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JUN 10 2010
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June 9, 2010

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Renne C. Vance
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Re: Docket No. E-100, Sub 124

Dear Ms. Vance:

Please find for filing the original and 30 copies of the BRIEF OF NC WARN, along with a CD of the brief in different formats. I am submitting an additional copy to be stamped "filed" and returned to me in the enclosed envelope.

Thank you for your attention to this matter.

Sincerely,



John D. Runkle
Counsel for NC WARN

cc. Service List – via email

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STATE OF NORTH CAROLINA
UTILITIES COMMISSION
DOCKET NO. E-100, SUB 124

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JUN 10 2010

Clerk's Office
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BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

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In the Matter of
Investigation of the Integrated Resource
Plan in North Carolina for 2009

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BRIEF OF NC WARN

NOW COMES the North Carolina Waste Awareness and Reduction Network, Inc. ("NC WARN"), through the undersigned attorney, with a brief addressing the integrated resources plans ("IRPs") submitted by Duke Energy and Progress Energy in this docket. NC WARN relies on the other parties to submit proposed orders containing the *necessary findings and conclusions*.

Introduction.

1. This brief primarily reviews the testimony and exhibits of NC WARN's expert witness, Dr. Blackburn, Professor Emeritus of Economics, Duke University. His testimony, summary and cross examination are in Transcript, Vol. 2, pages 79 - 124. The studies and analyses attached as exhibits to his direct testimony address energy policy for North Carolina in general, and specifically how the utilities must respond in their IRPs to major changes in our economy and our energy use.

2. As a basic premise, significantly all of the coal plants in the Duke Energy and Progress Energy generation mix can be phased out over the IRP planning horizon without the need for new nuclear units through the three prongs of energy efficiency, renewable energy sources and customer cogeneration. As shown below, the present

IRPs of Duke Energy and Progress are flawed as they continue the *status quo* rather than use practical and cost-effective measures to plan for the future. The result is a reliance on new and costly baseload plants that will cause electricity bills to increase dramatically over the next decade.

Scope of Commission review.

3. The development of energy efficiency and renewable energy sources has increased as a significant component of State policy as evidenced in the Renewable Energy and Energy Efficiency Portfolio Standards ("REPS"), pursuant to the provisions of Session Law 2007-397 (also referred to as "Senate Bill 3"). As a result of our State's increased reliance on energy efficiency and renewable energy sources to meet future growth in electricity demand, there is a concomitant impetus to reduce the dependence on costly power plants. The issue directly before the Commission in the present IRP hearing is whether to accept multibillion dollar new plant construction or proceed with the timely retirement of existing coal-fired power plants.

4. The Commission's role in addressing the costs and benefits of generation and of energy efficiency and renewable energy programs is clear. G.S. 62-2(3a) states that the policy of the State is to find 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." (emphasis added). In addition to approving the best mix of generation, efficiency and renewable energy sources, G.S.62-110.1(c) requires the Commission to keep current an analysis of the long-range needs for expansion of facilities for the generation of electricity in

North Carolina. By rule, the Commission requires the electric utilities to file reports with their forecasts of peak demand growth and how the utility is planning to meet that growth. NCUC Rule 8-60. It is evident that the Commission has determined that the IRP process and biennial review of load forecasts are of primary importance in carrying out the State policy. It is therefore important for the Commission to cast a critical eye on what is presented to it in order to determine the "least cost mix."

5. In his testimony, Dr. Blackburn questioned the growth projections of the utilities, finding no basis for the ambitious projections, stating

I believe that electricity demand is likely to grow more slowly than the two utilities project, since carrying out the construction programs in the IRP filings will necessarily raise rates to customers. I invite the Commission to review Duke Energy's recent estimate of NC retail sales in its rate increase filing, Docket E-7, Sub 909, showing flat sales for the 2009 - 2014 period. Exhibit 4. This is apparently without any effects of the present recession.

Blackburn Prefiled Testimony, page 3. Even a fraction of a percentage point in a growth forecast accumulates considerably over the IRP planning horizon, inaccurately leading to a false conclusion that significant growth in electricity demand is inevitable.

