

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, Sub 831

In the Matter of:	)	TESTIMONY OF J. RICHARD HORNBY ON
Application of Duke Energy Carolinas,	)	BEHALF OF ENVIRONMENTAL DEFENSE
Inc. for Approval of Save-a-Watt	)	FUND, NATURAL RESOURCES DEFENSE
Approach, Energy Efficiency Rider and	)	COUNCIL, SOUTHERN ALLIANCE FOR
Portfolio of Energy Efficiency Programs	)	CLEAN ENERGY AND SOUTHERN
	)	ENVIRONMENTAL LAW CENTER
)	

1 I. INTRODUCTION

2 Q. PLEASE STATE YOUR NAME, EMPLOYER, AND PRESENT POSITION.

3 A. My name is J. Richard Hornby. I am a Senior Consultant at Synapse Energy Economics,
4 Inc., 22 Pearl Street, Cambridge, MA 02139.

5 Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS CASE?

6 A. I am testifying on behalf of a coalition (“Coalition”) consisting of Environmental Defense
7 (“ED”), the Natural Resources Defense Council (NRDC), Southern Alliance for Clean
8 Energy (“SACE”) and the Southern Environmental Law Center (“SELC”). The members
9 of this coalition are nonprofit, nonpartisan organizations who promote responsible energy
10 choices that solve global warming problems and ensure clean, safe and healthy
11 communities in North Carolina.

12 Q. PLEASE DESCRIBE SYNAPSE ENERGY ECONOMICS.

13 A. Synapse Energy Economics (“Synapse”) is a research and consulting firm specializing in
14 energy and environmental issues, including: electric generation, transmission and
15 distribution system reliability, market power, electricity market prices, stranded costs,
16 efficiency, renewable energy, environmental quality, and nuclear power.

17 Q. PLEASE SUMMARIZE YOUR WORK EXPERIENCE AND EDUCATIONAL
18 BACKGROUND.

19 A. I am a consultant specializing in planning, market structure, ratemaking, and gas
20 supply/fuel procurement in the electric and gas industries. Over the past twenty years, I
21 have presented expert testimony and provided litigation support on these issues in
22 approximately 100 proceedings in over thirty jurisdictions in the United States and

1 Canada. Over this period, my clients have included staff of public utility commissions,
2 state energy offices, consumer advocate offices and marketers.

3 Prior to joining Synapse in 2006, I was a Principal with CRA International and,
4 prior to that, Tabors Caramanis & Associates. From 1986 to 1998, I worked with the
5 Tellus Institute (formerly Energy Systems Research Group), initially as Manager of the
6 Natural Gas Program and subsequently as Director of their Energy Group. Prior to 1986,
7 I was Assistant Deputy Minister of Energy for the Province of Nova Scotia.

8 I have a Master of Science in Energy Technology and Policy from the
9 Massachusetts Institute of Technology ("MIT") and a Bachelor of Industrial Engineering
10 from the Technical University of Nova Scotia, now merged with Dalhousie University. I
11 have attached my current resume to this testimony as Hornby Exhibit 1.

12 **Q. PLEASE SUMMARIZE YOUR EXPERIENCE WITH ENERGY EFFICIENCY**
13 **MEASURES AND POLICIES.**

14 **A.** My experience with energy efficiency measures and policies began over thirty years ago
15 when I was a project engineer responsible for identifying and pursuing opportunities to
16 reduce energy use in a factory in Nova Scotia. Subsequently, in my graduate program at
17 MIT I took several courses on energy technologies and policies, and prepared a thesis
18 analyzing federal policies to promote investments in energy efficiency. After MIT, I
19 spent several years with the government in Nova Scotia, during which time I
20 administered a provincial program to promote energy conservation in the industrial sector
21 and later included energy conservation in all sectors as part of energy plans developed for

1 the province. Over the past twenty years as a regulatory consultant, I have helped review
2 and prepare numerous integrated resource plans in the gas and electric industries

3 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

4 A. Duke Energy Carolinas, LLC (“Duke Energy Carolinas” or the “Company”) is requesting
5 approval of a new approach to energy efficiency program funding, which it refers to as
6 “save-a-watt”, including an energy efficiency rider (“Rider EE”) to compensate it for
7 verified reductions achieved by those programs. The Coalition retained Synapse to
8 review various aspects of the Company’s request. The purpose of my testimony is to
9 describe my analyses of the Company’s proposed compensation scheme and present my
10 conclusions based upon that review.

11 **Q. ARE YOU PRESENTING ANY EXHIBITS TO SUPPORT YOUR TESTIMONY?**

12 A. Yes. I have prepared eleven exhibits to support my testimony. Confidential Hornby
13 Exhibit 2 presents data that the Company has designated as confidential, and is
14 designated as such. My other Exhibits do not present confidential data. The eleven
15 supporting exhibits are as follows:

16 Confidential Hornby Exhibit 2	Summary of Save-A-Watt Proposal - Costs 17 and Results
18 Hornby Exhibit 3	Projected Reductions In Annual Energy By 19 “Vintage” Year
20 Hornby Exhibit 4	Electric Capacity and Energy for an 21 Illustrative Year and Utility
22 Hornby Exhibit 5	Relative Impacts on Annual Bill of 23 Reductions In Electric Capacity and Energy 24
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1	Hornby Exhibit 6	Policy and Ratemaking Frameworks for Annual Energy Efficiency Expenditures in Various States
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5	Hornby Exhibit 7	Example 1 – The Company recovers more from reductions in peak demand under save-a-watt than under a cost-of-service approach
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9	Hornby Exhibit 8	Example 2 - The Company recovers more from an increase in avoided costs under save-a-watt than under a cost-of-service approach
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14	Hornby Exhibit 9	Example 3 - The Company may recover more after a general rate case under save-a-watt than under a cost-of-service approach
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18	Hornby Exhibit 10	Utility Share Of Savings Under Cost-Of-Service and Save-a-watt Approaches
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21	Hornby Exhibit 11	Reductions in Annual Energy Achieved by Utility Programs in Various States and Proposed by Duke Energy Companies
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25	Hornby Exhibit 12	Responses of Duke Energy Carolinas, Inc. to Selected Data Requests
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27		

28 **Q. WHAT DATA SOURCES DID YOU RELY UPON TO PREPARE YOUR**
29 **TESTIMONY AND EXHIBITS?**

30 A. I relied primarily on the Direct Testimony, exhibits, and workpapers of the Company
31 witnesses. I also relied upon Company responses to data requests, a number of which I
32 have presented in Hornby Exhibit 12. I also reviewed materials that Duke’s sister
33 companies have filed on this issue in South Carolina, Indiana and Ohio. In addition, I
34 reviewed the March 21, 2007 Order issued by the North Carolina Utilities Commission
35 (“Commission”) in Docket No. E-7, Sub 790, the Company’s application for approval to

1 construct two 800 MW coal units (“Cliffside order”) as well as the Commission’s
2 February 29, 2008 Order in Docket No. E-100, sub 113 establishing revised regulations
3 to implement Session Law 2007 – 397. Finally, I reviewed various orders and reports
4 regarding ratepayer-funded efficiency programs and cost recovery frameworks in other
5 states.

6 **Q. PLEASE SUMMARIZE THE REDUCTIONS THAT THE COMPANY EXPECTS**
7 **TO ACHIEVE UNDER SAVE-A-WATT AND THE COMPENSATION IT IS**
8 **REQUESTING FOR THOSE REDUCTIONS.**

9 A. The Company is proposing to offer eight programs under save-a watt in North Carolina.
10 According to its proposed budgets for these programs, and its projected reductions from
11 them, the Company is placing more emphasis on reducing peak demand than on reducing
12 annual energy use. For example, by the fourth year of its programs Duke is projecting
13 cumulative reductions in peak demand equivalent to 7.8 %¹ of its forecast peak demand
14 for 2011. In contrast, by the fourth year of its programs Duke is projecting cumulative
15 reductions in annual energy equivalent to only 1.2 % of its forecast of annual energy sales
16 for 2011. These summary statistics are presented in Confidential Hornby Exhibit 2.

17 That reduction by 2011 reflects the cumulative impact of “first year” or
18 incremental reductions equivalent to about **0.29%** per year of annual sales in each of the
19 four years. In contrast, utilities in several other states are achieving annual incremental
20 reductions several times greater than that, *i.e.*, incremental annual reductions each year

¹ Unless noted otherwise the percentages I use to describe aspects of the Company’s filing are derived from data provided by the Company in order to maintain the confidentiality of that source data.

1 equal to between 1 and 2 percent of annual sales. The Company's projected reductions in
2 annual energy are extremely low by comparison.

3 **Q. PLEASE DESCRIBE THE COMPENSATION THAT THE COMPANY IS**
4 **REQUESTING FOR THOSE REDUCTIONS.**

5 A. Under save-a-watt, the Company is proposing to be compensated for the value of the
6 reductions achieved through its programs based on revenue requirements equal to 90
7 percent of its avoided costs of capacity and energy. Under this approach, the Company
8 will receive a much higher share of the savings from these reductions, calculated as
9 avoided costs minus program costs, than under the types of energy efficiency shared
10 savings mechanisms in place in other states. For example, under save-a-watt, the
11 Company would receive approximately 81% of the savings as compared to
12 approximately 12% under shared savings mechanisms in Ohio and California. However,
13 unlike the ratemaking frameworks in those two states, which include a separate
14 adjustment mechanism for addressing under-collection of revenues due to energy
15 efficiency reductions, the Company is proposing to recover its lost revenues as part of its
16 value-based revenue requirements.

17 This value-based ratemaking approach has been characterized as a "...distinct
18 departure from cost recovery and shareholder incentives convention."² As indicated by
19 the Company's application in this proceeding, this proposed approach is a departure from
20 the existing, cost-of-service based ratemaking framework in North Carolina.

² Jensen, Val (ICF International). *Aligning Utility Incentives with Investment in Energy Efficiency*, National Action Plan for Energy Efficiency, November 2007, page ES-10

1 **Q. PLEASE EXPLAIN HOW SAVE-A-WATT DEPARTS FROM COST-OF-**
2 **SERVICE REGULATION.**

3 A. The save-a-watt proposal differs from the existing approach to ratemaking in North
4 Carolina, and traditional utility rate regulation in general, by setting rates based upon
5 value-of-service rather than cost-of-service. Regulated utilities typically have an
6 obligation to provide reliable service at reasonable rates. Under traditional rate
7 regulation, the current approach in North Carolina, rates are generally considered to be
8 “reasonable” if they are based upon the utility’s cost of providing the service.

9 Under the existing ratemaking framework, the Company files for changes in rates
10 to recover its proposed revenue requirements, which in turn are based upon its estimated
11 cost-of-service including an allowance for earnings, *i.e.*, a return in rate base. The parties
12 to the proceeding then review the Company proposal in detail, including the underlying
13 estimates of costs. Finally, the Commission approves a set of rates that reflect its
14 adjustments to the Company’s proposed revenue requirements based upon its review of
15 the evidence presented by the Company and all parties.

16 The Company’s proposed save-a-watt approach represents a significant departure
17 from this existing ratemaking framework. The Company is requesting that the
18 Commission approve energy efficiency-related revenue requirements, and associated
19 rates, that are based upon the “value” of reductions in demand and energy achieved from
20 its programs, rather than on either the estimated or actual costs it incurs to achieve those
21 reductions.

1 Q. PLEASE SUMMARIZE YOUR MAJOR CONCLUSIONS AFTER REVIEWING
2 THE COMPANY'S PROPOSAL.

3 A. The Company's save-a-watt proposal is not in the public interest and its incentive
4 structure is not appropriate, for the following reasons.

- 5 • First, the Company could achieve the same reductions in annual energy use at the
6 same or lower revenue requirements under the cost-of-service based framework
7 currently provided for in North Carolina.
- 8 • Second, under save-a-watt the Company is requesting that its acquisition of
9 reductions via demand-side management and energy efficiency be treated more
10 favorably than its acquisition of supply from a ratemaking perspective. The
11 Company wants to be compensated on a value-of-service basis rather than a cost-
12 of-service basis. Moreover, the margin between the "value" of these reductions
13 and the cost of acquiring them is likely to increase over time, as avoided energy
14 costs are expected to increase more rapidly than the actual cost of acquiring
15 reductions in annual energy. The Company also apparently wants to under-report
16 its earnings from save-a-watt revenues during periods when its actual program
17 costs are less than those revenues. Despite requesting this favorable ratemaking
18 treatment, the Company is proposing to achieve a low level of reductions in
19 annual energy and associated air emissions compared to leading utilities in other
20 states, who are achieving and/or proposing to achieve 3 to 7 times greater
21 reductions in annual energy use, *i.e.*, incremental or first year reductions of 1 to 2
22 percent of annual sales.

- 1 • Third, according to the Company's estimates of avoided energy costs and net lost
2 revenues, save-a-watt does not provide it with a strong financial incentive to
3 avoid construction of new baseload generation by pursuing all cost-effective
4 reductions in annual energy.

5 **Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS.**

6 A. I recommend that the Commission reject the Company's request and instead require the
7 Company to file a new application. In that new application the Company should be
8 encouraged to propose a ratemaking framework, consistent with Commission rules, that
9 will remove the disincentive to promote energy efficiency and provide it with a strong
10 financial incentive to avoid construction of new baseload generation by pursuing all cost-
11 effective reductions in annual energy, and to propose a set of energy efficiency programs
12 to achieve that goal. In its new filing the Company should be required to "unbundle" its
13 net lost revenues into generation, transmission and distribution service components.

14 If the Commission does not reject the Company's request, I recommend that it
15 require the Company to report its earnings on save-a-watt revenues based upon its actual
16 program costs.

1 II. THE SAVE-A-WATT PROPOSAL

2 Q. PLEASE SUMMARIZE THE PROGRAMS THAT THE COMPANY IS
3 PROPOSING UNDER SAVE-A-WATT.

4 A. The Company is proposing to offer eight programs under save-a-watt, five for residential
5 customers and three for non-residential customers (Direct Testimony, Company witness
6 Schultz, page 17). In the residential sector, five programs are energy conservation and
7 one is demand response, while in the non-residential sector, two programs are energy
8 conservation and one is demand response. These programs would replace the Company's
9 existing programs.

10 My review of the Company's proposed budgets for these programs, and its
11 projected reductions from them, indicates that the Company is placing more emphasis on
12 demand response, *i.e.*, reducing peak demand, than on energy conservation, *i.e.*, reducing
13 annual energy use. The summary statistics supporting this analysis are presented in
14 Confidential Hornby Exhibit 2.

15 Over the first four years the Company is proposing to spend approximately 54%
16 of its DSM program costs on demand response measures and 46% on energy
17 conservation measures.³ As summarized earlier, it is projecting to achieve greater
18 reductions in peak demand, as a percent of forecast requirements, than on annual energy
19 requirements, as a percent of forecast requirements. Of most concern is the fact that the
20 Company's projected reductions in annual energy are extremely low by comparison to

³ The Company has projected annual program costs for demand response beyond 2011, but has only projected energy conservation program costs through 2011.

1 those being achieved by leading utilities in several other states. Those reductions are also
2 at the lowest end of the range of incremental annual reductions as a percentage of annual
3 sales identified almost two years ago, in the July 2006 National Action Plan for Energy
4 Efficiency (“NAPEE”),⁴ which was co-chaired by Duke CEO Jim Rogers. That range is
5 from 0.15 percent to 1 percent, with the Executive Summary only reporting 1 percent.

6 **Q. PLEASE SUMMARIZE THE COMPENSATION ASPECT OF SAVE-A-WATT.**

7 A. Save-a-watt is basically a proposal to change the method through which the Company is
8 compensated for its expenditures on demand-side management. According to Company
9 witness Rogers, the Company is proposing to “implement a comprehensive set of cost-
10 effective energy efficiency programs, and to be compensated by receiving through a rider
11 90% of the avoided fixed and variable supply-side costs” (Rogers Direct Testimony, page
12 14). The change in compensation for these expenditures is from a cost-of-service
13 approach to a value-of-service approach.

14 The Company uses the term “energy efficiency” to refer to both demand response
15 and energy conservation measures and programs. In contrast, my summary and review of
16 save-a-watt distinguishes between its demand response programs and its annual energy
17 efficiency programs because those two categories of measures and programs produce
18 very different results and have different implications for the Company’s future generation
19 mix, environmental impacts and rates. The industry typically refers to these two

⁴ NAPEE, July 2006, pages ES-4 and 6-5.

1 categories of measures and programs, in aggregate, as demand-side management
2 (“DSM”).

