

1 A. The purpose of my testimony is to let the Commission know that Duke Energy Carolinas
2 continues to support its application for a Certificate of Public Convenience and Necessity
3 (“CPCN”) to construct two 800 MW state-of-the art pulverized coal generating units at
4 the Company’s existing Cliffside Steam Station (the “Cliffside Project”), even though the
5 estimated cost of the project has increased substantially from the time we originally filed
6 our CPCN application. My supplemental testimony explains why we still believe the
7 Cliffside Project is a prudent addition to our resource portfolio and therefore consistent
8 with the public convenience and necessity. My testimony also outlines what actions we
9 are taking to mitigate the impact of increasing new generation costs for our customers
10 and our shareholders.

11 Q. PLEASE BRIEFLY SUMMARIZE YOUR SUPPLEMENTAL TESTIMONY.

12 A. In my judgment, the Cliffside Project is the best option to reliably and cost-effectively
13 meet Duke Energy Carolinas’ customer needs over the long term. In reaching this
14 conclusion, I have considered the fact that due to growth in demand for electricity here in
15 the Carolinas, over just the next fifteen years, Duke Energy Carolinas will need to grow
16 its generation fleet by approximately one-third. How to best meet that demand is made
17 more complex by many future uncertainties. Among them: Which fuel will be the best
18 choice to ensure low, stable prices for our customers? What new environmental
19 regulations will be enacted? Will new nuclear plants be built on schedule? What will be
20 necessary to jump-start energy efficiency to make it a meaningful “fifth fuel”? Because
21 of the complexity of this decision, and because there is no simple deterministic solution, I
22 believe we need to face the future with a plan that addresses our customers’ needs,
23 reduces carbon intensity, improves our system environmental footprint, and offers a

1 meaningful energy efficiency platform. The addition of the state of the art Cliffside
2 Project is central to that plan.

3 The estimated cost of the Cliffside Project has increased since we first filed our
4 CPCN application. If we were to look only at the impact on our integrated resource
5 planning model's base case analysis, we might simply conclude that the Cliffside Project
6 is no longer the preferred option. When a variety of sensitivities and scenarios are
7 considered in the model, however, the Cliffside option continues to be least cost over a
8 number of those sensitivities and scenarios. In any case, the model is an input for
9 decision-making. As utility management, we do not make decisions in a vacuum, nor do
10 we simply take the output of a model run and implement it without exercising our
11 judgment. In our judgment, our customers' long-term resource needs—and the public
12 convenience and necessity—are best served by going forward with the Cliffside Project.

13 Notably, a decision *not* to move forward with the Cliffside Project is a decision *to*
14 *move forward* with something else. The demand for electricity is there, and must be met.
15 I believe that choosing something other than the Cliffside Project subjects our customers
16 and our Company to unreasonable levels of risk – such as not having timely access to
17 reliable capacity, or being unduly exposed to fuel price volatility. Given the many
18 uncertainties facing customers, our Company, and this Commission, it is more important
19 than ever that we analyze the robustness of our resource plans across many differing
20 scenarios, and that we pursue a diverse, yet stable, portfolio of resources to meet our
21 customers' demands for electricity.

1 As Company witness Janice Hager explains in her supplemental testimony, our
2 updated IRP analysis considers a number of sensitivity and scenario analyses, and reveals
3 the following important conclusions:

- 4 • A portfolio that includes only gas and nuclear performs well under base case
5 assumptions, but such a resource plan is more risky and less robust than the balanced
6 plan that includes the Cliffside Project, new nuclear and new gas ;
7
- 8 • The Cliffside Project is a good hedge against natural gas price volatility;
9
- 10 • The Cliffside Project is a good hedge against the potential inability to construct new
11 nuclear plants during the near-term;
12
- 13 • Partial (50%) ownership of the Cliffside Project is economically efficient, and a plan
14 that includes 50% of Cliffside is essentially equivalent in cost to a “least cost” only
15 gas and nuclear plan.
16