6. The fundamental problem with planning based on ambitious growth projections is that it necessitates costly new baseload power plants to meet the projected demand. Relevant to the IRPs again this year, case law points out that the purpose of the IRP statute, G.S. 62-110.1, is to prevent costly overbuilding. *State ex. rel Utils. Comm'n v. High Rock Lake Ass'n*, 37 NC App. 138, 245 S.E.2d 787, cert. denied, 295 N.C. 646, 248 S.E.2d 257 (1978). The proscription against overbuilding new plants is of primary importance in the 2009 IRPs as Duke Energy and Progress Energy continue to propose new, and expensive, baseload plants, even though as

Blackburn Exhibit 4 demonstrates, the actual growth in sales for Duke Energy, for one, is flat and even projected to decline over the next six years.

7. The lens through which the Commission should review the utilities' load forecasts should reflect State policy – with its emphasis on a diversified mix of energy resources centered on what is found here in our State. This means both that energy efficiency measures must be seriously incorporated into the utilities' long-term planning in order to reduce load growth and that renewable energy resources should be developed to meet generation needs. Otherwise, the ratepayers in North Carolina will bear the burden of paying for the new plants proposed by the utilities to meet their projected increase in demand, as well as the risks of the new plants in terms of *escalating costs, delay and abandonment*.

Comments on the IRPs.

8. One of the most significant changes between the 2008 and 2009 IRPs and previous ones is the treatment of coal plants, especially those smaller and older units with only minimal air pollution controls. Both Duke Energy and Progress Energy have proposed major shifts in their use of coal plants, partly because of uncertainties in the costs of coal and partly because of potential Federal carbon control schemes, such as a cap-and-trade program for carbon dioxide equivalent and carbon taxes. New coal plants, as evidenced by the public opposition to Duke Energy's Cliffside Unit 6, are controversial and increasingly seen as an untenable option in a time of concerns about global climate change.

9. In its 2009 IRP, page 42, Duke Energy lists the 18 coal plants that it is

planning on retiring by 2020. These plants have a capacity of 1504 MW, although they only generate approximately 3.5 million mWh annually.¹ In addition to the stated cancellations, Duke Energy has regulatory requirements pursuant to the certificate of public convenience and necessity issued by the Commission in Docket E-7, Sub 790, to retire Cliffside Units 1-4 and retire other units equivalent to Cliffside 6 on a MW for MW basis. Pursuant to conditions in the air quality permit for Cliffside 6, Duke Energy is required to retire other coal units on a mWh for mWh basis. Although these two requirements would only come into effect if Cliffside 6 goes into operation, they should be incorporated into the 2009 IRP.

10. Similarly, Progress Energy, less in its IRP than in other dockets, has described the *number of smaller and older coal plants that it is retiring or converting to natural gas*. Docket E-2, Sub 960 lists 12 coal plants without flue gas desulfurization, a pollution control system required under the N.C. Clean Smokestacks Act, Session Law 2002-4. These plants have a capacity of 1,659 MW; Docket E-2, Sub 943 shows that these plants generate approximately 7.4 million mWh annually. Tr. Vol. 2, pages 103 - 109. Progress Energy is retiring all of these plants or replacing some plants, most notably plants at Sutton and in Wayne County, with combined cycle natural gas plants. As testified to by Progress Energy Witness Snider, Progress Energy's 2009 IRP does not reflect its current plans to retire these different coal plants. Tr. Vol. 1, page 109.

11. The other baseline additions in the IRPs are the four nuclear units proposed for North and South Carolina. Duke Energy is proposing two units at the Lee Station in

¹ See Docket E-7, Sub 876 and similar monthly reports on power plant performance.

Gaffney, South Carolina, and Progress Energy, two units at the Shearon Harris site in Wake County. The cost of each new nuclear unit is now in the \$10 -12 billion range and if the utilities continue to go ahead with those plants, electricity bills will go up considerably over the next decade. Blackburn, Exhibit 2, page 4. These large nuclear units, each more than 1050 MW, would require large reserve capacity in case they are out of operation, increasing the costs even more. The construction and operation of these new baseload plants are risky in terms of the costs to the ratepayers and taxpayers, as well to the overall economy of North Carolina.