3 In North Carolina, in N.C. Gen. Stat. § 62-133.7(a) and Commission Rule R8-66,
4 DSM is defined differently from energy efficiency:

5 **Demand-side management** (also known as demand response) – activities,
6 programs or initiatives undertaken by an electric power supplier or its customers
7 to shift the timing of electricity use from peak to nonpeak demand periods
8

9 **Energy efficiency** (also known as energy conservation) measure – an equipment,
10 physical or program change that results in less energy used to perform the same
11 function – includes combined heat and power but does not include demand-side
12 management
13

14 (I am aware that there is some inconsistency in the regulations between these two explicit
15 definitions and the single definition of DSM in Rule R8-60 as “...demand response
16 programs and energy efficiency and conservation programs.”)

17 In the balance of my testimony I will refer to DSM and energy efficiency as
18 defined in N.C.G.S. § 62-133.7(a).

19 **Q. PLEASE SUMMARIZE YOUR UNDERSTANDING OF HOW THE COMPANY’S**
20 **COMPENSATION WILL VARY ACCORDING TO THE VINTAGE OF THE**
21 **REDUCTIONS.**

22 A. The establishment of revenue requirements by vintage is an important element of save-a-
23 watt. Mr. Farmer discusses how he applies the vintage concept to determination of
24 revenue requirements starting at page 8 of his Direct Testimony. I will describe it briefly
25 below, and refer to it in several of the analyses presented in my testimony

26 My understanding is that the Company will establish revenue requirements for
27 each program to compensate it for the projected reductions from the measures

1 implemented under that program according to the installation year, *i.e.*, the “vintage” of
2 the measures. The Company filing refers to vintage years 1 through 4. For purposes of
3 illustration I assume those vintage years correspond to years 2008 through 2011
4 respectively.

5 For example, the Company forecasts that an energy conservation measure
6 installed in 2008 will produce a stream of annual energy reductions over the life of the
7 measure, *i.e.*, 2008 vintage reductions. The Company has estimated the energy costs it
8 would avoid due to those reductions over that lifetime, *i.e.*, 2008 vintage avoided costs.
9 Thus the 2008 vintage revenue requirements equal 90 percent of the 2008 vintage
10 avoided costs, which in turn are a function of the 2008 vintage reductions.

11 For 2009 the Company will develop a new, updated set of avoided costs. It will
12 then use those updated avoided costs and its 2009 vintage reductions to calculate the
13 2009 vintage revenue requirements.

14 **Q. HAS THE COMPANY PROVIDED EXPLICIT ESTIMATES OF REDUCTIONS,**
15 **AVOIDED COSTS AND REVENUE REQUIREMENTS FOR MEASURES**
16 **INSTALLED IN VINTAGE YEARS 2 THROUGH 4?**

17 A. No, as indicated in Hornby Exhibit 12. Dr. Stevie provides projected reductions for
18 energy conservation measures installed in vintage years 1 through 4 in Confidential
19 Stevie Exhibit 4. However, he does not explicitly distinguish the reductions by vintage. I
20 have plotted what I understand to be the projected annual energy reductions by vintage,
21 for each of vintage years 1 to 4, in Hornby Exhibit 3.

1 Neither Dr. Stevie nor Mr. Farmer provides explicit projected avoided costs or
2 revenue requirements for vintage years 2 through 4.

3 **III. DEMAND RESPONSE VERSUS ENERGY CONSERVATION**

4
5 **Q. YOUR ANALYSIS OF SAVE-A-WATT MAKES A DISTINCTION BETWEEN**
6 **DEMAND RESPONSE PROGRAMS AND ENERGY CONSERVATION**
7 **PROGRAMS. WHAT IS THAT DISTINCTION?**

8 A. Mr. Rogers and other Company witnesses refer to save-a-watt as an “energy efficiency”
9 proposal. However, under save-a-watt the Company is proposing both demand response
10 programs and energy conservation programs. My review makes a distinction between
11 those two categories of measures because energy efficiency/conservation and demand
12 response produce very different results and have very different implications for the
13 Company’s future generation mix, environmental impacts and revenue requirements.
14 Throughout my testimony I will use the terms demand response and energy conservation.

15 **Q. WHY IS IT IMPORTANT TO DISTINGUISH BETWEEN DEMAND RESPONSE**
16 **PROGRAMS AND ENERGY CONSERVATION PROGRAMS?**

17 A. Those two categories need to be distinguished primarily because reductions in total
18 electricity use through energy conservation results in greater reductions in annual supply
19 costs and environmental impacts than reductions in peak demand through demand
20 response. In order to appreciate these differences, it is important to understand the
21 difference between electric capacity and electric energy. I illustrate the difference
22 between those two categories of supply, and of demand response and energy
23 conservation, in three charts presented on pages 1 to 3 of Hornby Exhibit 4.

1 The first chart, on page 1 of Hornby Exhibit 4, presents the aggregate electric
2 energy use of customers of a representative utility, by hour, over a year. The shaded area
3 represents aggregate electricity use in each hour plotted from the hour of highest
4 aggregate use, typically referred to as peak demand, to the hour with the lowest aggregate
5 use.

- 6 • **Capacity.** In order to ensure reliable service, the utility serving this load will own
7 or control enough generating capacity⁵ to serve the peak demand plus a reserve
8 margin, typically in the range of 15%. The utility incurs a fixed cost for this
9 capacity, regardless of whether it ever dispatches it to produce electric energy.
10 Therefore, the “marginal” source of such capacity is often a gas-fired combustion
11 turbine (“CT”) plant, which has a low capital cost and a high operating cost.
- 12 • **Energy.** In order to supply the quantity of electricity customers use in each hour
13 the utility generates and/or purchases electric energy.⁶ The utility incurs fixed
14 costs for the capacity from which it generates this energy, and a variable cost for
15 every MWh generated. The cost of this energy represents the largest portion of
16 the cost of electricity supply to most customers, much greater than the capacity
17 cost. In addition, the acquisition and combustion of fuels used to generate this
18 energy produce the vast majority of the environmental impacts associated with
19 annual electricity use.

⁵ Capacity is typically measured in megawatts (“MW”) at the supply level and kilowatts (“kW”) at the customer level.

⁶ Energy is typically measured in megawatt-hours (“MWh”) at the supply level and kilowatt-hours (“kWh”) at the customer level.

1 The second chart, on page 2 of Hornby Exhibit 4, illustrates the impact of a 5%
2 reduction in peak demand due to demand response. In this example, demand response
3 measures reduce customer energy use by 5% in relatively few hours per year (*e.g.*, 90
4 hours). In response to this reduction the utility could reduce the quantity of capacity it
5 holds by 5%, and avoid the associated costs of that capacity. However, that 5% peak
6 demand reduction would not produce a corresponding reduction in a customer's annual
7 bill. Moreover that reduction would result in little or no avoided air emissions because it
8 is not reducing annual electricity generation in a material way.

9 The third chart, on page 3 of Hornby Exhibit 4, illustrates the impact of a 5%
10 reduction in annual energy use. In this example, energy conservation measures reduce
11 customer energy use by 5% in every hour of the year (8,760 hours). In response to this
12 reduction the utility could reduce the quantity of capacity it holds by 5%, as well as
13 reduce the quantity of electricity it generates in every hour by 5%. This 5% annual
14 electricity generation reduction would produce a corresponding decrease in a
15 participating customer's annual bill. It should also provide a corresponding reduction in
16 air emissions, including avoided carbon dioxide associated with the avoided electric
17 energy.

1 **Q. HAS THE COMPANY PRESENTED THE RELATIVE IMPACTS OF A**
2 **REPRESENTATIVE REDUCTION IN PEAK DEMAND AND IN ANNUAL**
3 **ENERGY ON THE ANNUAL BILLS OF AVERAGE CUSTOMERS?**

4 A. No. See Hornby Exhibit 12, which reflects Company responses to Coalition data
5 requests.

6 **Q. CAN YOU ILLUSTRATE THE RELATIVE IMPACTS OF REDUCTIONS IN**
7 **PEAK DEMAND AND IN ANNUAL ENERGY ON THE ANNUAL BILL OF A**
8 **REPRESENTATIVE SMALL USAGE CUSTOMER?**

9 A. Yes. I illustrate the impact of 5% reductions in peak demand and annual energy on a
10 low-usage customer, such as a small commercial customer of Duke in North Carolina.
11 For this illustration I consider two such customers based upon usage and typical bill data
12 drawn from the Winter 2006 version of *Typical Bills and Average Rates Report* published
13 by the Edison Electric Institute.

14 The two customers in this example each have a peak demand of 3 kw. Customer
15 A has annual usage of 4,500 kWh, an annual bill of \$564 and a load factor⁷ of 17%,
16 categorized as low. Customer B has an annual usage of 12,000 kWh, an annual bill of
17 \$1,296 and a load factor of 46%, categorized as mid. For avoided capacity and energy
18 costs I use illustrative values that are somewhat higher than those used by the Company
19 in order to keep its estimates confidential and to err on the high side when calculating
20 savings in annual bills.

21 The inputs and results are presented in Hornby Exhibit 5. First, I calculate the
22 impact on annual bills of a 5% reduction in peak demand in 1% of the hours. The

1 savings were approximately 2.3% and 1.0% for customers A and B respectively. Next, I
2 calculate the impact on annual bills of a 5% reduction in use in every hour of the year, i.e.
3 a 5 % reduction in annual energy use. The impacts on annual bills were much larger, with
4 savings of approximately 5.3% and 4.6% for customers A and B respectively.

5 These illustrative results indicate that a 5% reduction in peak demand does not
6 provide a corresponding reduction in the annual bill of a representative small customer,
7 while a 5% reduction in annual energy does produce a corresponding decrease in a
8 participating customer's annual bill.

9 **Q. HAS THE COMPANY PRESENTED THE IMPACTS OF A REDUCTION IN**
10 **PEAK DEMAND ON THE ENVIRONMENTAL IMPACTS ASSOCIATED WITH**
11 **ENERGY USE, AS DISTINCT FROM THE IMPACTS OF A REDUCTION IN**
12 **ANNUAL ENERGY USE?**

13 A. No. See Hornby Exhibit 12, which reflects Company responses to Coalition data
14 requests.

15
16 **IV. RATEMAKING UNDER SAVE-A-WATT VERSUS COST-OF-SERVICE**

17
18 **Q. PLEASE SUMMARIZE HOW THE SAVE-A-WATT PROPOSAL DIFFERS**
19 **FROM THE EXISTING APPROACH TO RATEMAKING IN NORTH**
20 **CAROLINA.**

21 A. Save-a-watt differs from the existing approach to ratemaking in North Carolina, and
22 traditional utility rate regulation in general, by setting revenue requirements based upon
23 value-of-service rather than cost-of-service. Regulated utilities typically have an
24 obligation to provide reliable service at reasonable rates. Under traditional rate

⁷ Load factor is a ratio that measures relative use of capacity. It is equal to annual energy use (kWh) divided by peak demand in kW multiplied by 8,760 hours.

1 regulation, the current approach in North Carolina, revenue requirements are generally
2 considered to be “reasonable” if they are based upon the utility’s cost of providing the
3 service.

4 Under this current ratemaking framework the Company files for changes in rates
5 to recover its proposed revenue requirements, which in turn are based upon its estimated
6 cost-of-service including an allowance for earnings (*i.e.*, a return in rate base). All parties
7 then review the Company proposal in detail, including all the underlying estimates of
8 costs. Finally, the Commission approves a set of rates that reflect its adjustments to the
9 Company’s proposed revenue requirements based upon its review of the evidence
10 presented by the Company and all parties.

11 The Company’s proposed save-a-watt approach is a departure from this existing
12 ratemaking framework. The Company is requesting that the Commission approve
13 revenue requirements, and rates to collect those revenue requirements, that are based
14 upon the “value” of the reductions in peak demand and annual energy.

15 **Q. IS THE SAVE-A-WATT APPROACH NECESSARY IN ORDER FOR THE**
16 **COMPANY TO TREAT REDUCTIONS FROM EFFICIENCY PROGRAMS THE**
17 **SAME AS GENERATION ACQUIRED FROM SUPPLY RESOURCES?**

18 **A.** No. In fact, under save-a-watt the Company is requesting that its acquisition of
19 reductions via demand-side management be treated more favorably than its acquisition of
20 supply from a ratemaking perspective.

21 For supply resources that it owns its rates are set to recover variable operating
22 costs, depreciation and an allowed rate of return all of which have been reviewed by the

1 Commission. For supply resources that the Company does not own, it simply recovers
2 its purchased electricity costs. Thus, if the Company found a source of generation with a
3 cost less than its avoided costs, not only would the Company have to buy that generation
4 to provide its customers service at reasonable rates or “best value.” The Company would
5 not receive any “earnings” on the acquisition of generation from that resource. See
6 Hornby Exhibit 12, which reflects the Company’s response to Coalition data requests.

7 In contrast, under save-a-watt, the Company seeks to be compensated for its
8 reductions on a value-of-service basis, *i.e.*, 90% of avoided costs, with *no cap* on those
9 revenues. Moreover, the discrepancy between the “value” of these reductions and the
10 cost of acquiring them is likely to increase over time, as avoided energy costs are
11 expected to increase more rapidly than the actual cost of acquiring reductions in annual
12 energy.

13 **Q. PLEASE SUMMARIZE THE COST-OF-SERVICE BASED RATEMAKING**
14 **FRAMEWORK CURRENTLY AVAILABLE TO THE COMPANY IN NORTH**
15 **CAROLINA.**

16 A. Under Commission Rules R8-68 and R8-69, the Commission has the authority to approve
17 incentive programs for utility expenditures on energy efficiency and DSM. My
18 understanding is that under the current framework, the Company could recover three
19 major categories of costs and incentives associated with reductions from energy
20 efficiency and DSM. As described in Rules 8-68 and 8-69, those three major categories
21 of costs and incentives are:

- 1 • **Program costs.** The rules provide for recovery of direct costs of programs, in an
2 explicit and transparent fashion. These program costs have to be verified.
- 3 • **Lost revenues.** The rules provide for an “incentive” that may be awarded
4 representing revenues that the Company does not collect, *i.e.*, “loses” as a result
5 of reductions in annual energy under its DSM programs, which are not offset by
6 avoided costs. They are revenues the Company was collecting to recover its fixed
7 costs. (Lost revenues are eliminated when the Company files its next general rate
8 case and resets its rates to recover its fixed costs from the new lower level of test
9 year billing determinants.) Like program costs, these lost revenues would have to
10 be verified.
- 11 • **A financial incentive for performance.** The rules provide for an incentive that
12 could be a share of the savings resulting from verified reductions achieved
13 through DSM. This incentive could be based on the performance of the utility in
14 achieving an explicit reduction goal, could be subject to a cap, and could include
15 penalties for failure to achieve a threshold level of performance.

16 **Q. ARE YOU PROPOSING A SPECIFIC APPROACH TO THE DESIGN OF ANY**
17 **COMPONENTS UNDER THAT GENERAL RATEMAKING FRAMEWORK?**

18 A. No. Proposing detailed designs of each rate mechanism under that general framework is
19 beyond the scope of my testimony in this proceeding. I understand that the Commission
20 has opened a generic proceeding, Docket No. E-100, Sub 116, to address those details
21 and that various parties, including the Coalition members, recently filed comments in that
22 docket regarding the design of an appropriate framework.

1 **Q. IS THE COST-OF-SERVICE RATEMAKING FRAMEWORK AVAILABLE TO**
2 **THE COMPANY IN NORTH CAROLINA CONSISTENT WITH THE**
3 **RATEMAKING FRAMEWORKS FOR ENERGY EFFICIENCY**
4 **EXPENDITURES IN OTHER STATES?**

5 A. Yes. The ratemaking framework now available to the Company and other utilities in
6 North Carolina has components that can help align the utility's financial interest with
7 investments in reductions in annual electricity use. The most notable missing component
8 is an explicit policy target for annual reductions in energy use, which is sometimes
9 expressed as a percentage of annual energy requirements to be met through reductions
10 from energy conservation.

11 The cost-based ratemaking frameworks in effect in several other states are
12 presented in Hornby Exhibit 6. This exhibit includes the ratemaking frameworks in the
13 states that Company witness Rose discusses in his Direct Testimony.

14 **Q. DO ANY DUKE COMPANIES HAVE EXPERIENCE OPERATING UNDER**
15 **SUCH A RATEMAKING FRAMEWORK?**

16 A. Yes. Two sister companies of Duke Energy Carolinas have experience operating under
17 the cost-based ratemaking framework for energy efficiency programs that is described in
18 North Carolina rules.

19 PSI Energy, a predecessor company to Duke Energy Indiana, operated under this
20 type of ratemaking framework for several years in the early 1990s. More recently, in
21 2004 PSI Energy filed an application for exactly this type of ratemaking framework in
22 Cause No. 42612. In its May 25, 2005 Order in that proceeding, at page 22, the Indiana
23 Utility Regulatory Commission ("IURC") stated that "...utilities should not be financially

1 discouraged from pursuing demand-side management options and, under appropriate
2 circumstances, financial incentives may be essential.” However, the IURC went on to
3 state that “...the burden is on the utility to demonstrate the validity and reasonableness of
4 the proposed lost revenues and proposed shared savings. In this Cause, the current
5 proposal fails.”

