although Mr. Rogers testified that Duke Energy Carolinas would be better positioned to meet the requirements of any CO_2 regulations with Cliffside than without it, Rogers Supplemental Testimony, pp. 11-12, on cross-examination Mr. Rogers admitted that "[t]he reality is we'd be better off to have no coal in terms of the CO_2 regulations." Supp. Tr. Vol. 6, p. 139. Mr. Rogers testified that any kind of carbon regulation is going to translate into higher prices for coal-fired generation, and that this would result in higher prices for customers. Supp. Tr. Vol. 6, p. 137.

In an effort to downplay the risk of investing in pulverized coal technology on the eve of federal carbon regulation, the Company seeks to assure the Commission and other parties that it can, when the time comes, simply retrofit the Cliffside units with CO_2 "scrubbers." Yet the Company's own expert witness, Judah Rose, testified that extraction of CO_2 from the flue gas stream has not been done in the power industry and that "there is no deployed technology that would be economic for the control of CO_2 from a PC plant." Supp. Tr. Vol. 6, p. 31. Similarly, Dr. Cortez testified that neither amine scrubbers nor chilled ammonia, the two "CO_2 scrubber" technologies under development, is commercially available and ready for deployment on large-scale coal plants. Supp. Tr. Vol. 1, p. 63-64. In fact, Company witness McCollum testified that chilled ammonia technology not only has not been applied to any large-scale coal plants, Supp. Tr. Vol. 2, p. 32, it is not operable at *any* coal plants, and is in fact at the pilot demonstration stage. Supp. Tr. Vol. 2, p. 34. In contrast, Mr. McCollum acknowledged that the ability to strip CO_2 out of the gasification gas stream, as would be done in carbon capture from IGCC plants, has been demonstrated. Supp. Tr. Vol. 2, p. 35. Dr. Cortez likewise testified that carbon capture technology for IGCC is operating on a commercial

scale, so there is little risk in "scaling up" the technology for use on larger plants. Supp. Tr. Vol. 1, p. 74. Dr. Cortez testified that whatever form carbon regulations may take, should a decision be made to invest in carbon capture retrofitting, it would be less costly to do so with an IGCC platform than a supercritical platform, so a utility would have greater flexibility to respond to whatever carbon policy might be enacted. Supp. Tr. Vol. 1, pp. 73-74.

Testimony from several company witnesses suggested that the Company, in fact, is placing its bets on the chance that the Cliffside units will be "grandfathered" under any federal climate legislation, and has no intention of ever installing CO_2 controls on the proposed units. Mr. Rogers admitted that Duke Energy will be lobbying for Cliffside to be "grandfathered" and issued allowances under any federal climate legislation. Supp. Tr. Vol. 6, pp. 143-44. Mr. Schlissel testified, however, that he would be "very, very surprised" if Congress enacted carbon legislation that essentially "gave a pass" to future coal plants by issuing them free CO_2 allowances. Supp. Tr. Vol. 3, p. 71. Mr. Rogers testified that at some point, when the price of allowances becomes prohibitive, the company will install carbon capture equipment. Supp. Tr. Vol. 6, pp. 147-48. Mr. Rose, however, testified that it was "extremely unlikely in [his] view and in [his] company's view . . . that there will be a situation in which there would be actual CO_2 extraction from this power plant [Cliffside]." Supp. Tr. Vol. 6 p. 30.

V. CONCLUSION

In sum, building SCPC units at Cliffside is a "lose-lose" proposition for North Carolina residents. The proposed units would be a risky investment from the perspective of the Company's ratepayers, who would be forced to shoulder a much higher cost of

compliance with mandatory federal carbon regulation for a SCPC plant than for other, less carbon-intensive technologies such as energy efficiency, IGCC or renewables. And in the event that the Cliffside units are grandfathered under federal carbon legislation, they will pump millions of tons of CO_2 into the air each year, contributing to the global warming that threatens North Carolina's fragile coastline and agricultural economy.

North Carolina has come to a crossroads. This Commission will decide whether North Carolina ratepayers—who after all will be paying for these new investments—will invest in expensive, polluting new power plants or in cleaner and less costly energy efficiency and renewable energy. Accordingly, the Commission should reject Duke Energy Carolinas' application for a certificate of public convenience and necessity to build the new Cliffside units because the Company has failed to show that the units are necessary and that they are the lowest-cost option, as required under North Carolina law.

VI. RELIEF REQUESTED

The Public Intervenors respectfully request that the Commission grant the following relief:

A. Deny the certificate with prejudice with respect to both units.

B. Without waiving our arguments to the contrary, if the Commission determines that the Company has shown a need for 800 MW of new baseload generating capacity, deny the certificate with prejudice with respect to Unit 7, and deny the certificate without prejudice with respect to Unit 6 unless and until the Applicant has submitted an amended application showing that it has complied with the following regulatory conditions:

    1. The Applicant shall retain an independent expert approved by the Commission to complete an energy efficiency potential study for its service territory, and shall file with the Commission for its approval a report documenting the methodology and results of that study, including the costs and benefits of energy efficiency measures identified by the study.

2. The Applicant shall complete the energy efficiency collaborative process that is underway and file with the Commission for its approval a report documenting the collaborative process and the results of that process.