17 Thus, though the cost of power plant construction is going up, we view the
18 Cliffside Project as relatively low cost insurance against a number of future contingencies
19 and uncertainties – particularly it will provide protection against undue reliance on gas
20 generation and its historic fuel price volatility and protection against the unavailability of
21 new nuclear generation. In addition, we are committed to exploring ways to mitigate the
22 impact of rising power plant costs on consumers, including: joint ownership of the
23 Cliffside Project; new options to reduce the burden of generation financing costs; and
24 increased focus on energy efficiency programs that give customers enhanced ability to
25 control their energy use and, consequently, their energy costs. As I discuss in greater
26 detail later in my testimony, as part of our plans for the Cliffside Project, absent
27 compelling customer or system reliability needs and assuming appropriate regulatory
28 treatment, Duke Energy Carolinas is willing to commit to the following: to invest one
29 percent of annual Company revenues in energy efficiency programs and to retire

1 additional older, less efficient coal units over time in amounts equivalent to the realized
2 new energy efficiency program megawatt savings. The Cliffside Project is a critically
3 important part of a comprehensive plan to provide Duke Energy Carolinas' customers
4 with reliable power at reasonable and stable prices over the long-term, while improving
5 our environmental footprint and addressing the uncertainties I described above.

6 Q. WHAT IS THE CURRENT ESTIMATED COST FOR THE CLIFFSIDE PROJECT?

7 A. Our current estimate for the cost of the 1600 MW Cliffside Project is approximately \$3.0
8 billion. This represents an approximate forty percent increase in the estimated project
9 cost since our initial CPCN application to the Commission. As the supplemental
10 testimony of Duke Energy Carolinas witnesses Judah Rose and Bill McCollum discuss in
11 further detail, these escalating costs stem primarily from the increased costs of
12 commodities that drive the costs of major equipment items, as well as rising skilled labor
13 rates. Notably, these escalating costs will also increase the construction costs of other
14 baseload alternatives, such as IGCC, nuclear, and combined-cycle generation. As Mr.
15 Rose makes clear, rising prices for major power plant projects is a global trend, driven by
16 global demand.

17 Q. HOW DOES THIS CLIFFSIDE PROJECT COST INCREASE IMPACT THE COST-
18 EFFECTIVENESS OF THE PROJECT?

19 A. I believe that although the cost of the project has increased, it is still cost-effective. As
20 Ms. Hager explains in greater detail in her testimony, our updated integrated resource
21 planning model results indicate that the present value revenue requirements of the
22 balanced portfolio reflecting full ownership of the Cliffside Project (in addition to 1734
23 MW of new nuclear capacity and 2711 MW of new gas capacity) are estimated to be

1 approximately \$230,000,000 more than the all-gas and nuclear portfolio over the 35-year
2 study period. While that is not an insignificant amount, it is important to keep in mind
3 that this figure is less than one-half of one percent (0.5%) of the total present value of
4 Duke Energy Carolinas' resource planning revenue requirements, which translates to an
5 average retail rate impact of less than one-half of one percent (0.5%) each year over the
6 study period. Moreover, as Ms. Hager will explain, the 100% Cliffside portfolio remains
7 the least cost resource alternative in five of the sensitivities analyzed. And a portfolio
8 including 50% ownership of the Cliffside Project is comparable in cost to the "all-gas and
9 nuclear" alternative plan.

10 When all risks are considered across the broad spectrum of future operating
11 scenarios, I believe that pursuing the Cliffside Project – either by ourselves or with a joint
12 owner -- is the best-cost option for our customers, and potentially beneficial for the
13 region as a whole.

14 Q. WHAT, IN YOUR VIEW, IS THE ROLE OF THE IRP MODEL IN THE DECISION-
15 MAKING PROCESS?

16 A. IRP models are tools used to inform management judgment. Our model is sound. But,
17 we must recognize the inherent limitations of such models. Our IRP analysis is
18 "deterministic" rather than "probabilistic," so it is essential that we analyze not only base
19 case results, but also various alternative scenarios. We must recognize and analyze the
20 risks posed by a world which does not always develop as the base case assumes. Our
21 obligation is not necessarily to pick what appears to be the lowest cost resource plan
22 under base case assumptions, but to pick the resource plan that we reasonably conclude is

1 the most reliable, cost-effective and robust plan over the long-term – in other words, the
2 plan that will best serve the public convenience and necessity.