6 Duke Energy Ohio is operating under this type of ratemaking framework.⁸ Under
7 this framework, Duke Energy Ohio has the opportunity to recover its program costs, net
8 lost revenues and a maximum of 10% of the remaining net savings if it meets 100 percent
9 of its targeted goal. According to its application, Duke Energy Ohio was projecting
10 reductions in annual energy equivalent to approximately 0.4 % of its forecast of annual
11 energy sales for 2006, as noted in Hornby Exhibit 10.

12 **V. SAVE-A-WATT IS NOT IN THE PUBLIC INTEREST AND ITS**
13 **INCENTIVE STRUCTURE IS NOT APPROPRIATE**

14
15 **Q. PLEASE DESCRIBE THE STANDARD THAT THE COMPANY PROPOSAL**
16 **MUST MEET IN ORDER TO BE APPROVED, AND THE CRITERIA THAT**
17 **THE COMMISSION MUST CONSIDER WHEN APPLYING THAT STANDARD.**

18 **A.** Counsel advises me that the Commission must evaluate the Company proposal relative to
19 several criteria pursuant to Commission Rule R8-68(e), including whether it is in the
20 public interest and whether it encourages energy efficiency. In addition I am advised that
21 the Commission must determine whether the proposed incentive structure is appropriate,

⁸ Public Utilities Commission of Ohio, Docket 06-91-EL-UNC et al., Order issued July 11, 2007.

1 as defined by N.C.G.S. § 62-1338(d)(2). My understanding is that the Company has the
2 burden of proving that its proposal meets these various criteria.

3 **Q. DOES THE COMPANY IMPLY THAT SAVE-A-WATT MEETS THESE**
4 **CRITERIA?**

5
6 A. Yes. In her Direct Testimony, on page 12, Ms. Ruff indicates that approval of the
7 Company's "energy efficiency plan" would advance the policy of North Carolina. She then
8 refers to the specific goals of Session Law 2007-397, which include encouraging private
9 investment in energy efficiency and providing improved air quality. Later, on page 14, she states
10 that the Energy Efficiency Plan provides "...reduced costs and reduced environmental benefits."

11 **Q. HAS THE COMPANY PROVIDED ANY QUANTITATIVE ANALYSES, OR**
12 **GUARANTEES, THAT UNDER SAVE-A-WATT IT WILL ACHIEVE HIGHER**
13 **ENVIRONMENTAL BENEFITS THAN UNDER A COST-OF-SERVICE BASED**
14 **RATEMAKING FRAMEWORK?**

15 A. No. According to Company witness Rogers (Direct Testimony, page 3), save-a-watt is
16 predicated on an aspiration to help "de-carbonize" the economy. However, the save-a-
17 watt aspiration regarding carbon appears to be just that—an aspiration—since the
18 Company has not set any specific targets or metrics to meet goals of being the lowest
19 carbon service territory in the United States (see Hornby Exhibit 12, which reflects
20 Company responses to a Coalition data request on this point).

21 **Q. HAS THE COMPANY PROVIDED ANY QUANTITATIVE ANALYSES, OR**
22 **GUARANTEES, THAT UNDER SAVE-A-WATT IT WILL ACHIEVE HIGHER**
23 **REDUCTIONS IN ANNUAL ENERGY THAN UNDER A COST-OF-SERVICE**
24 **BASED FRAMEWORK?**

25 A. No. According to Company witness Rogers (Direct Testimony, page 3), save-a-watt is
26 also predicated on an aspiration to help create the most energy-efficient economy in the

1 world. Again, the save-a-watt aspiration to be the most energy-efficient appears to be no
2 more than an aspiration, since the Company has set no specific targets or metrics to meet
3 goals of being the most energy efficient service territory in the United States (see Hornby
4 Exhibit 12, which reflects Company responses to Coalition a data request on this point).

5 Moreover, the reductions in annual energy use that the Company is actually
6 projecting to achieve under save-a-watt fall far short of that worthy goal. As noted
7 earlier, by the fourth year of its programs Duke is projecting reductions in annual energy
8 equivalent to only 0.5 % of its forecast of annual energy sales for 2011. That reduction
9 by 2011 reflects the cumulative impact of “first year” or incremental reductions
10 equivalent to about **0.14%** per year of annual sales in each of the four years. In contrast,
11 utilities in several other states are achieving annual incremental reductions several times
12 greater than that, *i.e.*, incremental annual reductions each year equal to **1%** of annual
13 sales. Those reductions being achieved in several other states are presented in Hornby
14 Exhibit 11.

15 **Q. CAN THE COMPANY JUSTIFY ITS LOWER LEVELS OF PROJECTED**
16 **SAVINGS ON THE GROUNDS THAT ITS AVOIDED ENERGY COSTS ARE**
17 **SIGNIFICANTLY LOWER THAN THOSE OF THE UTILITIES IN THESE**
18 **OTHER STATES?**

19 A. No. The Company is facing the same factors driving increases in avoided energy costs,
20 *i.e.* increases in prices of coal and natural gas as well as impending national regulation on
21 carbon emissions. Second, the Company is projecting its annual energy requirements to
22 increase and, in the absence of significant reductions in annual energy use, is considering
23 the same supply-side choices as utilities in other states in order to meet that load growth.

1 According to the Company's November 15, 2007 Annual Energy Plan, at page 4, the
2 supply-side resources it is considering in addition to the construction of the Cliffside 6
3 unit include new gas-fired combined cycle gas turbines, new nuclear capacity and new
4 utility scale renewable capacity. The capital costs of new fossil and nuclear capacity
5 units are much higher than in the past and are increasing rapidly.⁹ Thus, the Company is
6 facing the same long-term costs of capacity and energy as utilities in other states.

7 **Q. RELATIVE TO A COST-BASED RATEMAKING FRAMEWORK, DOES SAVE-**
8 **A-WATT PROVIDE A STRONGER FINANCIAL INCENTIVE TO PURSUE ALL**
9 **REDUCTIONS IN ANNUAL ENERGY THAT ARE AVAILABLE AT LESS**
10 **THAN AVOIDED COST, AND HENCE A STRONG INCENTIVE TO AVOID**
11 **CONSTRUCTION OF NEW BASELOAD GENERATION?**

12 A. No. Under a cost-based ratemaking framework, a revenue adjustment mechanism to
13 address under-collection of revenues due to energy efficiency reductions can be
14 independent of both avoided costs and program costs. Under that approach, once a utility
15 demonstrates that its cost of saved energy is less than its avoided energy costs, the energy
16 efficiency program can be approved and the program costs recovered through a rate rider.
17 The Commission may also approve separate rate mechanisms to fund recovery of lost
18 revenues and a financial incentive for performance.

19 In contrast, under save-a-watt, the amount of funding available to compensate the
20 Company for its under-collection of revenues due to energy efficiency reductions is
21 dependent on both its avoided costs and its program costs, as its total compensation is
22 limited to 90 percent of avoided costs. Under save-a-watt, every dollar the Company

⁹ See, for example, Office of Enforcement, *Increasing Costs in Electric Markets*, Federal Energy Regulatory

1 spends on program costs is a dollar that is not available to fund compensation for under-
2 collected revenues. Thus, for reductions whose program costs are close to their avoided
3 costs, save-a-watt does not provide a stronger financial incentive than a cost-of-service
4 ratemaking framework.

5 This critical flaw in the design of save-a-watt may help explain why the Company
6 is proposing such low reductions in annual energy. The Company's estimates of the
7 economics of reductions from energy efficiency are summarized in the "energy
8 efficiency" columns (labeled "c" and "d") of Confidential Hornby Exhibit 2. These
9 economics hinge upon the Company's estimates of avoided energy costs, energy
10 efficiency program costs and net lost revenues from energy efficiency. According to
11 these estimates the Company expects to lose a significant amount of money due to
12 reductions in annual energy, as indicated in row 28 of column c. Thus, according to the
13 Company's estimates of avoided energy costs and net lost revenues, save-a-watt does not
14 provide it a strong financial incentive to avoid baseload generation by pursuing all cost-
15 effective reductions in annual energy.

16 **Q. DO YOU HAVE ANY CONCERNS REGARDING THE COMPANY'S**
17 **ESTIMATES OF AVOIDED ENERGY COSTS AND NET LOST REVENUES?**

18 **A.** Yes.

19 First, the Company's estimated avoided energy costs seem low in light of its
20 apparent plans to add new baseload and intermediate generation from some combination
21 of new gas-fired combined-cycle capacity, new coal capacity and new nuclear capacity.

1 Under its 2007 Annual Plan Reference Case, the Company is proposing to add 4,400 MW
2 of new peaking and intermediate capacity between 2010 and 2017.¹⁰ To the extent that a
3 significant portion of that capacity will be new gas-fired combined cycle plants, the
4 Company's estimated avoided energy costs seem low in light of recent projections of
5 capital costs and natural gas prices. The Company has not prepared any analyses of the
6 magnitude of energy efficiency reductions that would be required to delay or avoid these
7 proposed capacity additions. See Hornby Exhibit 12, which reflects Company responses
8 to Coalition data requests on this point.

9 Second, the Company's estimates of net lost revenues seem high relative to the
10 energy charges (\$/kWh) in its existing tariffs. The Company is using those tariff energy
11 charges, I assume, to collect revenues to recover its embedded costs of generation and
12 transmission, as well as to recover distribution service costs. Since the Company is
13 proposing to acquire significant additional capacity to meet projected load growth, it
14 appears that reductions in customer annual energy use will not cause any long-term under
15 collection of the embedded costs of its existing generation and transmission capacity.
16 Instead, reductions in annual energy will simply "free up" existing generation and
17 transmission capacity which the Company can then use to help meet incremental load.
18 Thus, the Company should be able to recover the embedded costs associated with any
19 existing generation capacity freed up by energy efficiency reductions from incremental
20 load. I expect that the level of net lost revenues would be much lower if the embedded

¹⁰ Duke Energy Carolinas Annual Plan, November 15, 2007, page 46

1 cost of existing generation and transmission capacity were removed from the Company's
2 estimates.

3 **Q. WOULD IT BE POSSIBLE TO DEMONSTRATE THAT ONE RATEMAKING**
4 **APPROACH IS SUPERIOR TO ANOTHER IN TERMS OF ACHIEVING THE**
5 **SAME OR GREATER REDUCTIONS IN PEAK DEMAND AND ENERGY AT**
6 **REVENUE REQUIREMENTS EQUAL TO OR LESS THAN UNDER A COST-**
7 **OF-SERVICE FRAMEWORK?**

8 A. Yes. A comparison of the simulated compensation for DSM program reductions under a
9 cost-based ratemaking framework and under save-a-watt would help to demonstrate that
10 one approach is superior, in terms of achieving the same or greater reductions in peak
11 demand and energy at revenue requirements equal to or less than under a cost-of service
12 framework. One of the lessons regarding approaches to this issue stated in the NAPEE
13 report by ICF is:

14 *Test prospective policies. Complex mechanisms that have many moving parts*
15 *cannot easily be understood unless the performance of the mechanism is*
16 *simulated under a wide range of conditions. This is particularly true of*
17 *mechanisms that rely on projections of avoided costs, prices or program impacts.*
18 *Simulation of impacts using financial models and/or use of targeted pilots can be*
19 *effective tools to test prospective policies.¹¹*

20 **Q. HAS THE COMPANY PROVIDED ANY SIMULATIONS OR QUANTITATIVE**
21 **ANALYSES THAT DEMONSTRATE SAVE-A-WATT WILL ACHIEVE THE**
22 **SAME OR GREATER REDUCTIONS IN PEAK DEMAND AND ENERGY AT**
23 **REVENUE REQUIREMENTS EQUAL TO OR LESS THAN UNDER A COST-**
24 **OF-SERVICE FRAMEWORK?**

¹¹ Jensen, Val (ICF International). *Aligning Utility Incentives with Investment in Energy Efficiency*, National Action Plan for Energy Efficiency, November 2007, page ES-11

1 A. No. The Company did not prepare any quantitative analyses comparing revenue
2 requirements under save-a-watt and under a cost-of-service based framework for a given
3 quantity of reductions in peak demand and energy. See responses to Coalition data
4 requests 1-14, 1-61, 1-65, 1-69, 1-70 g, 1-72 b and 1-75 in Hornby Exhibit 12.

5 **Q. HAVE YOU PREPARED ANY QUANTITATIVE ANALYSES COMPARING**
6 **REVENUE REQUIREMENTS UNDER SAVE-A-WATT TO REVENUE**
7 **REQUIREMENTS UNDER A COST-OF-SERVICE RATEMAKING**
8 **FRAMEWORK?**

9 A. Yes. I have prepared comparisons of the revenue requirements under the two approaches
10 for two types of reductions under DSM programs as well as for a general rate case
11 scenario. The results of these analyses indicate that, for the same types and quantity of
12 reductions evaluated, the revenue requirements under the save-a-watt proposal would be
13 higher than revenue requirements under a cost-of-service based ratemaking framework.

14 The Company will be able to use the revenues that it collects under save-a-watt as
15 compensation for the same three components it would be funding under the cost-of-
16 service ratemaking framework currently provided for in North Carolina. Those three
17 components are DSM program costs, lost revenues and a share of the net savings.

18 Thus, one can use a common set of illustrative assumptions regarding avoided
19 costs and each of those three components to calculate the revenue requirements under a
20 cost-of-service ratemaking approach and under save-a-watt. For the cost-of-service
21 ratemaking approach in my examples I assume a utility incentive equal to 10% of net
22 savings, where net savings equals avoided costs minus DSM program costs. This

1 incentive is comparable to the shared saving incentive under which Duke Energy Ohio is
2 operating as well as the shared saving incentive recently approved in California.

3 **Q. ARE REVENUE REQUIREMENTS UNDER SAVE-A-WATT LIKELY TO BE**
4 **HIGHER THAN REVENUE REQUIREMENTS UNDER A COST-OF-SERVICE**
5 **RATEMAKING FRAMEWORK FOR VARIOUS TYPES OF REDUCTIONS?**

6 A. Yes. Revenue requirements are likely to be higher under save-a-watt for various types of
7 reductions because of the absence of a connection between the revenue requirements that
8 the Company would collect and the Company's actual program costs and its actual net
9 lost revenues as well as the absence of a cap on its share of net savings. Revenue
10 requirements under save-a-watt would or could be higher than revenue requirements
11 under a cost-of-service framework for reductions in peak demand where there are no lost
12 revenues and for reductions in annual energy for higher cost measures when avoided
13 energy costs increase over time. The revenue requirements could also be higher under
14 save-a-watt after the Company's base rates are reset in a general rate case.

15 **Q. PLEASE EXPLAIN HOW SAVE-A-WATT PRODUCES REVENUE**
16 **REQUIREMENTS THAT ARE HIGHER THAN THEY WOULD BE UNDER A**
17 **COST-OF-SERVICE RATEMAKING FRAMEWORK FOR REDUCTIONS IN**
18 **PEAK DEMAND WHERE THERE ARE NO LOST REVENUES.**

19 A. Revenue requirements for reductions from a measure under save-a-watt are the same
20 regardless of whether the reduction actually results in lost revenues for the utility. In
21 contrast, revenue requirements for reductions from measures under a cost-of-service
22 approach, such as that provided by current North Carolina regulation, are lower if that
23 reduction does not cause lost revenues. I illustrate the difference in revenue requirements

1 between the save-a-watt approach and a cost-of-service approach for this situation using a
2 bar chart in Hornby Exhibit 7.

- 3 • The first bar in that chart is the avoided cost.
- 4 • The second bar illustrates the distribution of the savings between the utility and
5 customers under a cost-of-service approach. The utility share is the bottom, solid
6 segment of the bar. That amount represents direct program costs, no net lost
7 revenues since there are none, and a 10% share of the net savings. The customer
8 share, which is the majority of the savings, is the top, left-to-right diagonal cross-
9 hatch segment of the bar.
- 10 • The third bar illustrates the distribution of the savings between the utility and
11 customers under the save-a-watt approach. Again, the utility share is the bottom,
12 solid segment of the bar. That amount represents 90% of avoided costs. In
13 contrasts, customers receive only 10% of avoided costs.

14 **Q. PLEASE EXPLAIN HOW SAVE-A-WATT COULD PRODUCE REVENUE**
15 **REQUIREMENTS THAT ARE HIGHER THAN THEY WOULD BE UNDER A**
16 **COST-OF-SERVICE RATEMAKING FRAMEWORK FOR REDUCTIONS IN**
17 **ANNUAL ENERGY AS AVOIDED COSTS INCREASE OVER TIME.**

18 A. There may be a sub-set of reductions in annual energy for which revenue requirements
19 under save-a-watt will be similar to revenue requirements under a cost-of-service
20 approach as currently provided for in North Carolina. However, for that sub-set of
21 reductions, there is a definite potential for save-a-watt to produce higher revenue
22 requirements over time, as avoided energy costs increase. Again, I illustrate the

1 difference in revenue requirements between these two approaches for this situation using
2 bar charts on in Hornby Exhibit 8.