12. Rather than proceed with limited coal plant cancellations and the costly nuclear units, there are other valid, cost-effective scenarios that meet the needs of all consumers in North Carolina rather than the *status quo* scenarios offered in the IRPs. In his testimony, Dr. Blackburn described a coal phase out plan, the core features of which

are aggressive programs to increase energy efficiency at customer locations and a renewable energy build-up to 20% of total sales, including both retail and wholesale sales in North Carolina. I also recommend the development of substantial cogeneration (combined heat and power) facilities for commercial and industrial customers who use both heat and electricity in their facilities.

Blackburn Prefiled Testimony, pages 4 - 5. Dr. Blackburn then described the state of the various technologies and programs and demonstrates that the energy efficiency at 20% of current sales, an equivalent growth of renewable energy sources, including solar photovoltaics (PV), wind and solar hot water and other solar thermal technologies, along with a significant growth of customer cogeneration will eliminate the need for the coal plants, without requiring additional nuclear baseload units. Dr. Blackburn further

testified that combined these initiatives have both baseload and peaking characteristics that reflect the present utility load curves.

14. In addition to reducing the need for new power plants, the savings associated with following Dr. Blackburn's recommendations are considerable. Although there are additional costs for a much larger energy efficiency program, the average cost of the energy efficiency programs is approximately 4 - 5 cents per kWh. The average costs of renewables are approximately 9 -10 cents per kWh generated, with solar photovoltaics, i.e., solar PV, as high as 18 cents per kWh. Customer cogeneration as its average costs are approximately 6 - 7 cents per kWh. As Dr. Blackburn summarized his testimony, "we are spared the 13 -18 cents per kWh costs of nuclear electricity and the avoidance of yet more nuclear waste. Without the coal plants, we will not have to bear the economic, environmental health costs of generating coal-based electricity." Again, the least cost mix analysis requires that costs are incorporated in the Commission's determination of the sufficiency of the IRPs.

15. Dr. Blackburn based his expert opinion in part on the two reports attached to his testimony, *North Carolina's Energy Future*, and *North Carolina's Energy Future 2010: Phasing out the Generation of Electricity by Coal*, and the Commission dockets and reports cited therein. Blackburn Exhibits 2 and 3. In the first study, Exhibit 2, Dr. Blackburn accepted the growth projections and professed reserve margins in the Duke Energy and Progress Energy IRPs. In the tables starting on page 13, he took the figures in the IRPs and then makes reasonable and cost-effective adjustments to demonstrate that to a great extent, no new plants are needed. As presented in detail in the report, this is done through increasing energy efficiency measures by 1% each year,

utilizing the renewable energy resources required under the REPS provisions, modestly increasing load control programs and adding some cogeneration (referred to as "combined heat and power"). This scenario also eliminates wholesale sales outside of the utility service areas and retains existing purchase contracts from other utilities or merchant plants. The chart on page 3 of the report further shows the results of Dr. Blackburn's adjustments, which in addition to no new plants being needed, under one of Duke Energy's scenarios and that of Progress Energy, 3700 MW of existing plants can be retired within 15 years.

16. In the second report, Exhibit 3, Dr. Blackburn assessed whether it was practical to eliminate all coal plants from the generation mix, again using the utility figures and growth projections. Blackburn Exhibit 3. As shown in the tables on pages 5 - 8, and visually demonstrated in the graphs as part of his summary testimony, Dr. Blackburn's conclusion is that with the three prongs of energy efficiency, renewable energy and customer cogeneration a significant number of the existing coal plants in the Duke Energy and Progress Energy service areas do not have to be used. Most, if not all of the plants can be retired over the IRP planning horizon of 15 to 20 years.

17. To provide a visual depictions of the various forecasts of energy efficiency, Attachment 1 to this brief compares energy requirements and forecasts as a percentage of savings by 2025. It begins with the REPS requirement in Senate Bill 3, which can be met with up to 5% of retail sales from energy efficiency measures.² As shown in the graph, the amounts of energy efficiency relied upon in the IRPs do not

² See Attachment 1, Notes, for further descriptions of the various REPS requirements and forecasts.

even meet the REPS standard, although the utilities maintain that they will meet the REPS requirement although have not finalized the energy efficiency programs that they will use to meet REPS.