3 Q. WHY DO YOU BELIEVE THAT THE CLIFFSIDE PROJECT REPRESENTS THE
4 MOST ROBUST CHOICE FOR A BASELOAD ADDITION FOR DUKE ENERGY
5 CAROLINAS AT THIS TIME?

6 A. First of all, Duke Energy Carolinas' 2005 and 2006 annual planning process reveals that
7 there is a significant need for additional Duke Energy Carolinas baseload capacity, as
8 well as peaking and intermediate capacity additions, to meet customers' needs over the
9 next five to ten years and beyond. In fact, we project the cumulative need for an
10 additional 2120 MW of new capacity resources on our system by 2011, which grows to
11 6120 MW by 2021. To put the magnitude of these capacity additions in perspective,
12 Duke Energy Carolinas built its current generating system of approximately 20,000 MW
13 over the past 100 years. The needed capacity additions reflect a nearly 11% increase in
14 our total system generating capability over just the next five years, and increase the size
15 of the generating system by nearly one-third over just the next 15 years.

16 There are a limited number of options to “solve” this capacity need: state-of-the-
17 art coal, natural gas, nuclear, renewable energy, and energy efficiency. Each of these
18 options has a part to play in a diverse resource portfolio, but each option also brings with
19 it strengths and weaknesses. For example, the timing of permitting and constructing
20 pulverized coal plants is more certain today than nuclear, and the market supply and price
21 for coal are more stable than natural gas. Yet, coal as a fuel source generally produces
22 higher air emissions, and thus continues to come under greater environmental scrutiny.
23 On the other hand, combined-cycle gas plants require less upfront capital cost, and are

1 also relatively predictable with respect to permitting and construction. But, as we are all
2 well aware, natural gas prices are higher and more volatile than coal. Nuclear generation
3 is an attractive and promising opportunity due to its zero greenhouse gas air emissions
4 and relatively stable fuel supply over the life of the plant. But, the nuclear construction
5 industry is in very early stages of redevelopment, and as a result, the timeliness,
6 standardization, and ultimate cost of nuclear permitting and construction are still far from
7 certain. Coal gasification is also a promising coal technology which has potential
8 viability in some parts of the country, but standard design and economics of IGCC plants
9 remain challenging, as well. Renewable energy and energy efficiency will undoubtedly
10 play increasingly important roles in meeting our customers' and our nation's energy
11 needs, but it is simply not practical to rely on these resources by themselves to meet these
12 customer needs in a timely and cost-effective manner.

13 The critical job for utility management is to analyze the need, the various options
14 to fill that need, and choose the best resource plan option for customers. The best
15 decision is one that considers more than base case economics; it is one that also considers
16 reliability, timeliness and probability of supply, along with reduced customer risk across
17 multiple scenarios.

18 The output from our updated IRP model alone (under base case assumptions)
19 indicates that the least cost portfolio for our customers would be to build combined cycle
20 gas in 2011 and 2012, followed by nuclear in 2016 and 2017, in addition to extensive
21 new peaking gas generation over the next 15 years. Mitigating the risk of being wrong in
22 base modeling assumptions about the future is just as important as picking what appears
23 to be the lowest cost plan today. In our judgment, two of the biggest unknowns right now

1 are: the volatility of natural gas prices and the feasibility of permitting and constructing a
2 nuclear plant in a timely manner. As Ms. Hager testifies, the analysis strongly supports
3 the addition of the Cliffside Project in scenarios when gas prices are high and when
4 nuclear is not available.

5 When the IRP sensitivity cases are analyzed, it becomes apparent that “the risk of
6 the wrong assumption” when it comes to nuclear feasibility is significant and cannot be
7 ignored. If construction of nuclear generation turns out not to be feasible in the near-
8 term, and if we have not added the Cliffside Project to our fleet, we will be forced to rely
9 heavily on natural gas generation to meet our increasing baseload energy needs -- too
10 heavily, in my judgment. If just two base case assumptions turn out to be wrong -- if
11 nuclear plants are not able to be permitted and constructed expeditiously, and if natural
12 gas prices are significantly higher than modeled in the base case -- these two assumptions
13 alone could cost our Company and our customers over \$1 billion more, as measured in
14 present value revenue requirements, than the portfolio with Cliffside and no nuclear. The
15 cost of “insuring” against potential nuclear unavailability and high gas prices is less than
16 one-half of one percent (0.5%) annually; whereas the potential cost of being unhedged
17 against both nuclear unavailability and high gas prices is about 2% annually, a fourfold
18 increase. I think that’s good insurance to have.