3 The first three bars provide illustrative costs, savings and revenue requirements
4 for measure “X” for vintage year 1. The first bar is the avoided energy cost for vintage
5 year 1. The second bar illustrates the distribution of the savings between the utility and
6 customers under a cost-of-service approach. The utility compensation, represented in the
7 bottom, solid segment of the bar represents direct program costs, net lost revenues and a
8 10% share of the net savings. The customer share is the top, left-to-right downward
9 diagonal cross-hatch segment of bar. The third bar illustrates the distribution of the
10 savings between the utility and customers using the save-a-watt approach. Again, the
11 utility compensation is the bottom, solid segment of the bar. Under save-a-watt this
12 represents 90% of avoided costs. Again, the customer share, 10%, is the top, left-to-right
13 diagonal cross-hatch segment of the bar.

14 The next three bars provide illustrative costs, savings and revenue requirements
15 for the same measure “X”. The assumption is that measure X is installed at another
16 customer’s site in vintage year 2 at the same program cost and the same net lost revenue
17 as in vintage year 1.¹²

- 18 • The fourth bar is the avoided cost for vintage year 2 which reflects an assumed
19 10% increase over vintage year 1 avoided costs (left-to-right upward diagonal

¹² The Company has provided no evidence to indicate that direct program costs would increase in the same proportion as increases in avoided costs. Response Coalition 1-47 a in my Exhibit 12.

1 segment). This is only difference in cost between vintage year 1 and vintage year
2 2.

- 3 • The fifth bar is the vintage year 2 distribution of savings under a cost-of-service
4 approach. It illustrates that, under such a cost-of-service approach, almost all of
5 the 10% increase in avoided cost goes to customers as additional savings under
6 the shared savings component of that approach (top, vertical cross-hatch segment
7 of bar).
- 8 • The sixth bar illustrates that, under save-a-watt, almost all of the 10% increase in
9 avoided cost goes to the utility as higher earnings (bottom, solid segment of the
10 bar).

11 **Q. IS IT LIKELY THAT AVOIDED ENERGY COSTS FOR VINTAGE YEARS 2, 3**
12 **AND 4 WILL BE HIGHER THAN THE VINTAGE YEAR 1 AVOIDED ENERGY**
13 **COSTS THE COMPANY HAS USED IN ITS FILING?**

14 **A.** Yes. My understanding is that every year the Company will file updated estimates of
15 avoided energy costs for the upcoming vintage year. For example it will file updated
16 avoided energy costs for vintage year 2. These updated estimates of avoided energy costs
17 for vintage year 2 and beyond are likely to be higher than vintage year 1 avoided costs.
18 The increases in the avoided energy costs for those future vintage years will be driven by
19 increases in prices for coal and natural gas. They will also increase when regulations on
20 carbon emissions are eventually implemented, as indicated in the Company's response to
21 Coalition data request 1-21 b in Hornby Exhibit 12.

22 **Q. PLEASE EXPLAIN HOW SAVE-A-WATT COULD PRODUCE REVENUE**
23 **REQUIREMENTS THAT ARE HIGHER THAN THEY WOULD BE UNDER A**

1 **COST-OF-SERVICE RATEMAKING FRAMEWORK AFTER THE**
2 **COMPANY'S BASE RATES ARE RESET AS A RESULT OF A GENERAL**
3 **RATE CASE.**

4 A. In a general rate case the Company resets its base rates to reflect the annual kWh sales in
5 its "test year." Those new base rates therefore are set to recover the Company's revenue
6 requirements from the new, lower level of annual sales due to reductions that have
7 occurred since the last rate case. In effect, recovery of "lost revenues" is shifted from
8 the DSM rider into the new base rates.

9 Under the "vintage" aspect of save-a-watt, once revenue requirements for a
10 particular vintage year are set, the rates set to collect those revenue requirements remain
11 in place for the life of those vintage reductions. As a result, it appears that save-a-watt
12 rates for vintage years prior to the base rate would be unaffected by the base rate case,
13 and would effectively continue to collect "net lost revenues." In contrast, under a cost-
14 of-service approach, a rate rider recovering under collections of revenues due to energy
15 efficiency reductions would be reduced after the general rate case to reflect the
16 adjustment to base rates.

17 I illustrate the potential for rates under save-a-watt to be higher than rates under
18 the current cost-of-service approach after a general rate case in Hornby Exhibit 9. In this
19 example, I assume the utility is collecting essentially the same revenue requirements
20 under both save-a-watt and such a cost-of-service ratemaking framework for reductions
21 in vintage years 2008, 2009 and 2010. I also assume the Company completes a general
22 rate case in 2010 that sets new base rates effective 2011. The new base rates would be

1 higher to reflect the reduction in annual kWh due to the reductions in annual energy from
2 the energy conservation measures implemented in 2008, 2009 and 2010. As a result, the
3 Company would no longer have “net lost revenues” from the reductions due to the
4 measures implemented in years 2008 through 2010.

5 The chart in Hornby Exhibit 9 shows the rates that the utility would collect year
6 by under both save-a-watt (solid) and cost-of-service (black and white diamonds) over
7 the lives of the measures. The rates under save-a-watt are unaffected by the base rate
8 case. The rates under a cost-of-service approach decline from 2011 onward to reflect the
9 new base rates from the general rate case in 2010.

10 **Q. DO ANY OF THE COMPANY WITNESSES DISCUSS HOW RATES UNDER**
11 **SAVE-A-WATT WILL BE AFFECTED BY NEW BASE RATES FROM A**
12 **GENERAL RATE CASE?**

13 A. No. In their pre-filed direct testimony, none of the Company witnesses discuss how rates
14 under save-a-watt will be affected by new base rates from a general rate case. In
15 response to Coalition data request 3.6, presented in Hornby Exhibit 12, the Company has
16 indicated that it considers this possibility to be hypothetical and states that it cannot
17 speculate on how the two ratemaking mechanisms would interact.

18 **Q. IS THE COMPANY PROPOSING TO ALWAYS REPORT ITS ACTUAL**
19 **EARNINGS FROM SAVE-A-WATT REVENUES TO THE COMMISSION?**

20 A. No. The Company is proposing to report its earnings from save-a-watt revenues based
21 upon the higher of its actual program costs or ninety percent of avoided costs. Thus, it
22 appears that when its actual program costs are less than ninety percent of avoided costs
23 the Company will not be reporting its actual earnings from save-a-watt revenues to the

1 Commission. See Company response to Coalition data request 3.7 presented in Hornby
2 Exhibit 12.

3 **Q. HAVE YOU REVIEWED THE SHARING OF SAVINGS BETWEEN THE**
4 **CUSTOMER AND THE COMPANY UNDER SAVE-A-WATT?**

5 A. Yes. Many cost-based ratemaking frameworks have some form of positive financial
6 incentive. One form of incentive is a sharing of the savings after recovery of program
7 costs, *i.e.*, avoided costs minus program costs. I have analyzed the sharing of savings
8 between customers and the Company under save-a-watt based on the data provided in
9 Stevie Confidential Exhibit 4. That analysis indicates that, for the mix and quantities of
10 reductions the Company is projecting, it would receive a higher share of savings under
11 save-a-watt than under the shared savings mechanisms in other states, Ohio and
12 California for example. That analysis also indicates that, according to the Company's
13 assumptions regarding avoided costs, program costs and lost revenues, it is not receiving
14 any share of savings for reductions in annual energy. Its portion of savings result from
15 the compensation it receives for reductions in peak demand. Those results highlight the
16 importance of verifying the projections of lost revenues. They also confirm that save-a-
17 watt does not provide as strong an incentive for reductions in annual energy as a cost-of-
18 service ratemaking framework.

19 Under cost-based-ratemaking frameworks, such as the current framework in
20 North Carolina, financial incentives to utilities tend to be based upon an estimate as to
21 what is "reasonable." One approach is to set the incentive at a percentage of direct
22 program cost, *e.g.* 10%. Another approach is to set the incentive as a percentage of the

1 net savings after recovery of direct program costs and net lost revenue. California goes
2 even further by establishing an incentive mechanism “curve,” with incentives for meeting
3 or exceeding explicit performance targets and penalties for failing to meet a minimum
4 level of performance.¹³

5 In both California and Ohio, the shared savings incentive mechanism has several
6 components. Those components include an explicit target, a minimum threshold of
7 performance relative to that target, *e.g.* 65%, before the utility receives any share of
8 savings, and a cap on the maximum share expressed as a percentage, or a percentage and
9 an absolute amount. The maximum percentages that the utility can earn are in the range
10 of 10% to 12%.

11 Under save-a-watt, the Company’s share of savings, *i.e.*, after recovery of
12 program costs, would be approximately 81%. Those levels of sharing, and the sharing
13 curves for California and Ohio, are presented in Hornby Exhibit 10.

14 **Q. PLEASE SUMMARIZE YOUR MAJOR CONCLUSIONS AFTER REVIEWING**
15 **THE COMPANY’S PROPOSAL.**

16 A. The Company’s save-a-watt proposal is not in the public interest and its incentive
17 structure is not appropriate, for several reasons.

- 18 • First, the Company could achieve the same reductions in annual energy use at the
19 same or lower revenue requirements under the cost-of-service based framework
20 currently provided for in North Carolina.

¹³ Public Utilities Commission of the State of California, Docket 06-04-010, Interim Opinion, September 25, 2007.

1 • Second, under save-a-watt the Company is requesting that its acquisition of
2 reductions via demand-side management and energy efficiency be treated more
3 favorably than its acquisition of supply from a ratemaking perspective. The
4 Company wants to be compensated on a value-of-service basis rather than a cost-
5 of-service basis. Moreover, the margin between the “value” of these reductions
6 and the cost of acquiring them is likely to increase over time, as avoided energy
7 costs are expected to increase more rapidly than the actual cost of acquiring
8 reductions in annual energy. The Company also apparently wants to under-report
9 its earnings from save-a-watt revenues during periods when its actual program
10 costs are less than those revenues. Despite requesting this favorable ratemaking
11 treatment the Company is proposing to achieve a low level of reductions in annual
12 energy and associated air emissions compared to leading utilities in other states,
13 who are achieving and/or proposing to achieve 3 to 7 times greater reductions in
14 annual energy use, i.e., incremental or first year reductions of 1% to 2% of annual
15 sales.

16 • Third, according to the Company’s estimates of avoided energy costs and net lost
17 revenues, save-a-watt does not provide it a strong financial incentive to avoid
18 baseload generation by pursuing all cost-effective reductions in annual energy.

19 **Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS.**

20 A. I recommend that the Commission reject the Company’s request and instead require the
21 Company to file a new application. In that new application, the Company should be

1 encouraged to propose a ratemaking framework, consistent with Commission rules, that
2 will remove the disincentive to promote energy efficiency and provide the Company with
3 a strong financial incentive to avoid construction of new generation by pursuing all cost-
4 effective reductions in annual energy, and to propose a set of energy efficiency programs
5 to achieve that goal. In its new filing the Company should be required to “unbundle” its
6 net lost revenues into generation, transmission and distribution service components.

7 If the Commission does not reject the Company’s request, I recommend that it
8 require the Company to report its earnings on save-a-watt revenues based upon its actual
9 program costs.

10 **Q. DOES THIS COMPLETE YOUR TESTIMONY?**

11 **A. Yes.**

James Richard Hornby

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Synapse Energy Economics, Inc.
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PROFESSIONAL EXPERIENCE

Synapse Energy Economics, Inc., Cambridge, MA. *Senior Consultant*, 2006 to present.
Analysis and expert testimony regarding planning, market structure, ratemaking and contracting issues in the electricity and natural gas industries.

Charles River Associates (formerly Tabors Caramanis & Associates), Cambridge, MA.

Principal, 2004-2006.

Senior Consultant, 1998-2004.

Provided expert testimony and litigation support in several energy contract price arbitration proceedings, as well as in electric and gas utility ratemaking proceedings in Ontario, New York, Nova Scotia and New Jersey. Managed a major productivity improvement and planning project for two electric distribution companies within the Abu Dhabi Water and Electricity Authority. Analyzed a range of market structure and contracting issues in wholesale electricity markets.

Tellus Institute, Boston, MA.

Vice President and Director of Energy Group, 1997-1998.

Presented expert testimony on rates for unbundled retail services in restructured retail markets and analyzed the options for purchasing electricity and gas in those markets.

Manager of Natural Gas Program, 1986-1997.

Prepared testimony and reports on a range of gas industry issues including market structure, unbundled services, ratemaking, strategic planning, market analyses, and supply planning.

Nova Scotia Department of Mines and Energy, Halifax, Canada; 1981-1986

Member, Canada-Nova Scotia Offshore Oil and Gas Board, 1983-1986

Member of a federal-provincial board responsible for regulating petroleum industry exploration and development activity offshore Nova Scotia.

Assistant Deputy Minister of Energy 1983-1986

Responsible for analysis and implementation of provincial energy policies and programs, as well as for Energy Division budget and staff. Directed preparation of comprehensive energy plan emphasizing energy efficiency and use of provincial energy resources. Senior technical advisor on provincial team responsible for negotiating and implementing a federal/provincial fiscal, regulatory, and legislative regime to govern offshore oil and gas. Directed analyses of proposals to develop and market natural gas, coal, and tidal power resources. Also served as Director of Energy Resources (1982-1983) and Assistant to the Deputy Minister (1981-1982).

Nova Scotia Research Foundation, Dartmouth, Canada, Consultant, 1978–1981
Edited Nova Scotia's first comprehensive energy plan. Administered government-funded industrial energy conservation program—audits, feasibility studies, and investment grants.

Canadian Keyes Fibre, Hantsport, Canada, Project Engineer, 1975–1977

Imperial Group Limited, Bristol, England, Management Consultant, 1973–1975

EDUCATION

M.S., Technology and Policy (Energy), Massachusetts Institute of Technology, 1979.
Thesis: "An Assessment of Government Policies to Promote Investments in Energy Conserving Technologies"

B.Eng. Industrial Engineering (with Distinction), Dalhousie University, Canada, 1973

EXPERT TESTIMONY AND LITIGATION SUPPORT (1987 to present)

Provided expert testimony and/or litigation support on planning, market structure, ratemaking and gas supply/fuel procurement in the electric and gas industries in approximately 100 proceedings in over thirty jurisdictions in the United States and Canada. List of proceedings available upon request.