18. It is apparent from the evidence in the record that Duke Energy and Progress Energy incorporated into their IRPs only the minimal amount of energy efficiency required under the REPs, rather than what was practical. Progress Energy witness Edge, responded to the question on cross-examination, "Is it inconceivable to have a one percent savings per year over the planning horizon for Progress Energy?" with "Based on our analysis, yes, we think it's inconceivable." Tr. Vol. 1, page 122.

19. What is troubling about Duke Energy's IRP is that Duke Energy's planning does not appear to be based on its efficiency goals approved in the Save-A-Watt docket, a savings of 2% for the first four years as the program ramps up, and then an annual savings of 1%. The Duke Energy IRP at page 50 briefly describes the Save-a-Watt commitment and Duke Energy witness Stevie characterized this as the "high case" scenario. Tr. Vol. 2, page 10. At the same time, Dr. Stevie would not endorse the high case Save-a-Watt scenario for planning purposes even though Duke Energy witness McMurry characterized it as "cost effective." Tr. Vol. 2, pages 21 - 22. Duke Energy witness McMurry also stated that Duke Energy was not willing to commit to the long-term goals of its approved Save-a-Watt program. Tr. Vol. 4, page 110. As shown below, this goal still achieves far less in savings than is realistically and economically feasible, but even a 1% annual savings makes a significant difference over the next several years, not only are the two proposed nuclear units not required, Duke Energy can begin with eliminating more coal plants.

20. The graph in Attachment 1 then compares a few of the more recent studies of the marketable potential for energy efficiency with what is in the IRPs. The more recent studies, those by Dr. Blackburn and the American Council for an Energy Efficient Economy (ACEEE), use a reasonable annual saving in the 1.5% range. These forecasts are in line with the recommended achievable goal by SELC witness Wilson for a minimum of a 15% savings over the IRP planning horizon. Wilson Prefiled Testimony, page 28. As noted by Dr. Blackburn in his testimony, in light of the various programs in other states, a 1.5% savings is both "doable and cost effective." Blackburn Prefiled Testimony, page 6. At this level, accompanied by increased renewable energy and cogeneration, almost all of the coal plants by both utilities can be eliminated over the planning horizon, even after starting with the utilities high growth forecasts and keeping high reserve capacity intact.

21. In criticizing Dr. Blackburn's forecast of increased energy efficiency, the utility witnesses confounded what the utilities were willing to do with what could be done. It appears that from the utility point of view, if it does not control the program, measure the actual savings and take credit for the savings in their accounting, the energy saved does not need to be accounted for. As Duke Energy witness Steve stated, "the projections of energy efficiency that were included in the IRP are for the Save-a-Watt programs that Duke is operating" and apparently, nothing else. Tr. Vol. 3, page 28. Duke Energy witness McMurry stated that the market potential study used as a screen is limited to utility-controlled programs. Tr. Vol. 5, page 115. As another example, Progress Energy witness Edge state that Progress Energy did not include the impacts of residential solar hot water in its forecasts of energy efficiency unless it was

part of a Progress Energy-approved program. Tr. Vol. 5, page 54.

22. The artificial constraints to the utilities' planning are in direct contrast with Dr. Blackburn's position. Dr. Blackburn described his recommendation of a 1.5% annual savings as "It's anything that anybody does to reduce electricity demand to a point lower than it would have been without that action." Tr. Vol. 2, page 121. Regardless of the source of energy efficiency, the savings should be included in the forecasts at realistic levels. It makes no difference to the down sloping growth curve in the forecasted demand whether the savings come from a utility rebate program, Federal appliance standards or a third-party weatherization program.

23. Progress Energy witness Edge's criticism of the 1.5 - 2.0% savings in the ACEEE study was that it was not a utility market potential study. Tr. Vol. 1, pages 122, 159. Several of the utility witnesses questioned the recommendations of the study as it relied in part upon actions outside of the control of the utilities, such as a Federal appliance efficiency standard, or it recommended programs conducted successively in other states, but which the North Carolina utilities had not adopted yet.