19 Along with many other important responsibilities that result from our position as a
20 franchised electric utility, reliably performing our obligation to serve is paramount.
21 Failure to recognize the risk mitigation and reliability benefits that the Cliffside Project
22 provides could jeopardize Duke Energy Carolinas’ ability to meet this obligation to our
23 customers, an unacceptable outcome. For these reasons, we continue to believe that

1 going forward with the Cliffside Project is the right choice for our Company and our
2 customers.

3 Q. PLEASE ELABORATE ON WHY YOU ARE UNCOMFORTABLE WITH THE
4 TIMING OF BRINGING NUCLEAR PLANTS ONLINE AND THE FUTURE PRICE
5 OF NATURAL GAS.

6 A. Nuclear generation appears to be very promising right now, particularly given the focus
7 on global climate change and the fact that nuclear generation does not produce
8 greenhouse gas emissions. Duke Energy Carolinas is actively pursuing the nuclear
9 option at its William States Lee, III site in South Carolina. The fact remains that no new
10 nuclear plants have been licensed under the new NRC regulations that permit combined
11 construction and operating licensing. While this regulatory approach is promising in that
12 it provides for greater assurance of cost and schedule certainty than existed in the 1970s
13 and 1980s, it has not yet been tested. In fact, the regulations are presently being revised;
14 and the license application acceptance criteria have not yet been issued. I am realistic
15 enough to know that getting new nuclear plants online by 2016 is by no means a sure
16 thing. As the Commission is aware, these uncertainties led the Company to file its
17 pending application for assurance of recovery of nuclear development costs in Docket
18 No. E-7, Sub 819.

19 As Mr. Rose discusses in his testimony, natural gas prices are projected to be
20 higher overall and subject to higher volatility. These risks make us hesitant to accept gas
21 generation as a substitute for the entire Cliffside Project. While we think it makes good
22 sense to continue to diversify our supply portfolio with natural gas-fired generation for
23 intermediate and peaking capacity needs and to explore promising more efficient gas

1 technologies, we believe that we should not rely exclusively on gas-fired generation and
2 nuclear to meet customer needs. The amount of additional gas generation we are
3 comfortable recommending at this time is the approximately 2700 MW that will be
4 required in addition to the Cliffside Project and new nuclear capacity.

5 Q. WITH THE UNCERTAINTIES YOU LISTED AS TO NUCLEAR AND GAS, WHY
6 ARE YOU COMFORTABLE RELYING ON COAL?

7 A. It's important to recognize that we are not considering just "any type of a coal plant" –
8 the proposed Cliffside Project represents a state-of-the-art pulverized coal plant, in terms
9 of air emission controls as well as operational efficiency. As a result, using this state-of-
10 the-art technology, and retiring existing Cliffside Units 1-4, Duke Energy Carolinas can
11 substantially increase its baseload capacity and generate substantial and needed
12 incremental energy without significantly increasing its environmental footprint. In fact,
13 the existence of the Cliffside Project units will give us the flexibility to run our oldest,
14 highest emissions coal plants far less, and to retire some of our older coal units earlier
15 than we otherwise would be able to. Subject only to the common sense assumptions I
16 outline elsewhere in my testimony, I propose to retire older coal units over time, as the
17 need for that capacity is obviated by effective energy efficiency programs.

18 While there are uncertainties as to future greenhouse gas regulation, the reality is
19 that fifty percent (50%) of all electricity in the United States is currently generated by
20 coal, and the U.S. continues to invest research and development dollars in coal
21 technology research. As a result, I do not believe that future regulation will cripple this
22 critical link to our economy and national security. Whatever form future CO₂ regulation
23 may take, I believe Duke Energy Carolinas will be better positioned to meet those

1 requirements with the Cliffside Project than without it. And as a practical matter, CO₂
2 regulation will impact “old coal” plants much more heavily than new, state-of-the-art
3 coal plants such as the Cliffside Project. The risk of carbon constraints and forced,
4 premature retirements of “old coal” generating capacity makes the addition of Cliffside
5 even more important to ensure a diverse portfolio of generation exists for the benefit of
6 customers.