Redacted

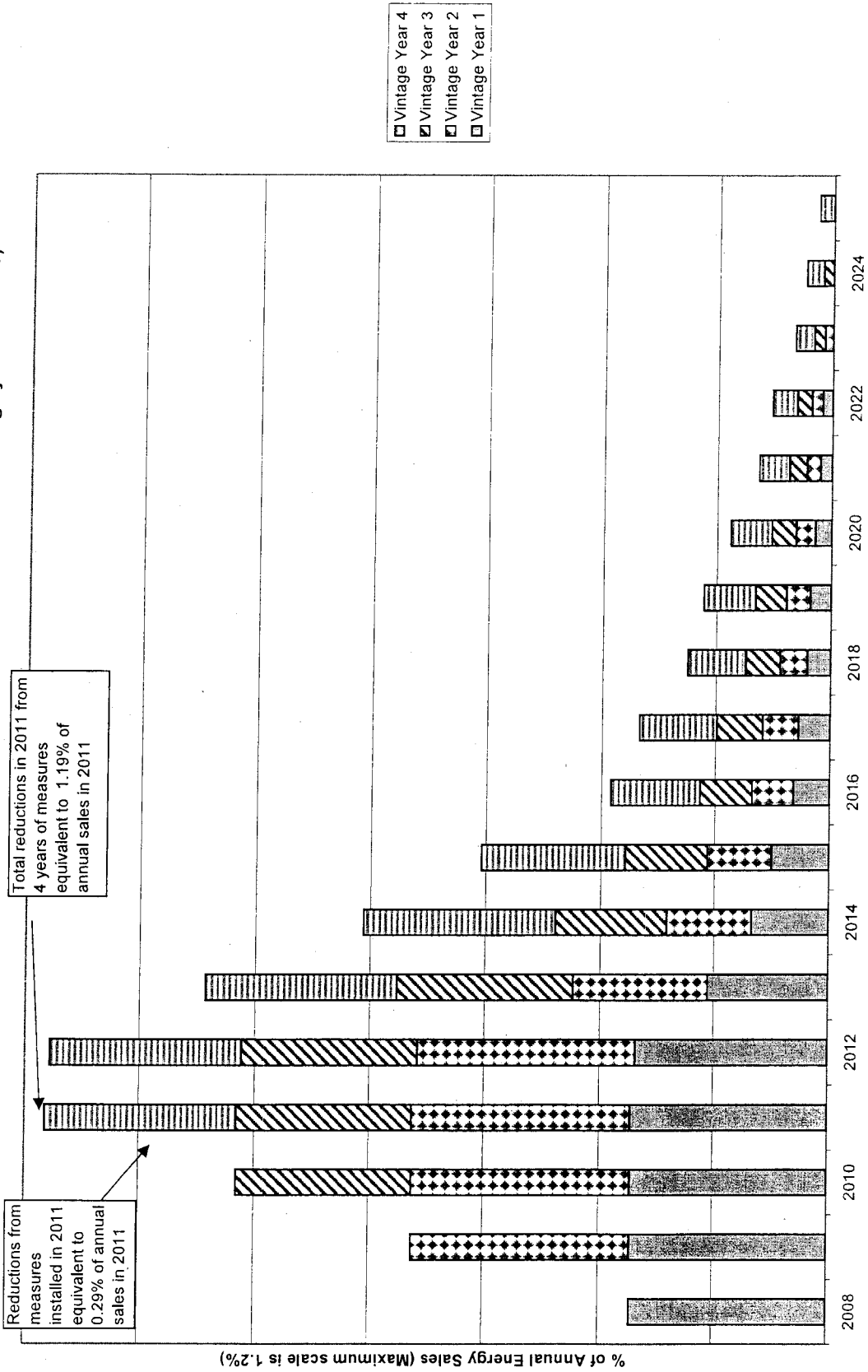
Summary of Save-a-Watt Proposal - Costs and Results

	Demand Response		Energy Efficiency		Total	
	absolute a	% b	absolute c	% d	absolute e	% f
1 DSM Program Costs						
2 Direct Cost in Years 1-4 (Present Value)\$ ²						
3 Peak Demand and Energy Savings		54%		46%		100%
4 Peak Demand (kW)						
5 Peak Demand Forecast for 2011 (kW) ¹						
6 First Year Peak Demand Savings from Year 4 Efforts (kW) ³						
7 Annual Peak Demand Savings in Year 4 from Efforts in Years 1-4 (kW) ³						7.1%
8 Energy (kWh)						7.8%
9 Energy Forecast for 2011 (kWh) ¹						
10 First Year Energy Savings from Year 4 Efforts (kWh) ³						
11 Annual Energy Savings in Year 4 from Efforts in Years 1-4 (kWh) ³						0.29%
12 Value of Peak Demand and Energy Savings (100% of Avoided Costs)						1.19%
13 2008 Vintage Avoided Capacity Cost (Present Value)\$/kW-yr						
14 2008 Vintage Avoided Energy Cost (Present Value)\$/kWh						
15 Average Cost of Saved Capacity and Energy						
16 Saved Capacity in Years 1-4 (kW) ⁴						
17 Cost of Saved Capacity (Present Value)\$/kW-yr		81%		19%		
18 Lifetime Saved Energy (kWh) ⁵						
19 Cost of Lifetime Saved Energy (Present Value)\$/kWh		0%		100%		
20 Shared Savings Value (accounting for Recovery of Program Costs)						
21 Customer Value = 10% of Avoided Costs	Present Value \$/kW-yr		Present Value \$/kWh		Present Value\$	
22 Company Value = 90% of Avoided Cost - Recovered Program Costs		22%		17%		19%
23 Total Value		78%		83%		81%
24 Net Lost Revenues		100%		100%		100%
25 Present Value \$/kW-yr	Present Value \$/kW-yr		Present Value \$/kWh		Present Value\$	
26 Net Savings (After Recovery of Program Costs and Net Lost Revenues)						
27 Customer Value = 10% of Avoided Cost (Present Value)\$						
28 Company Value = 90% of Avoided Cost - Recovered Program Costs - Recovered Net Lost Revenues (Present Value)\$						
29 Total Value (Present Value)\$						

Notes:

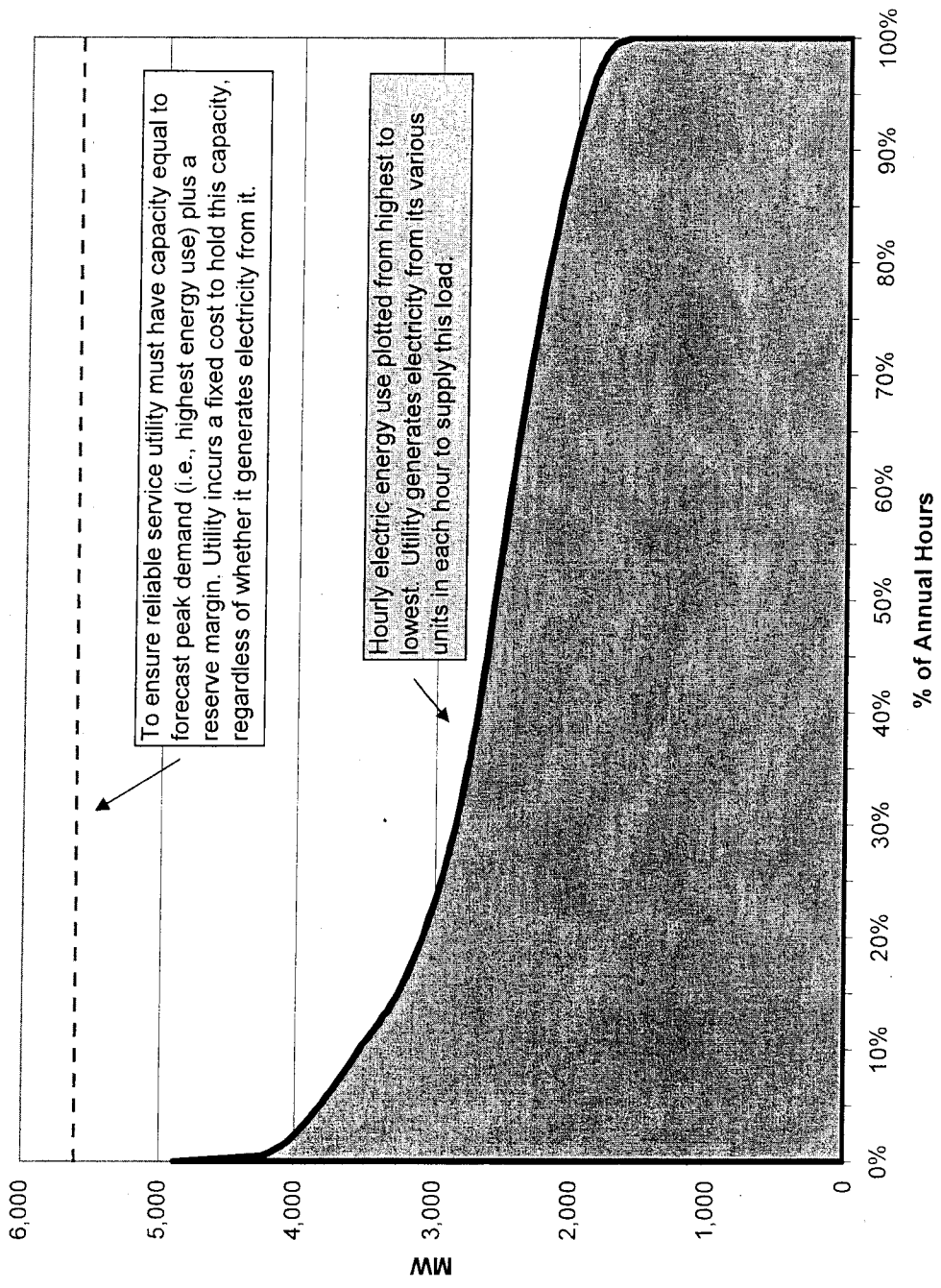
- 1 In general, references to 'Year 1' are assumed to be 2008 and references to 'Year 4' are assumed to be 2011
- 2 Peak demand and energy forecasts do not take into account savings from save-a-watt
- 3 Direct program cost excludes recovery of net lost revenues and/or financial incentive to utility
- 4 'First year' reductions in year 4 are incremental reductions resulting from measures implemented in year 4
- 5 Annual reductions in year 4 include incremental reductions resulting from measures implemented in year 4 as well as continued reductions in year 4 resulting from measures implemented in previous years
- 6 Saved capacity includes 2008-2032 for energy efficiency programs, but only 2008-2011 for demand response as it is assumed that the impact of demand response does not persist over a number of years as with energy efficient
- 7 Saved energy includes 2008-2032 for energy efficiency programs, no saved energy was claimed for demand response programs

Projected Reductions in annual energy by "vintage year" (assumes vintage year 1 is 2008)



Electric Capacity and Energy for an Illustrative Year and Utility

Reference Case



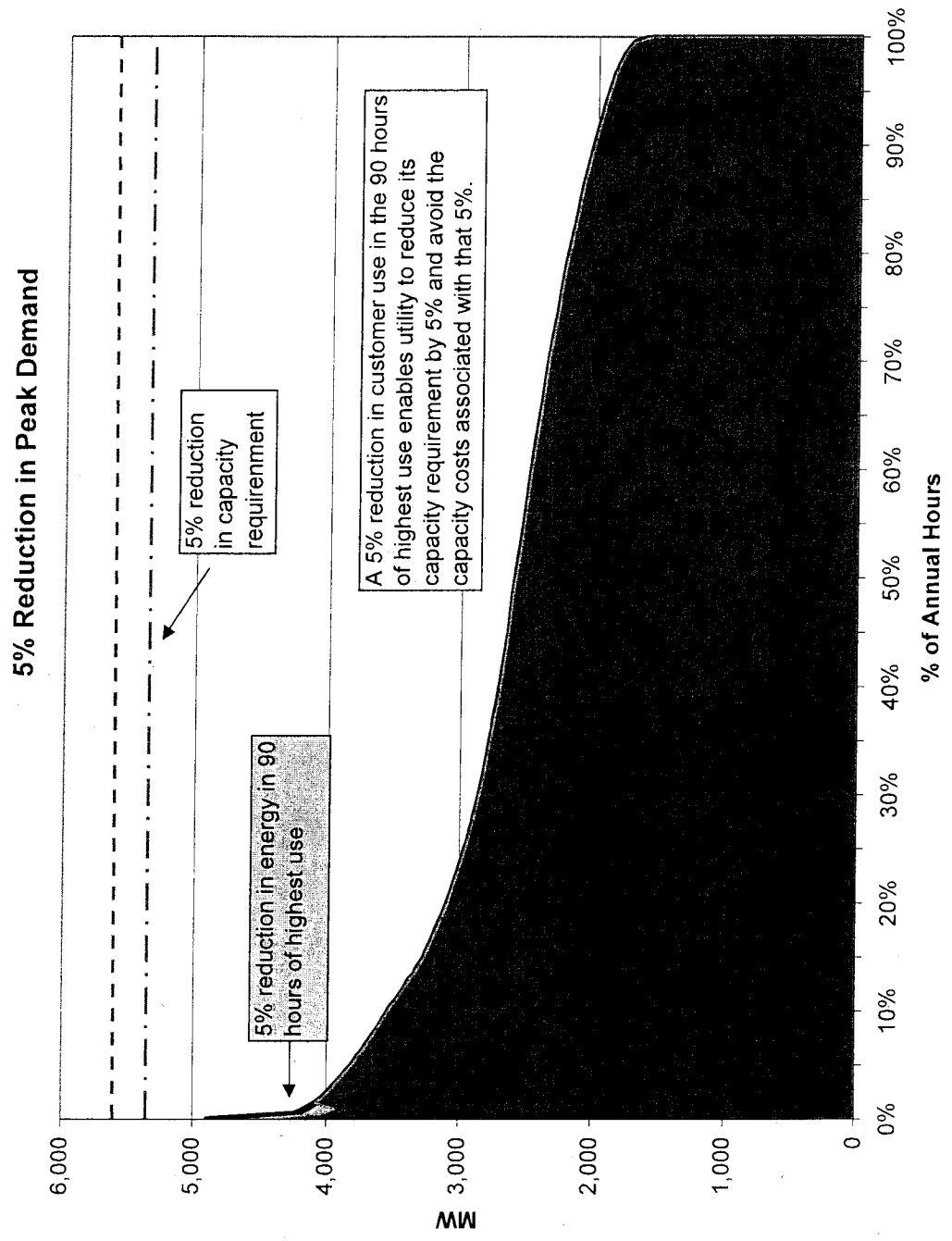
To ensure reliable service utility must have capacity equal to forecast peak demand (i.e., highest energy use) plus a reserve margin. Utility incurs a fixed cost to hold this capacity, regardless of whether it generates electricity from it.

Hourly electric energy use plotted from highest to lowest. Utility generates electricity from its various units in each hour to supply this load.

■ Hourly Electric Energy (MWh) - Reference Case

Capacity Requirement (MW) - Reference Case

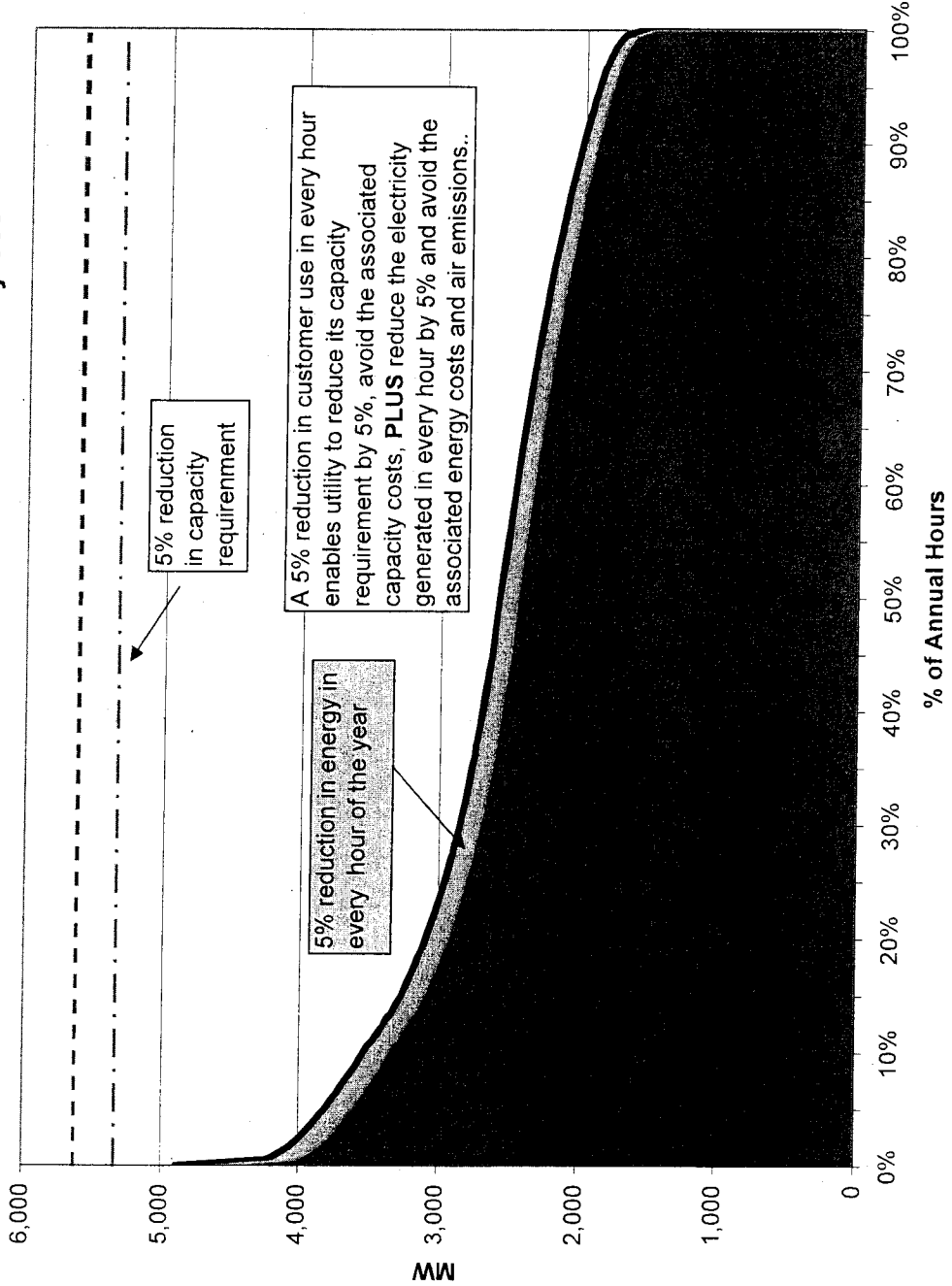
Electric Capacity and Energy for an Illustrative Year and Utility