24. In describing future energy savings, neither Duke Energy nor Progress Energy included the impacts on growth of "free riders." As defined in the La Capra study,³ page 49, free riders are:

participants in an energy efficiency program who would have undertaken the energy efficiency measure or improvement in the absence of a program or in the absence of a monetary incentive. Free-drivers are those who adopt an energy efficient product or service because of the

³ La Capra Associates, "Analysis of Renewable Portfolio standards for the State of North Carolina: Technical Report Prepared for North Carolina Commission," December 2006.

intervention, but are difficult to identify either because they do not collect an incentive or they do not remember or are not aware of exposure to the intervention.

Regardless of whether a person is classed as free rider under a utility-sponsored program or not, the energy saved by that person still needs to be analyzed and used to reduce the total demand forecasts in the IRPs.

25. The IRPs additionally do not reflect those who would adopt the energy efficiency measure regardless of any utility-sponsored energy efficiency program, or "intervention" as used in the La Capra definition above. These "non-utility adopters" range from households who have purchased energy-efficient compact fluorescent light bulbs or replaced appliances and HVAC systems for more efficient models or replaced windows with insulated glass. Large commercial entities such as Wal-Mart have undertaken cost saving in new and existing stores; Food Lion's cogeneration initiatives in eastern North Carolina are worth noting. Many industrial customers have replaced turbines and other equipment, saving energy dollars and making them more competitive economically. Some of these non-utility adopters are free riders on utility programs, or take advantage of Federal and state tax credits, or simply adopt the energy measures because it makes economic or environment sense to them. What is important about them is that their actions are often out of the control of the utilities; they participate in non-utility programs, or save energy in ways that the utilities are unable or unwilling to sponsor.

26. One of the most underutilized sources of electricity, in terms of generation of new electricity and reducing demand through energy savings, is customer cogeneration, referred to as combine heat and power. Dr. Blackburn testified that "North Carolina

already has about 1500 MW of combined heat and power (CHP) facilities, all but one in industrial settings. These facilities, at most, contribute 7 or 8 billion kWh, around 5% of North Carolina's electricity." Blackburn Prefiled Testimony, page 7. The studies by the Oak Ridge National Laboratory show that a 20% level is both technically and economically feasible, resulting in more 3,000 MW of potential cogeneration in both North and South Carolina. Although Progress Energy includes some existing cogeneration in its IRP, the realistic addition of more by both utilities of cogeneration, especially for large commercial and institutional building, will be a significant contribution to the phase out of coal plants.

27. The projections for the utilization of solar energy in the IRPs simply reflect the "solar set aside" in Senate Bill 3, i.e., that portion of the REPS that is required to be filled by solar energy projects, and nothing more. G.S. 62-133.8(d) requires that a minimum of 0.2% of total generation sold to retail customers in the State shall be from new solar electric facilities or new metered solar thermal. To meet this requirement, both Duke Energy and Progress Energy developed requests for proposals and although there were a significant number of proposals for solar capacity, there has been little or no purchase of these resources by the utilities. Tr. Vol. 1, pages 162 -165; Tr. Vol. 2, page 44.

28. It is readily apparent that rather than treat solar energy or the other renewable energy resources as a part of the least cost mix; the utilities seem only willing to contract for solar capacity at the set aside level. In essence, the Senate Bill 3 minimum has become the *de facto* ceiling. Progress Energy has already maxed out on the solar set aside and is banking credits for future years. As stated by Progress

Energy witness Fonvielle, "we don't foresee any problems meeting our solar requirements nor our overall general requirements that begin in 2012." Tr. Vol. 1, page 146. In his exhibit 7, Mr. Fonvielle demonstrated that Progress Energy had accumulated enough renewable energy credits ("RECs") through 2012 and needed very little additional purchases for 2013. Similarly, Duke Energy only entered into a few power purchase agreements for renewable energy in response to its RFPs. Tr. Vol. 2, page 44. As Duke Energy witness Stevie described, Duke Energy has also accumulated both instate and out-of-state RECs to use over the next several years, with little need for additional renewable energy purchases.

29. Given the tangible deficiencies in incorporating energy efficiency, renewable energy and cogeneration into their forecasts, it is not reasonable to allow the 2008 and 2009 IRPs to provide the basis for new generation plants, and in particular, new baseload units. Later this year, the utilities will submit expanded IRPs and because of the uncertainties of carbon control initiatives, increasing costs of nuclear plants and increasing fuel costs, the 2010 IRPs should be significantly different. At a minimum, any approval of the IRPs should directly acknowledge the deficiencies and be limited to a fairly restricted time period.