7 Given the limited supplies, high prices, and price volatility of natural gas, as well
8 as abundant supplies, moderate prices and ready accessibility of coal, coal is and will
9 likely remain one of the most practical and abundant fuel choices for baseload electric
10 generation for the foreseeable future. Energy from coal is cheaper than energy from
11 natural gas on a dollar per British Thermal Unit (\$/btu) basis, while being more cost
12 effective for increasing baseload capacity than available renewable energy options.

13 Q. WHY ISN'T GREATER USE OF ENERGY EFFICIENCY AN OPTION TO REPLACE
14 THE CLIFFSIDE PROJECT?

15 A. Duke Energy Carolinas is fully committed to increasing our use of energy efficiency
16 programs. We strongly believe that energy efficiency can play an important role in
17 reducing the need for future generation, and we are fully engaged in our collaborative
18 process with stakeholders in the Carolinas to develop new programs. I remain committed
19 at Duke Energy and in the energy industry to identify key barriers limiting greater utility
20 investment in energy efficiency, and to develop and document sound business practices
21 for removing these barriers and thus increasing the use of energy efficiency as a resource
22 – the “fifth fuel,” so to speak. However, the impacts from greater investment in energy
23 efficiency cannot be realized overnight – we need to go through the collaborative process,

1 put a regulatory regime in place that truly “levels the playing field” among resource
2 options, and then implement a number of new energy efficiency programs. Given the
3 magnitude and timing of Duke Energy Carolinas’ capacity needs (an additional 2120
4 MW of new capacity additions on our system by 2011), it is clear that energy efficiency
5 by itself cannot meet those needs. We need a portfolio of resource options to meet our
6 customers’ needs most effectively over the long term, and both the Cliffside Project and
7 energy efficiency are important components of that portfolio. This bears repeating - - we
8 need the Cliffside Project *and* an aggressive energy efficiency plan.

9 While we do not believe that new energy efficiency programs can offset the need
10 for the Cliffside Project, implementation of cost-effective energy efficiency programs
11 system-wide will save energy and reduce emissions. At the September 2006 hearing in
12 this matter, I testified about the National Action Plan for Energy Efficiency’s aspirational
13 goal for utilities to invest one percent of annual revenues in energy efficiency programs.
14 For Duke Energy Carolinas, one percent of annual revenues is approximately \$50
15 million. Subject to completion of the Company’s ongoing collaborative stakeholder
16 process to develop new energy efficiency programs, and appropriate regulatory treatment
17 of the Company’s energy efficiency investments, Duke Energy Carolinas is willing to
18 commit to invest one percent of its annual revenues in energy efficiency programs. I
19 believe this commitment will take energy efficiency from concept to reality in the
20 Carolinas.

21 Q. YOU EMPHASIZE THE NEED FOR A DIVERSE RESOURCE PORTFOLIO –
22 AREN’T NATURAL GAS AND NUCLEAR, AS WELL AS ENERGY EFFICIENCY,
23 ALL PART OF SUCH A DIVERSE RESOURCE PORTFOLIO?

1 A. Absolutely. And as I've stated, we're planning on adding all of those resources to our
2 least-cost mix portfolio, in addition to this state-of-the-art Cliffside Project – at the right
3 time, in the right amounts, and for the right purpose. Duke Energy Carolinas' customers
4 have been well served by a diverse mix of coal and nuclear baseload generation, and
5 Duke Energy Carolinas has not added any new baseload coal in some 30 years. Duke
6 Energy Carolinas' rates to customers are among the lowest in the region, and well below
7 the national average. We believe those portfolio benefits to North Carolina customers
8 will continue with the construction of the Cliffside Project.

9 Q. HOW DOES DUKE ENERGY CAROLINAS PLAN TO TRY AND MITIGATE THE
10 INCREASING NEW COSTS OF GENERATION FOR ITS CUSTOMERS AND ITS
11 SHAREHOLDERS?