■	Hourly Electric Energy (MWh) - Reference Case
■	Capacity Requirement (MW) - Reference Case
■	Hourly Electric Energy (MWh) - Peak Reduction Case
■	Capacity Requirement (MW) - Peak reduction Case

Electric Capacity and Energy for an Illustrative Year and Utility

5% Reduction in Annual Electricity Use



- Hourly Electric Energy (MWh) - Reference Case
- Capacity Requirement (MW) - Reference Case
- Hourly Electric Energy (MWh) - Annual Reduction Case
- Capacity Requirement (MW) - Annual Reduction Case

Relative Impacts on Annual Bill of Reductions in Electric Capacity and Energy

			Reduction in Peak Demand in 1% of Hours of Year -5%	Reduction in Every Hour of Year -5%
Customer A				
Load factor	%	17%		
Peak	kw	3		
Annual	kwh	4,500		
Bills				
	Monthly	\$/month	47	
	Annual	\$/year	\$ 564	
Reductions				
	Peak demand	kw	-0.15	-0.15
	Annual energy	kwh	-13.5	-225.0
Avoided Costs				
	Capacity (2)	\$/kw - yr	80	
	Energy (2)	\$ per kwh	0.08	
Savings				
	Capacity	\$/year	\$ (12.0)	\$ (12.0)
	Energy	\$/year	\$ (1.1)	\$ (18.0)
	Total	\$/year	\$ (13)	\$ (30)
	Impact		-2.3%	-5.3%
Customer B				
Load factor	%	46%		
Peak	kw	3		
Annual	kwh	12,000		
Bills				
	Monthly	\$/month	108	
	Annual	\$/year	\$ 1,296	
Peak reduction				
	kw		-0.15	-0.15
Annual reduction				
	kwh		-13.5	-600.0
Capacity Cost (w reserve margin)				
	\$/kw - yr	80		
Energy Cost				
	\$ per kwh	0.08		
Capacity Cost				
	\$/year		\$ (12.0)	\$ (12.0)
Energy Cost				
	\$/year		\$ (1.1)	\$ (48.0)
Total				
	\$/year	\$ 1,296	\$ (13)	\$ (60)
	Impact		-1.0%	-4.6%

Usage data for customers from *Typical Bills and Average Rates Report*, Edison Electric Institute, Winter 2006, page 131
Avoided costs of capacity and energy are assumptions for illustrative purposes

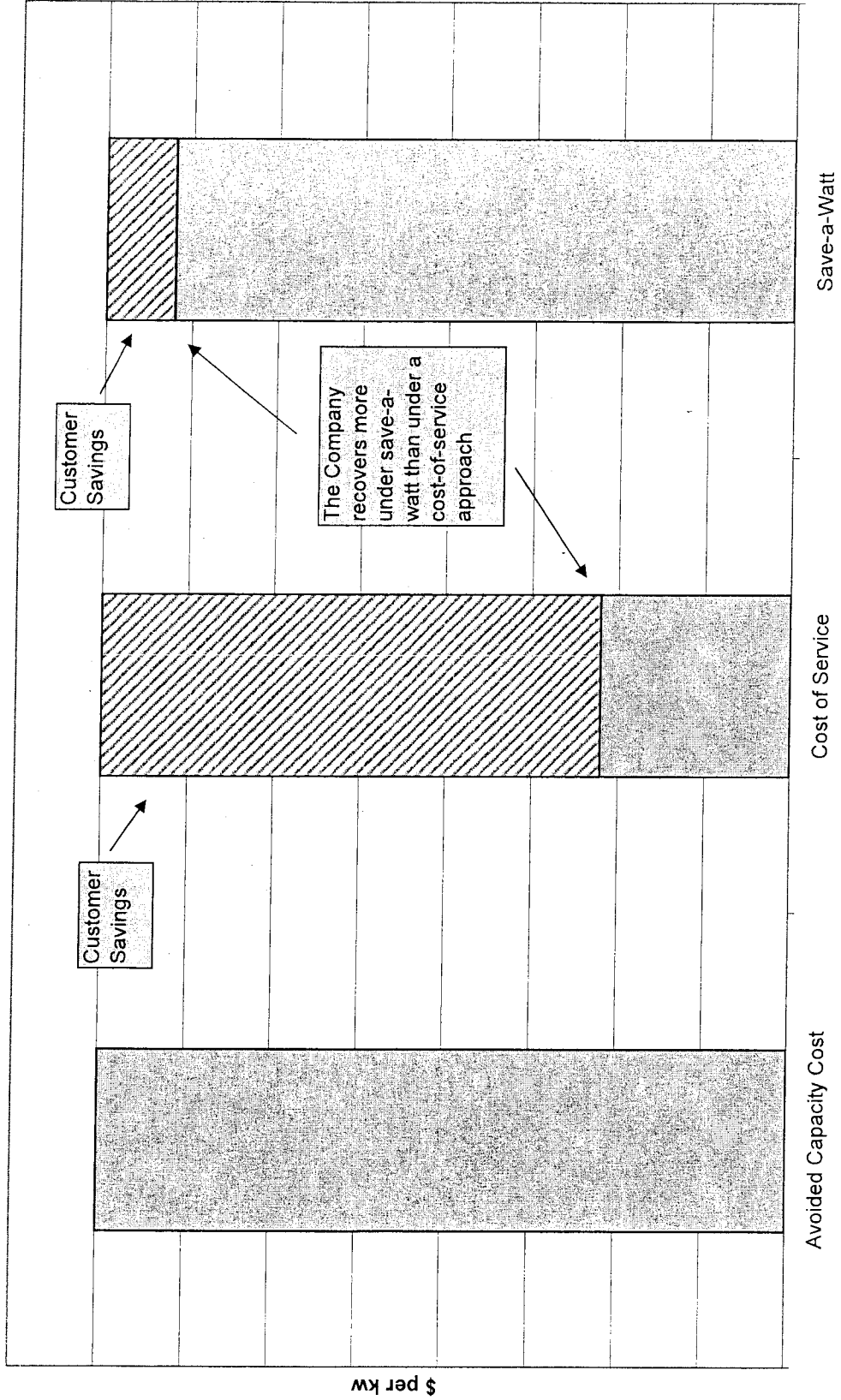
Policy and Rate-making Frameworks For Annual Energy Efficiency Expenditures In Various States

Jurisdiction	Energy Goal?	Description of Goal [10]	Rate-making Framework		
			Direct Program Costs [2]	Treatment of Utility Financial Disincentive to Reductions from Energy Efficiency [2]	Performance Incentive [2]
California	Yes	IOUs to save more than 1% of total forecast electricity sales per year (in 2013, 23,183 GWh and 4,885 MW peak)	Yes	Decoupling	Yes [3]
Massachusetts	Under development (8)	meet 25% of electric load by 2020 with demand side resources	Yes	No [4]	Yes
New York	Yes	15% of total forecasted sales in 2015	Yes	No [5]	No
Washington	Yes	10.6% of projected needs by 2025 offset with improvements in energy efficiency	Yes	No [4]	No
Texas	Yes	20% of load growth through end use energy efficiency	Yes	No	No
Ohio	Yes (9)	In excess of 22% of load by the end of 2025	Yes	No [6]	No (6)
Connecticut	Yes	By 2010, procure 4% of electricity sales from "Class III" resources, such as energy efficiency and combined heat and power	Yes	No [4]	Yes
Vermont	Yes	3.5% of 2006 sales in 2007/2008	Yes	No	Yes
Minnesota	Yes	Minimum of 1% annual energy savings of electric and natural gas sales from energy efficiency	Yes	No [7]	Yes

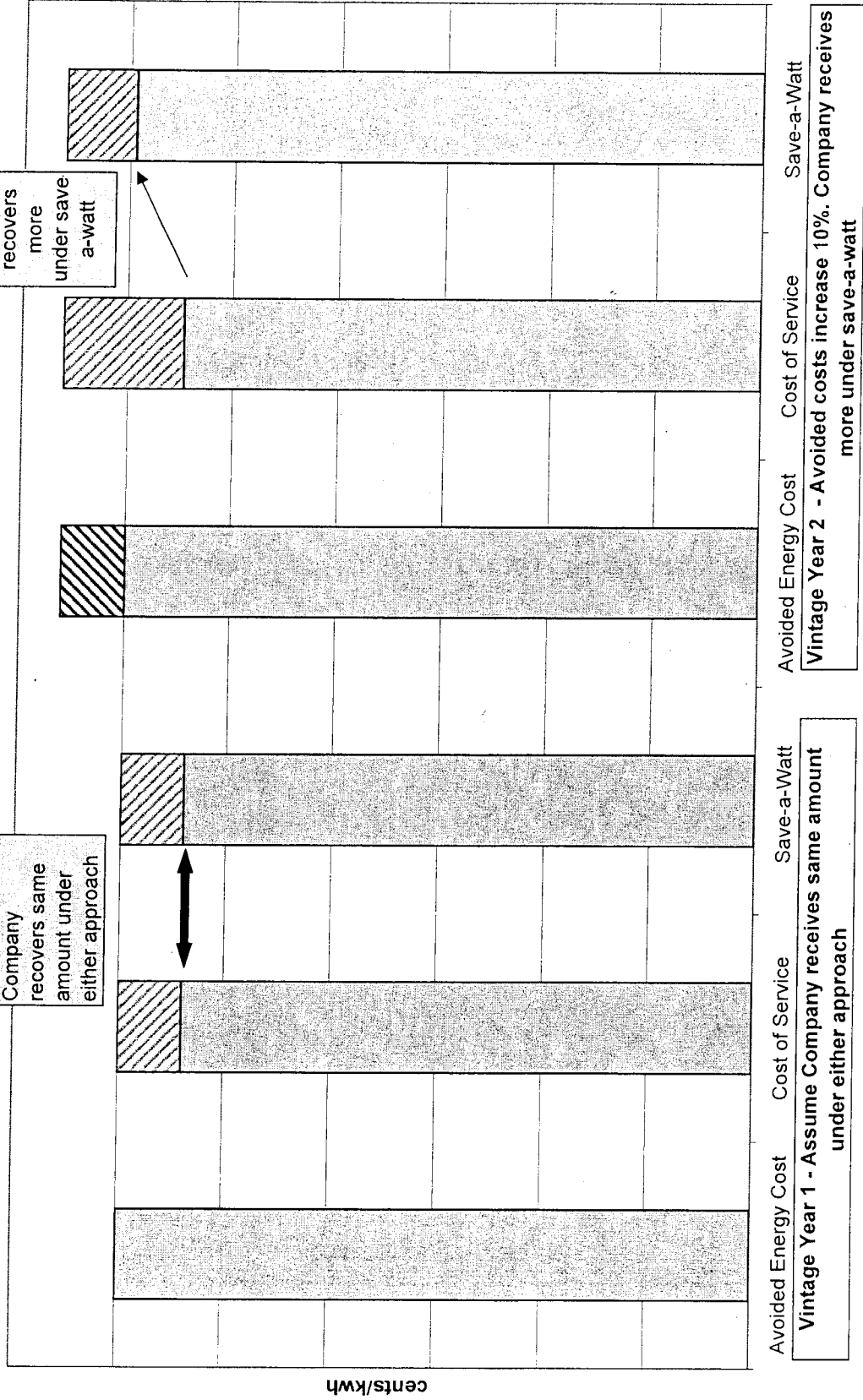
SOURCES

- [1] American Council for an Energy-Efficient Economy, State EERS and RPS and Activity, 2007, <http://www.aceee.org/Energy/state/2pgEERS.pdf>
- [2] Kushler et al. Aligning Utility Interests with Energy Efficiency Objectives: A Review of Recent Efforts at Decoupling and Performance Incentives, October 2006.
- [3] California Public Utilities Commission, Order Instituting Rulemaking to Examine the Commission's post-2005 Energy Efficiency Policies, Programs, Evaluation, Measurement and Verification, and Related Issues. Rulemaking 06-04-010, Filed April 13, 2006
- [4] Massachusetts, Washington, Connecticut are considering decoupling. MA Senate report 2768, June 23, 2008
- [5] New York Public Service Commission recently required electric and gas utilities to develop true-up based revenue decoupling mechanisms in Case 03-E-0640. Issued April 20, 2007.
- [6] Ohio has approved Duke Energy Ohio recovery of lost revenue and share of savings. Ohio is examining decoupling as a general policy.
- [7] Minnesota abandoned its lost revenue adjustment mechanism in favor of performance incentives in 1999. See Kushler et al. (2006) for details.
- [8] Senate Bill No. 2468. Found at: <http://www.mass.gov/legis/bills/senate/185/s102/s102468.htm>
- [9] Senate Bill No. 221. Found at: http://www.legislature.state.oh.us/bills.cfm?ID=127_SB_221
- [10] State EERS and RPS Activity. ACEEE. September 2007. Found at: <http://aceee.org/energy/state/2pgEERS.pdf>

Example 1 - The Company recovers more from reductions in peak demand under save-a-watt than under cost-of-service (\$ per kw)

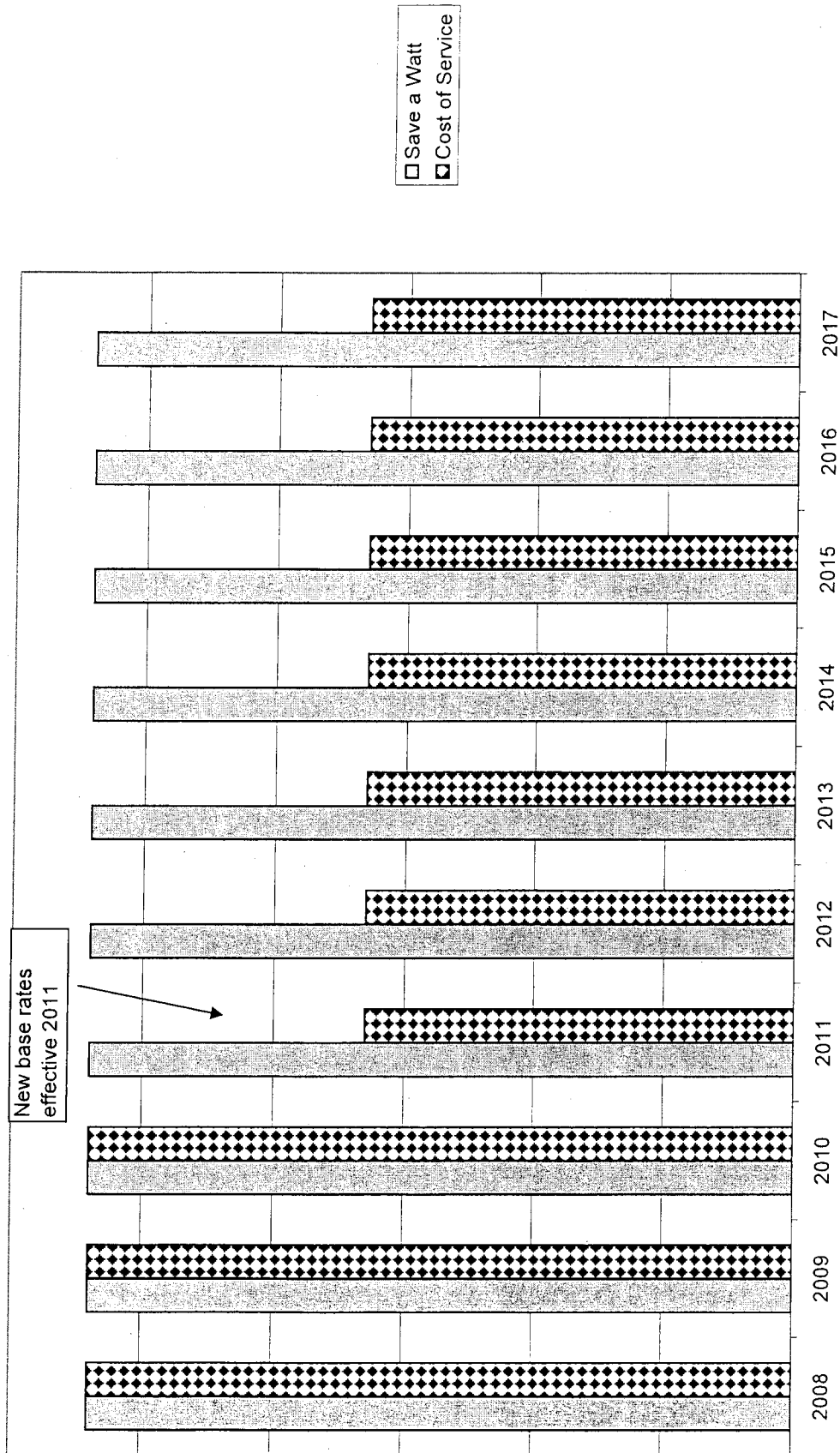


Example 2 - The Company recovers more from an increase in avoided costs under save-a-watt than under a cost-of-service approach