30. NC WARN strongly recommends that the Commission include in its order a recognition of the expectation that the 2010 IRPs should include scenarios for energy efficiency, renewable energy and cogeneration that are not just limited to what the utilities are willing to undertake, but what is practical and available. The REPS mandates cannot be the absolute limit of what the utilities incorporate into their planning. The test is what is the "least cost mix"; the forecasts should not be limited

only to energy savings under the Duke Energy Save-a-Watt and Progress Energy DSM/EE Rider programs. The contribution to energy savings by projected future programs, free riders and the non-utility adopters should be incorporated into real least cost planning. Simply put, efficiency measures will happen outside of the control of the utilities, and they need to plan for it.

Conclusion.

31. Through the testimony and exhibits of Dr. Blackburn and other evidence in the record, NC WARN demonstrated that in their load forecasts and annual plans, the electric utilities are continuing to propose costly and unneeded power plants despite a flat growth forecast and underutilized reliance on the three prongs of energy efficiency measures, renewable energy sources and cogeneration. As described by Dr. Blackburn in his testimony and attached reports, it is not only possible, but "doable and cost effective" to eliminate most of the coal plants without building new nuclear units.

32. The Commission's responsibility is clear in seeking the "least cost mix" of generation and energy efficiency; the mix focuses on energy efficiency and renewable energy sources and away from "costly overbuilding." The Commission should determine that not only are no new baseload generating units are needed, existing coal plants can be phased out in a timely manner.

Respectfully submitted, this the 9th day of June 2010.

A handwritten signature in black ink, appearing to read "John D. Runkle". The signature is written in a cursive style with a horizontal line underneath it.

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CERTIFICATE OF SERVICE

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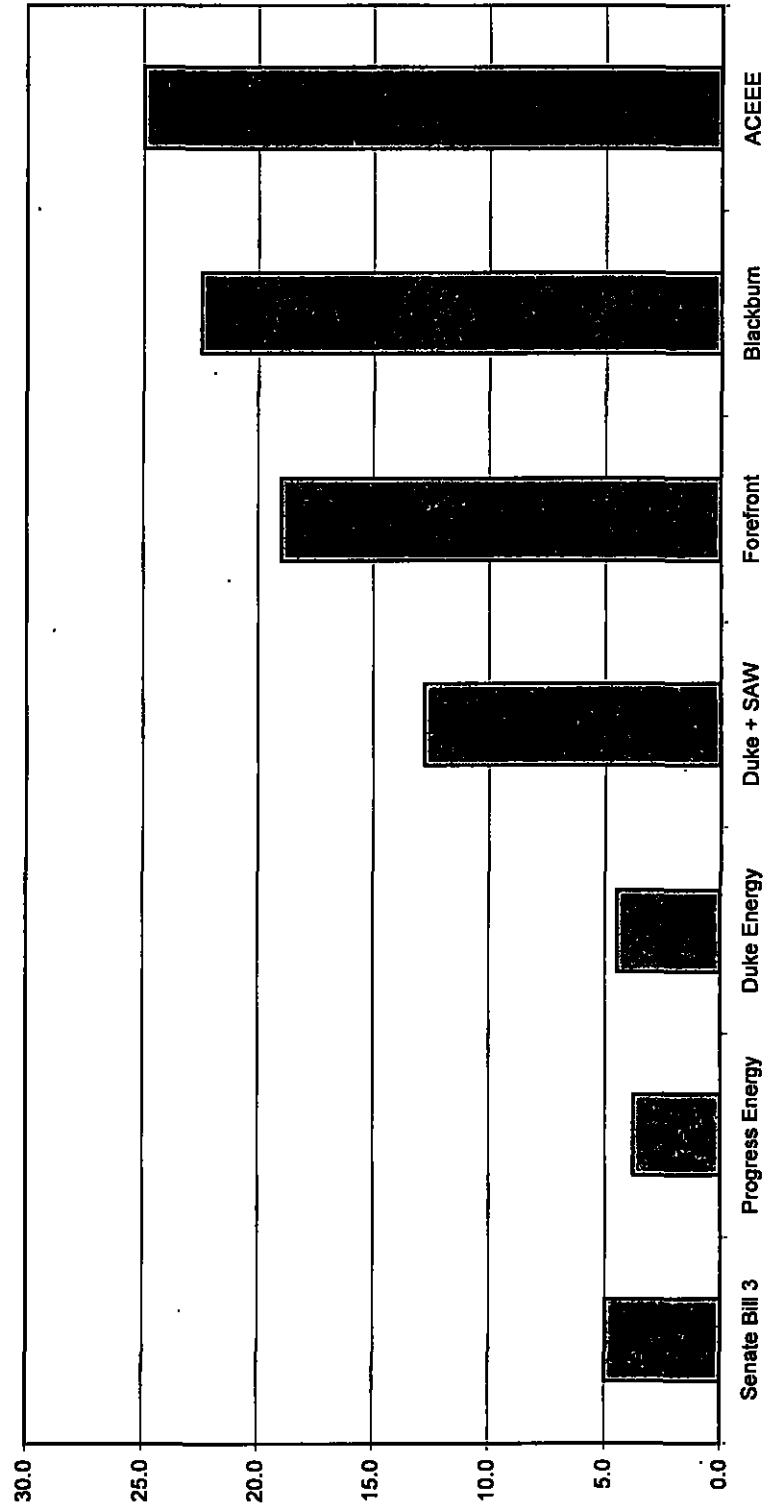
This is the 9th day of June 2010.