12 A. It's important to keep these estimated cost increases in perspective. Even with the
13 addition of the Cliffside Project, I believe that our rates will continue to be among the
14 lowest, regionally and nationally. I firmly believe that the Cliffside Project is the best
15 option to add to our least cost mix of supply side and demand side resources. Even if
16 one considers the Project to be at a "premium" from our base case, the cost "premium"
17 for the Cliffside Project – the price our customers will effectively pay for insurance
18 against nuclear plant permitting and construction risks and natural gas price volatility –
19 will only impact our rates by about one-half of one percent (0.5%) annually over the
20 long-term, even if the future unfolds just as our base case assumptions project. I believe
21 that investment is more than reasonable in the face of substantial uncertainty, and could
22 in fact be viewed as equivalent to insurance. Just as we all recognize that insurance is
23 more costly on average than not having insurance, we all choose to insure our homes, our

1 cars, our health, and our lives because we are not comfortable taking the risk of the
2 uncertain outcomes.

3 Nevertheless, we are committed to taking several steps to mitigate these costs for
4 our customers and our shareholders. First, other parties have expressed interest in
5 owning up to 50% of the Cliffside Project, to share in the costs, risks and resource
6 benefits of this Project. If we decide to partner with a joint owner for 50% of the Project,
7 we will mitigate our capital costs and customer rate impacts by a commensurate amount.
8 In essence, our customers would get a “volume” discount – 800 or so MW, built at the
9 lower 1600 MW cost. The addition of baseload capacity is a significant capital and
10 construction undertaking for any company, and in this case it makes good business sense
11 to explore spreading those costs, risks and resource benefits among more than one
12 electric provider in the region. It’s good for the economics of coal, and a preference for
13 joint ownership is reflected in the integrated resource model. If we contract with a joint
14 owner for up to 50% of the Cliffside Project, we will likely need to add an intermediate
15 combined cycle gas facility sooner than we otherwise would have. If we decide not to
16 contract with a joint owner, we will use 100% of the Cliffside Project as initially planned,
17 and our next generation expansion addition will be for less gas than otherwise would be
18 required. In any case, we expect to file a CPCN application for additional gas generation
19 shortly following this proceeding.

20 Second, I continue to believe that we should explore ways in the regulatory
21 process to reduce the financial burden of generation construction projects for companies
22 in a way that also benefits customers.

1 Q. WHAT ADDITIONAL COMMITMENTS DOES THE CLIFFSIDE PROJECT
2 ALLOW DUKE ENERGY CAROLINAS TO MAKE?

3 A. As I testified to during the September hearing, the approval of the Cliffside Project would
4 provide additional fleet modernization opportunities. As I've touched upon already in
5 my testimony here, upon the commercial operation of the Cliffside Project, and
6 coincident with effective energy efficiency programs, subject to appropriate regulatory
7 treatment and the absence of compelling customer or system reliability needs, Duke
8 Energy Carolinas will begin to retire generation from its existing older, less efficient coal
9 generation units, on a megawatt per megawatt realized basis. In other words, for every
10 megawatt saved by new energy efficiency programs, the Company will retire an
11 equivalent amount of older coal unit megawatts up to the level of megawatts added by the
12 Cliffside Project to Duke Energy Carolinas' generation fleet. These fleet modernization
13 retirements are in addition to the 198 MW Cliffside Units 1-4 that we previously agreed
14 to retire as part of the Cliffside Project and will allow us to reduce our environmental
15 footprint.

16 Q. PLEASE SUMMARIZE WHY YOU BELIEVE THE COMMISSION SHOULD ISSUE
17 A CPCN FOR THE CLIFFSIDE PROJECT.

18 A. As an electric utility CEO for 18 years, I have had the opportunity to be involved in a
19 number of important energy issues facing our country, such as generation expansion,
20 sustainability, energy efficiency, and climate change. These activities have given me an
21 important perspective and understanding of the importance of these energy resource
22 issues, and I and Duke Energy will remain committed to leadership in these areas. Based
23 upon my experience and judgment, having considered the timing and magnitude of our

1 customers' needs, the reliability of supply across multiple possible future scenarios, the
2 cost of the options, and the economic development benefits the Cliffside Project provides,
3 I continue to believe that the Cliffside Project represents the best option for meeting our
4 obligation to serve our customers' baseload electricity needs, and I continue to believe
5 that the Commission should approve our CPCN application.

6 Q. DOES THIS COMPLETE YOUR SUPPLEMENTAL DIRECT TESTIMONY?

7 A. Yes, it does.