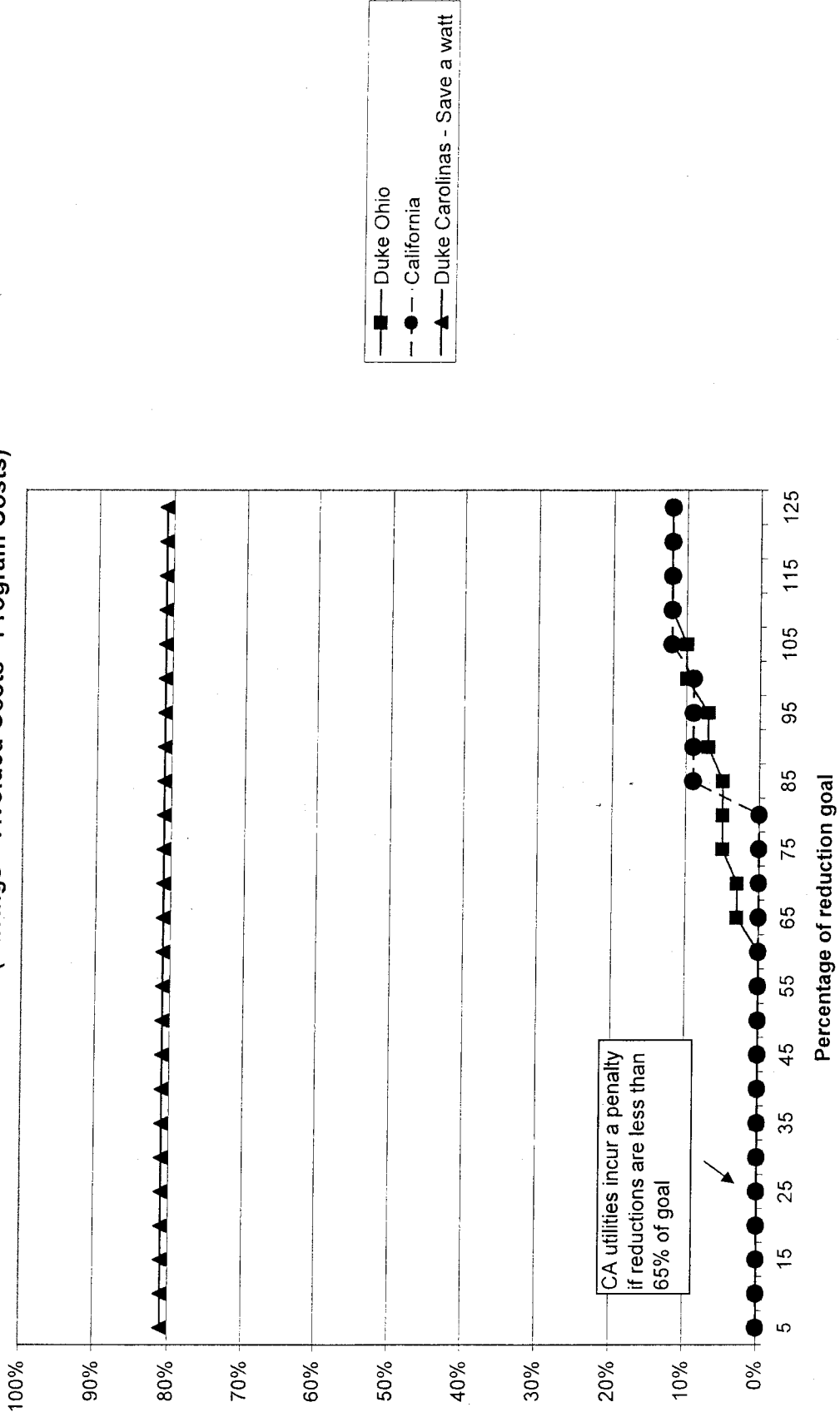


cents/kwh

Example 3 - The Company may recover more after a general rate case under save-a-watt than under a cost-of-service approach (cents/kWh)



Utility share of savings under cost-of-service and save a watt approaches
 (Savings = Avoided Costs - Program Costs)



Reductions in Annual Energy Achieved by Utility Programs in Various States and Proposals by Duke Energy Companies

Jurisdiction	Utility	Formal or Informal Energy Goal	Ratemaking Framework			Most Recent "First Year" Savings as % of Annual Sales in that Year	Sources
			Direct Program Costs	Treatment of Utility Financial Disincentive to Reductions from Energy Efficiency	Performance Incentive		
ACHIEVED							
California	SDG&E	Yes	Yes	Decoupling	Yes	0.9% (2006)	1
California	Southern California Edison	Yes	Yes	Decoupling	Yes	0.8% (2006)	2
California	PG&E	Yes	Yes	Decoupling	Yes	0.9% (2006)	3
Massachusetts	Massachusetts IOUs	Under Development	Yes	No	Yes	1.0% (2006)	4
New York	NYSERDA	Yes	Yes	No	No	0.60% (2006)	5
Washington	Puget Sound Energy Inc	Yes	Yes	No	No	1.37% (2007)	6
Washington	Avista Corp	Yes	Yes	No	No	0.99% (2007)	7
Washington	PacifiCorp	Yes	Yes	No	No	1.28% (2007) *	8
Texas	Texas IOUs	Yes	Yes	No	No	0.90% (2006)	9
Connecticut	Connecticut IOUs	Yes	Yes	No	Yes	1.11% (2006)	11
Vermont	Efficiency Vermont	Yes	Yes	No	Yes	1.80% (2007)	12
Minnesota	Interstate Power & Light	Yes	Yes	No	Yes	1.60% (2006)	13
PROPOSED by Duke Companies							
Ohio	Duke Energy Ohio	Yes	Yes	Yes	Yes	0.4% (2006)	10
Indiana	Duke Energy Indiana		Yes	No	No	0.14% (Year 4) **	14
South Carolina	Duke Energy Carolinas		Yes	No	No	0.21% (Year 4) **	15
North Carolina	Duke Energy Carolinas		Yes	No	No	0.29% (Year 4) **	16

Sources

- General
- 1 Exhibit (JRH-3) & Exhibit (JRH-6)
 - 2 San Diego Gas & Electric 2007. Energy Efficiency Annual Report 2006 Results, Table 1
 - 3 Southern California Edison 2007. 2007 Energy Efficiency Annual Report, Table 1
 - 4 Pacific Gas & Electric 2007. Energy Efficiency Program Portfolio Annual Report For 2006, Table 1
 - 5 Annual savings data from Larry Masland at Massachusetts Division of Energy Resources
 - 6 NYSERDA 2008. 2007 New York Energy \$mart™ Program Evaluation and Status Report, Table 2-14 on page 2-29
 - 7 May 6, 2008 email from Tom Eckman of the Northwest Power and Conservation Council
 - 8 May 6, 2008 email from Tom Eckman of the Northwest Power and Conservation Council
 - 9 Frontier Associates LLC 2007. Energy Efficiency Accomplishments of Texas Investor Owned Utilities Calendar Year 2006, Table 3 on page 7
 - 10 Based on the projected savings in Duke Energy Ohio's Amended Application to Establish Demand-Side Management Programs for Residential and Non-Residential Customers, Case No. 06-91-EL-UNC, 06-92-EL-UNC, 06-93-GA-UNC, filed on 8/15/2006, Appendix A on page 4
 - 11 Connecticut Energy Conservation Management Board 2007. Energy Efficiency Investing in Connecticut's Future: Report of the Energy Conservation Management Board Year 2006 Programs and Operations, Chart B on page 14.
 - 12 Efficiency Vermont 2008. 2007 Preliminary Results and Savings Estimate Report, page 24
 - 13 IPL DSM Filing 2006, Docket No. 05-581.01, Table 1-1 on page 13
 - 14 Calculated using Confidential Attachment CAC 2.1-A - Fall 2007 Annual Forecast.xls and Petitioner's Exhibit M-1-R.xls
 - 15 Calculated using Schedule SELC 10(c).xls and Schedule SELC 1 Financial Comparison Detail.xls
 - 16 Calculated using Schedule SELC 10(c).xls and Schedule SELC 1 Financial Comparison Detail.xls

Notes

- Sales data obtained from EIA 861 database were used to estimate savings as % of sales.
 * Results include Washington and Idaho service territory
 ** For purposes of analysis, year 4 is assumed to be 2011

Responses of Duke Energy Carolinas, Inc. to Selected Coalition Data Requests, Sets 1 and 3

SELC Data Request 3 NonResCons
SELC Data Request 3 NonResDR
SELC Data Request 3 ResCons
SELC Data Request 3 ResDr

The information for Schedule SELC 10(c).xls is found in the file provided in response to SELC Data Request No. 4.

Files for North Carolina do not exist. For residential measures / programs, the North Carolina allocation is 75%; for non-residential measures / programs, the allocation is 69%.

- a. The number of participants is provided on Stevie Confidential Exhibit 4.
- b. Participant costs were not on the Financial Comparison Detail file.

4. **Projected Service Requirements.** For each year for which the Company has projections, please provide the most recent projections of the following parameters:
 - a. Number of customers, by rate class;
 - b. Annual energy usage per customer, by rate class;
 - c. Peak energy use per customer, by rate class.

RESPONSE: The attached file labeled SELC Data Request No. 4 contains the forecast of customers and energy usage by customer class as well as the system peak forecast. Peak energy use per customer is not available.

5. **Projected Capacity and Energy without Save-a-Watt.** For each year for which the Company has projections, please provide the most recent projections of the following parameters with all supporting inputs and calculations:
 - a. Capacity in megawatts ("MW") held or acquired by major source;
 - b. Electric energy in megawatt-hours ("MWh") generated or purchased by major source;
 - c. Peak capacity avoided via load management;
 - d. Peak capacity avoided via energy efficiency;
 - e. Peak capacity avoided via load management and energy conservation;
 - f. Electric energy avoided via energy efficiency.

RESPONSE:

- a. See SELC Data Request 5a Portfolio Summary. The portfolios with Existing EE listed in their name do not include Save-a-Watt.
- b. See Confidential SELC Data Request 5 Prosym Model Inputs and Outputs. The Portfolio Outputs folder contains zip files with model output results. Each portfolio has a set of output reports that contain the name of the portfolio. The files with an extension of ".mn" are the monthly unit results. The files with an extension of ".yr" are the annual unit results. The energy generated or purchased is shown by source in the Station Group Report.
- c. See page 78 of the 2007 Duke Energy Carolinas Annual Plan.

	Avg # of Bills	KWH Sales	Peak Demand
Residential	1,469,449	19,010,153,465	5,315,342
General	514,689	8,337,464,113	2,032,159
Industrial	4,234	2,325,161,751	505,698
Optional Power Service, Time-of-Use	15,342	23,419,091,012	3,947,946
Hourly Pricing	29	411,412,140	20,965
Parallel Generation	2	30,900	-
Multiple Premises	47	199,165,296	-
Nantahala	76,122	1,255,990,456	239,000
Total NC Retail	2,079,913	54,958,469,133	12,061,110

14. Alternative Approaches to Cost Recovery and Financial Incentives.

- a. Please provide all evaluations of utility cost recovery and incentive mechanisms for demand side management that the Company made before selecting Save-a-Watt. If no such evaluations were made, please explain why not.
- b. Please provide all evaluations of the utility cost recovery and incentive mechanisms identified on pages 38 to 45 of the Direct Testimony of Mr. Rose that the Company made before selecting Save-a-Watt. If no such evaluations were made, please explain why not.

RESPONSE:

- a. **Duke Energy Carolinas did not perform such evaluations before selecting save-a-watt. The Company sought a new approach to energy efficiency rather than the traditional cost-plus approach, which rewards the utility based upon results achieved rather than dollars spent.**
- b. See response to 14a.

15. Save-a-Watt Procedure for Regulatory Review of Avoided Costs.

- a. Please list the specific data that the Company proposes to file with the Commission to support its estimate of the initial avoided costs to be recovered through the tariff rider.
- b. Please describe the procedure that the Company proposes the Commission employ to verify the reasonableness of its estimate of initial avoided costs to be recovered through the tariff rider.
- c. Please list the specific data that the Company proposes to file with the Commission to support future updated estimates of avoided costs to be recovered through the tariff rider.
- d. Please describe the procedure that the Company proposes the Commission employ to verify the reasonableness of future changes in its updated estimates of avoided costs to be recovered through the tariff rider.

RESPONSE:

- a. **Please see the testimony and exhibits of Stephen M. Farmer and Richard G. Stevie in this proceeding. The avoided capacity cost rates will be those rates approved by the Commission in its biennial avoided cost proceeding.**
- b. **The Company proposes that the Commission use its usual review procedure in the biennial avoided cost proceedings to determine the reasonableness of the Company's avoided cost rates.**

a. Both portfolios used to calculate the avoided energy costs include one 1100 MW nuclear unit.

b-e. Not applicable.

21. Estimate of Avoided Energy Costs (Direct Testimony of Dr. Stevie page 14 lines 11 to 16).

- a. Does the Company's estimate of avoided costs to be used in Save-a-Watt, as presented in this filing, reflect the Company's expectations regarding the future prices of carbon? If not, please explain why not.
- b. If regulations are enacted in the future that limit the quantity of carbon dioxide emissions from electricity generation, and the costs of compliance resulting from those regulations prove to be equal to the Company's carbon price forecast, would the Company's avoided costs used in Save-a-Watt increase to reflect those costs of compliance with carbon regulations? If not, please explain why not.

RESPONSE:

- a. **No. The Company did not reflect the Company's expectations of carbon prices because there is no current law requiring greenhouse gas regulation.**
- b. **Yes.**

22. **Save-a-Watt Commitments.** A February 4, 2008 Joint Statement issued by the Alliance to Save Energy, American Council for an Energy-Efficient Economy, and the Energy Future Coalition lists five "commitments" made by Duke Energy. One stated commitment is to achieve electricity savings equal to at least 1% of its 2009 retail electricity sales by 2015, and an additional 1% per year thereafter, with savings each year over the 2009-2014 period ramping up to this 1% per year target. Please provide the following information regarding the Company's plan to honor those commitments in North Carolina:

- a. The financial penalty that the Company will incur if it fails to meet this commitment.
- b. How does the Company plan to restructure its demand response and energy efficiency programs to get to this level?
- c. Please state whether any energy reductions achieved through activities that are outside of the specific programs that the Company is funding (i.e., from improved building codes, for example) will be counted towards these goals.
 - i. If so, please identify each of the additional activities that could result in energy reductions and be counted towards these goals.
 - ii. Please describe each of these activities and include details on how they will be funded and administered.
- d. Please state whether any anticipated spillover of benefits from activities that are outside of the specific programs that the Company is funding (i.e., from greater market penetration of higher efficiency appliances with higher standards, for example) will be counted towards these goals.
 - i. If so, please identify each of the additional activities that could result in energy reductions and be counted towards these goals.
 - ii. Please describe each of these activities and include details on how they will be funded and administered.

calculations of the cost-effectiveness of each program under the Total Resource Cost Test and the Utility Cost Test if earnings from efficiency under Save-a-Watt are included as program costs. Please provide all inputs and calculations.

RESPONSE: See the following table:

Revenue Based Program Cost Effectiveness Test Results				
	Utility Test	TRC Test	RIM Test	Participant Test
RESIDENTIAL CUSTOMER PROGRAMS				
Residential Energy Assessments	1.32	1.32	0.58	NA
Residential Smart Saver [®] Energy Efficiency	1.32	1.14	0.58	6.32
Low Income Services Agency Kits	1.31	1.31	0.56	NA
Low Income Weatherization	1.34	1.34	0.64	NA
Energy Efficiency Education Program for Schools	1.30	1.30	0.60	NA
Power Manager	2.74	3.09	2.74	NA
NON-RESIDENTIAL CUSTOMER PROGRAMS				
Non-Residential Energy Assessments	NA	NA	NA	NA
Smart Saver [®] for Non-Residential Customers	1.36	1.05	0.78	2.41
Power Share [®]	2.66	3.24	2.66	NA

47. In the Company's filing, program costs are estimated for Save-a-Watt for four years into the future.
- Please state whether the Company has estimated the direct capital and labor costs of energy efficiency and/or demand response measures beyond that timeframe.
 - If so, please provide these estimates by year, in total and by program.
 - If not, please explain why not.

RESPONSE:

- The Company has not estimated these costs for conservation programs.
- See Stevie Confidential Exhibit No. 4 for the demand response projected costs.
- The planning horizon for save-a-watt program impacts is four years. The Company cannot accurately predict beyond this time horizon with reasonable certainty future impacts and their associated customer adoption rates, incentive levels, free-ridership rates, program costs, and other potential benefits. The market for energy efficiency changes frequently and is difficult to estimate with certainty beyond a limited time horizon. The Company has made its best efforts to estimate with reasonable certainty out to four years. Additionally, the Company expects to annually update future impacts from save-a-watt each year out to the four year planning horizon.