Attorney at Law

FORECASTS OF ENERGY EFFICIENCY % SAVINGS BY 2025

ATTACHMENT 1



NOTES TO ATTACHMENT 1

1. Session Law 2007-397 (Senate Bill 3) established a Renewable Energy and Energy Efficiency Standard (REPS) requirement of 12.5% of retail sales, with up to 25% of the REPS by energy efficiency (EE) until 2020; beginning in 2021, the EE allowance is 40%. G.S. 62-133.7(b). Wholesale customers, such as the electrical membership cooperatives and municipalities, have a 10% REPS of which 30% may be from EE. G.S. 62-133.7(c). Note that these are the maximum percentages allowed to meet REPS; SB 3 does not place any limits on EE.

2. The forecasts by Progress Energy and Duke Energy are those included in the 2008 and 2009 IRPs. In its IRP, Duke's forecast goes out to 2029 so it is proportionately backed down to 2025. Both utilities state that they will achieve the REPS although have not finalized their EE programs. See Progress Energy witness Edge, Tr. Vol. 1, pages 158 - 159; Duke Energy witness Stevie, Tr. Vol. 2, page 7.

3. The column marked "Duke + SAW" includes Duke Energy's forecast in its IRP, and the commitment for an annual 1% savings beginning in 2015 made by Duke Energy for its Save-a-Watt program approved in NCUC Docket E-7, Sub 831. Duke IRP, page 50, references the SAW commitment as the "high case" scenario.

4. The Forefront study, Forefront Economics, Inc., and others, "Duke Energy Carolina DSM Action Plan: North Carolina Report," was commissioned by Duke Energy to determine marketable EE; available in NCUC Docket No. E-7, Sub 831 (Save-a-Watt), Exhibit 1 to Testimony, Duke witness Stevie, filed April 4, 2008. Referenced in Blackburn Exhibit 3, footnote 24.

5. Other studies not included are the La Capra Associates, "Analysis of Renewable Portfolio standards for the State of North Carolina: Technical Report Prepared for North Carolina Commission," December 2006; and GDS Associates, "Achievable Electricity Savings Potential for the State of North Carolina," October 20, 2006. Both are available at www.ncuc.net/reps/reps.htm and further referenced in Blackburn Exhibit 3, footnotes 25 and 25.

6. The basis for Dr. Blackburn's forecast is included in his testimony and exhibits.

7. The study by the American Council for an Energy Efficient Economy (ACEEE) is "North Carolina's Energy Future: Electricity, Water and Transportation Efficiency," March 18, 2010. Referenced in Blackburn, Exhibit 4, page 3. It was discussed by several witnesses, including Public Staff witness Floyd, Tr. Vol. 3, p. 28 and Progress Energy witness Edge, Tr. Vol. 1, page 120.