3. The Applicant shall submit a new analysis of the need for Unit 6, taking into account the results of the energy efficiency potential study and the recommendations of the Renewable Portfolio Standard study, and shall identify measures to be implemented as a result of the studies and process discussed in paragraphs 1 and 2. A resource supply curve shall be included to show a comparison of the levelized cost of the proposed energy efficiency, renewable energy and Cliffside Unit 6 investments.

4. The Applicant shall propose, for approval by the Commission, a schedule to retire older units in its service territory such that with the excess generation capacity available from the addition of Unit 6, the company achieves a net reduction in the total emissions of carbon dioxide across its service territory, including Cliffside Units 1-4.

5. The Applicant shall analyze thoroughly the potential generating capacity it could obtain from a renewable portfolio standard in light of the findings of the Renewable Portfolio Standard Study convened by the Commission, and shall proceed to incorporate renewable energy resources into its portfolio in a manner consistent with those findings.

6. The Applicant shall conduct a new analysis comparing the long-term costs of building and operating a pulverized coal unit with the long-term costs of building and operating a similarly sized IGCC unit, taking carbon risk into account using a range of carbon price sensitivities beginning in 2010.

7. The Applicant shall obtain all necessary environmental permits.

C. Without waiving our arguments to the contrary, if the Commission determines to grant the certificate for 1600 MW, on the basis of the Company's plan to sell 800 MW of the capacity under a shared ownership agreement, deny the certificate without prejudice with respect to both units unless and until the Applicant has submitted an amended application showing that it has complied with regulatory conditions 1-7 above, and require the Company and the party seeking joint ownership to file jointly with the Commission a new application for a certificate of public convenience and necessity, showing that both proposed 800 MW units would serve the public convenience and necessity of the customers in their combined service areas. In addition, hold public and evidentiary hearings, and receive full briefing and argument, on the new application.

D. Allow all intervenors the opportunity to comment on the subsequent filings in this

docket, including the Applicant's submissions pursuant to paragraphs 1-7 above, and to request additional public and/or evidentiary hearings on issues raised by those submissions.

E. Grant such other relief as the Commission deems just and proper.

Respectfully submitted, this 7th day of February, 2007.

Marily Nixon
Gudrun Thompson
Southern Environmental Law Center
200 W. Franklin St, Ste 330
Chapel Hill, NC 27516
Tel.: 919-967-1450
Fax: 919-929-9421
Attorneys for Environmental Defense and Southern Environmental Law Center

Gary A. Davis
Gary A. Davis & Associates
P.O. Box 649
Hot Springs, NC 28743
Tel.: 828-622-0044
Fax.: 828-622-7610
Attorney for Southern Alliance for Clean Energy

T. LaFontine Odom, Sr.
The Odom Firm, PLLC
1109 Greenwood Cliff
Charlotte, NC 28204
Tel.: 704-377-7333
Fax: 704-377-5747
Attorney for N.C. Sustainable Energy Association

John D. Runkle
Attorney at Law
P.O. Box 3793
Chapel Hill, N.C. 27515
Tel. & Fax: 919-942-0600
Attorney for N.C. Waste Awareness and Reduction Network

CERTIFICATE OF SERVICE

I hereby certify that the following have been served this JOINT BRIEF AND PROPOSED FINDINGS OF THE PUBLIC INTERVENORS by deposit in the U.S. Mail, postage prepaid, or by electronic mail:

Len S. Anthony
Kendal C. Bowman
Progress Energy Services, Inc.
P.O. Box 1551/PEB 17A4
Raleigh, NC 27602

Michael S. Colo
Poyner & Spruill LLP
PO Box 353
Rocky Mount, NC 27802-0353

Wells Eddleman
811 Yancey Street
Durham, NC 27701-3151

Kodwo Ghartey-Tagoe
Lara Nichols
The Company Power Corporation
422 S. Church Street, PB05E
Charlotte, NC 28202

Leonard G. Green
N.C. Department of Justice
Post Office Box 629
Raleigh, North Carolina 27602-0629

Kevin C. Greene
Brandon F. Marzo
Troutman Sanders LLP
Bank of America Plaza, Suite 5200
600 Peachtree Street, N.E.
Atlanta, GA 30308-2216

Robert W. Kaylor
The Kaylor Law Firm
225 Hillsborough Street, Suite 480
Raleigh, NC 27603

Sharon Miller
Carolina Utility Customer Association, Inc.
Trawick Professional Center, Suite 210
1708 Trawick Road
Raleigh, NC 27604

Ralph McDonald
Bailey & Dixon
Post Office Box 1351
Raleigh, NC 27602-1351

Pamela A. Scott
Poyner & Spruill LLP
PO Box 10096
Raleigh, NC 27605-0096

Lawrence B. Somers
The Company Power Corporation
PO Box 1006, EC03T
Charlotte, NC 28201-1006

James P. West
West Law Offices, P.C.
Suite 2325, Two Hannover Square
434 Fayetteville Street Mall
Raleigh, NC 27601

Antoinette Wike
NCUC- Public Staff
4326 Mail Service Center
Raleigh, NC 27699-4326

This _____ day of February, 2007.

Gudrun Thompson
Attorney at Law