48. Page 6, lines 15-21 of Richard Stevie's testimony states, "Duke Energy Carolinas developed its portfolio of programs in collaboration with interested stakeholders over the past year and a half. The energy efficiency programs and measures considered by the Company and the Collaborative included: (i) programs already offered and tested by Duke Energy Carolinas' affiliate utility operating companies, (ii) new programs suggested by the Collaborative, and

- d. What the utility's effective return on equity is expected to be (a) with and (b) without the four-year Save-a-Watt plan.

RESPONSE:

- a. See response to SELC Data Request No. 8h. This exhibit shows the pro forma net income the company estimates it would receive from the four-year save-a-watt plan.
- b. See response to SELC Data Request No. 8 items f and g. This exhibit shows the program costs and lost margins associated with the four-year save-a-watt plan.
- c. See Confidential SELC Data Response 54c, at row 51. This exhibit shows the estimated level of earnings (expressed as the dollar return on equity) associated with building a similarly-sized combustion turbine using the latest filed avoided capacity costs.
- d. See Confidential SELC Data Response 54d, at rows 18 and 19. This exhibit shows the estimated return on equity with and without save-a-watt.

55. Please provide a table showing the following side-by-side:

- a. TRC benefit cost ratios by program;
- b. TRC benefit cost ratios by program using 90% of the avoided costs (revenues) in place of program costs;
- c. UCT benefit cost ratio by program;
- d. UCT benefit cost ratios by program using 90% of the avoided costs (revenues) in place of program costs.

RESPONSE:

- a. See Stevie Exhibit No. 3
- b. See response to SELC Data Request No. 46.
- c. See response to SELC Data Request No. 55a.
- d. See response to SELC Data Request No. 55b.

56. **Vintage-Specific Data.** Please provide the following by program, in total for all energy conservation programs, in total for all demand response programs, and in total across all programs:

- a. Revenues for each year for each vintage;
- b. Program Costs for each year for each vintage;
- c. Lost Margins for each year for each vintage;
- d. Shared Savings for each year for each vintage;
- e. Avoided Costs for each year for each vintage;
- f. kWh savings for each year for each vintage;
- g. kW savings for each year for each vintage.

RESPONSE: Duke Energy Carolinas objects to this request on the grounds that it requests an analysis to be performed that the Company has not already performed.

57. Company Proposed Programs versus Market Potential Study Recommendations (Testimony of Mr. Schultz).

- a. Please compare the Company's proposed programs to those recommended in the Market Potential Study.
- b. Please explain which, if any, programs that were recommended in the potential study were not included in the Company's proposed plan.
- c. If there were programs that were recommended in the potential study, but not included in the Company's proposed plan, please explain why each of these programs was not included.
- d. Please quantify the absolute and percent differences between the recommended program costs and associated kW and kWh savings in the potential study and the proposed program costs and associated kW and kWh savings in the Company's plan:
 - i. At the program level;
 - ii. Across all energy conservation programs;
 - iii. Across all demand response programs;
 - iv. Across all programs.

RESPONSE:

- a. See the testimony of Dr. Richard G. Stevie, pages 7 to 10.
- b. See response to SELC Data Request No. 57a.
- c. See response to SELC Data Request No. 57a.
- d. **Duke Energy Carolinas objects to this request on the grounds that it requests an analysis to be performed that the Company has not already performed. Notwithstanding and without waiving this objection, the only information from the market potential study that has been compiled at the program level is provided on the file labeled SELC Data Response No 57d. Aggregate information on energy is compared on page 10 of the testimony of Dr. Richard G. Stevie. The other information requested has not been compiled.**

58. Testimony of Mr. Rogers. Page 5, lines 3-4:

- a. Please describe each quantitative metric that the Company proposes to use to measure the energy-efficiency of or in its service territory. If the Company is not proposing to use any such metric, please explain why not.
- b. Please explain the basis for choosing each quantitative metric.
- c. Please describe the benchmarks against which the Company proposes to measure the level of energy-efficiency in its service territory, and the rationale for choosing those benchmarks. If the Company is not proposing to use any such benchmarks, please explain why not.
- d. Please provide the forecast value of each metric if Save-a-Watt is not implemented. If the Company did not make this calculation, please explain why not.
- e. Please provide the forecast value of each metric if Save-a-Watt is implemented. If the Company did not make this calculation, please explain why not.

RESPONSE: a-e. The statement referred to in this data request involved setting a goal to be the most energy efficient economy in the world. This goal is an aspiration. There are no metrics at this time.

59. Testimony of Mr. Rogers. Page 5, lines 4-5, regarding "de-carbonize:"

- a. Please describe each quantitative metric that the Company proposes to use to measure the carbon intensity of or in its service territory. If the Company is not proposing to use any such metric, please explain why not.
- b. Please explain the basis for choosing each quantitative metric.
- c. Please describe the benchmarks against which the Company proposes to measure the level of carbon intensity in its service territory, and the rationale for choosing those benchmarks. If the Company is not proposing to use any such benchmarks, please explain why not.
- d. Please provide the forecast value of each metric if Save-a-Watt is not implemented. If the Company did not make this calculation, please explain why not.
- e. Please provide the forecast value of each metric if Save-a-Watt is implemented. If the Company did not make this calculation, please explain why not.

RESPONSE: a-e. This objective is an aspiration. No metrics have been set at this time.

60. Testimony of Mr. Rogers. Page 5, lines 4-5, regarding "de-carbonize," Testimony of Ms. Hager and Duke Energy Carolinas 2007 Annual Plan:

- a. Please provide the forecast quantity of annual carbon dioxide emissions in each year of the Annual Plan if Save-a-Watt is not implemented. If the Company did not make this calculation, please explain why not.
- b. Please provide the forecast quantity of annual carbon dioxide emissions in each year of the Annual Plan if Save-a-Watt is implemented. If the Company did not make this calculation, please explain why not.

RESPONSE:

- a. **See SELC Data Response No 60 Portfolio Emissions for the emissions from four different portfolios. The emissions were not compiled for each portfolio and sensitivity of the 2007 Duke Energy Carolinas Annual Plan. The emission quantities and costs are included in the Confidential Prosym model runs provided in response to SELC Data Request No. 5.**
- b. **See response to part a of this question.**

61. Testimony of Mr. Rogers. Page 12, line 11 to page 14 line 5, regarding "Save-a-Watt:"

- a. Please provide all analyses prepared by, or for, the Company of utilities who in the past were, or who currently are, compensated for their energy efficiency programs at a percentage of their avoided costs, i.e., similar to Save-a-Watt.
- b. If the Company did no research on the history of the application of this approach to utility energy efficiency programs, please explain why not.

RESPONSE:

- a. **The Company is not currently aware of any other company being compensated for their energy efficiency programs solely based on a percentage of avoided costs.**

- b. **The Company did do research and did not find an active application of its save-a-watt approach to its energy efficiency programs by any other utility.**

62. Testimony of Mr. Rogers. Page 12, line 11 to page 14 line 5, regarding “Save-a-Watt” and testimony of Mr. Schultz.

- a. Please provide a copy of the Order approving the method(s) and/or mechanism(s) through which Duke Energy Ohio is compensated for its energy efficiency programs.
- b. Please provide the most recent annual report describing the energy efficiency programs of Duke Energy Ohio, including annual budgets and annual capacity and energy savings by program.
- c. Please provide all reasons why Duke Energy Carolinas decided not to propose an energy efficiency program compensation approach similar to that under which Duke Energy Ohio is operating. Please include all the analyses prepared by, or for, Duke Energy Carolinas upon which its decision was based.

RESPONSE: a-c. Duke Energy Carolinas objects to this request on the grounds that it requests information not relevant to this proceeding.

63. Testimony of Mr. Rogers. Page 12, line 15 to page 13 line 9, regarding “Save-a-Watt” and Testimonies of Ms. Sadowsky and Mr. Wiles. According to its 2007 Annual Plan, the Company has received proposals for almost 2000 MW of renewable energy. If any of those proposals, or future proposals, provide the Company an opportunity to acquire energy and capacity at prices materially less than its avoided costs of traditional supply, will it request approval to be compensated for those renewable supplies at 90% of its avoided costs? If not, please explain why not.

RESPONSE: Duke Energy Carolinas objects to this request on the grounds that it calls for the Company to speculate about future renewable energy costs.

64. Testimony of Mr. Rogers. Page 12, line 15 to page 13 line 9, regarding “Save-a-Watt” and Testimonies of Ms. Sadowsky and Mr. Dwight:

- a. Please identify each power purchase agreement (PPA) that the Company entered over the past five years, excluding all PPAs made under the QF Tariff.
- b. Please provide the Commission Order(s) approving each of those PPAs.
- c. Please explain why the Company is considering purchasing electricity from conventional or renewable energy sources, as noted in its 2007 Annual Plan, if it would not earn a return on those purchases.

RESPONSE: Duke Energy Carolinas objects to this request on the grounds that it is overly broad, unduly burdensome, and requests information that is not relevant to this proceeding.

65. Testimony of Ms. Ruff. Page 10, line 6, regarding reduced cost. For a given quantity of capacity and energy savings, where physical and cost savings are measured relative to a reference case in which Save-a-Watt is not approved, please provide all analyses prepared by, or for, the Company of the reduction of costs to customers:

- a. Under Save-a-Watt. If no such analysis was prepared, please explain why not;
- b. Under a cost of service based compensation mechanism such as those identified on pages 38 to 45 of the Testimony of Mr. Rose. If no such analysis was prepared, please explain why not.

RESPONSE:

- a. See response to SELC Data Request No 5.
- b. **Neither Mr. Rose nor the Company have performed such analysis. The focus has been on the charges to consumers under the proposed recovery mechanism, not a cost-of-service based evaluation.**

66. Testimony of Ms. Ruff. Page 10, line 6, regarding reduced environmental impact:

- a. Please provide all analyses prepared by, or for, the Company of the reduction in environmental impacts attributable to the reductions in peak demand expected under Save-a-Watt. If no such analysis was prepared, please explain why not.
- b. Please provide all analyses prepared by, or for, the Company of the reduction in environmental impacts attributable to the reductions in annual energy expected under Save-a-Watt. If no such analysis was prepared, please explain why not.

RESPONSE:

- a. **The Company does not have results that separate out the impact of demand response and energy efficiency programs. See response to SELC Data Request No. 60 for the emissions from four different portfolios. The emissions were not compiled for each portfolio and sensitivity of the 2007 Duke Energy Carolinas Annual Plan. The emission quantities and costs are included in the Confidential Prosym model runs provided in response to SELC Data Request No. 5.**
- b. See response to part a of this question.

67. Testimony of Ms. Ruff. Page 10, lines 14 to 16, regarding significant energy efficiency contributions:

- a. What magnitude of cumulative reductions would be required from Save-a-Watt, and by what date, in order to delay the 800 MW Cliffside 6 unit identified in the Duke Energy Carolinas Annual Plan of November 15, 2007? Please provide all supporting analyses.
- b. What magnitude of cumulative reductions would be required from Save-a-Watt, and by what date, in order to avoid the 800 MW Cliffside 6 unit. Please provide all supporting analyses.
- c. What magnitude of cumulative reductions would be required from Save-a-Watt, and by what date, in order to delay some or all of the new combined-cycle/peaking capacity identified in the Duke Energy Carolinas Annual Plan of November 15, 2007? Please provide all supporting analyses.
- d. What magnitude of cumulative reductions would be required from Save-a-Watt, and by what date, in order to avoid some or all of the new combined-cycle/peaking capacity? Please provide all supporting analyses.

- e. What magnitude of cumulative reductions would be required from Save-a-Watt, and by what date, in order to delay the 2,234 MW of new nuclear capacity identified in the Duke Energy Carolinas Annual Plan of November 15, 2007. Please provide all supporting analyses.
- f. What magnitude of cumulative reductions would be required from Save-a-Watt, and by what date, in order to avoid the 2,234 MW of new nuclear capacity? Please provide all supporting analyses.

RESPONSE:

a-f. Duke Energy Carolinas objects to this request on the grounds that it requests an analysis to be performed that the Company has not already performed.

68. Testimony of Ms. Ruff, page 13, lines 13 to 17, regarding rate impacts:

- a. Please provide the forecast of rates, by major customer class or segment, each year if Duke Energy Carolinas were required to build and dispatch new capacity to meet the load it expects to avoid through its energy efficiency programs. Please provide all supporting analyses.
- b. Please provide the forecast of rates, by major customer class or segment, each year under Save-a-Watt. Please provide all supporting analyses.
- c. Please provide the forecast reduction in bills of customers who participate in Save-a-Watt. Please provide all supporting analyses.

RESPONSE:

- a. **Duke Energy Carolinas objects to this request on the grounds that it requests an analysis to be performed that the Company has not already performed.**
- b. **Duke Energy Carolinas objects to this request on the grounds that it requests an analysis to be performed that the Company has not already performed. Notwithstanding and without waiving this objection, this analysis has not been performed by customer class; however, Farmer Exhibit No. 3 provides expected rate impacts.**
- c. **We have performed such analyses for major customers upon request; however, the results of such analyses are the confidential and proprietary information of the customer. Suffice it to say, participation led to lower bills.**

69. Testimony of Ms. Ruff, page 12, lines 12 to 14, regarding energy efficiency at a lower cost. Please provide all analyses prepared by, or for, the Company comparing the costs that customers will pay for energy efficiency under the energy efficiency Rider to the costs that customers would pay for the exact same mix and level of energy efficiency under a cost-of-service-based compensation mechanism that allows recovery of direct program costs, net lost margin and a financial incentive based upon performance. If no such analysis was prepared, please explain why not.

RESPONSE: Duke Energy Carolinas objects to this request on the grounds that it requests an analysis to be performed that the Company has not already performed.

70. Testimony of Mr. Rose, pages 20 to 45:

- a. Please provide all analyses prepared by Mr. Rose of utilities that in the past were, or that currently are, compensated for their energy efficiency programs at a percentage of their avoided costs.
- b. Was Mr. Rose involved in the design and development of Save-a-Watt? If so, please describe the role that he played.
- c. Rose Table 2 on page 33 provides statistics on efficiency savings achieved in other states as of 2004. Has Mr. Rose prepared or examined any other metrics of control of energy use by state, such as annual energy per capita over time? If so, please provide that material. If not, please explain why not.
- d. Table 2 on page 33 provides statistics on efficiency savings achieved in other states as of 2004. Please update this table using the most recent data publicly available.
- e. Please provide all analyses prepared by Mr. Rose of the additional savings that each of the states identified in Table 2 is expected to achieve by 2015 based upon its currently effective programs. If Mr. Rose has not prepared such an analysis, please explain why not.
- f. Table 2 on page 33 provides statistics on efficiency savings achieved in other states as of 2004. Please update this table using the most recent data publicly available.
- g. Please provide all analyses prepared by Mr. Rose of the ability of Save-a-Watt to achieve savings greater than those in Table 2 by 2015.
- h. Please explain why Mr. Rose provided descriptions of the compensation arrangements for energy efficiency described on pages 38 to 45.
- i. Please identify every docket in which Mr. Rose has testified in support of any or all of the compensation arrangements for energy efficiency described on pages 38 to 45.
- j. Please identify every docket in which Mr. Rose has testified in opposition to any or all of the compensation arrangements for energy efficiency described on pages 38 to 45.

RESPONSE:

- a. **Mr. Rose did not perform such analysis.**
- b. **No. Mr. Rose was not involved in the design and development of save-a-watt. Mr. Rose supports the overall concept of the plan.**
- c. **Mr. Rose examined other metrics of control of energy by state. Please see SELC Data Response No 70c EIA AEO 2007, SELC Data Response No 70c EIA AEO 2006, SELC Data Response 70c Plenary Rosenfield, SELC Data Response 70c Trends Sept 2000, SELC Data Response 70c 2008 Early Release, and SELC Data Response 70c Energy Intensity 1985 to 1991.**
- d. **No update information is available at this time.**
- e. **Mr. Rose has not prepared such analysis because he was most interested in what had actually been achieved as opposed to plans which might not be achieved.**
- f. **See response to 70d.**
- g. **See response to 70f.**
- h. **Mr. Rose wanted to provide information on alternative and representative incentive approaches to highlight the importance of incentives, as well as the variety.**
- i. **Mr. Rose has not testified in support of any or all of the compensation arrangements for energy efficiency in other dockets.**
- j. **Mr. Rose has not testified in opposition to any or all of the compensation arrangements for energy efficiency in other dockets.**

71. Testimony of Mr. Rose, page 45 line 7:

- a. Please explain what Mr. Rose means by “streamlined” and provide all analyses prepared to support this characterization.
- b. Please identify every docket in which Mr. Rose has testified for a client other than Duke Energy Carolinas, or one of its affiliates, proposing or supporting a compensation arrangement for energy efficiency programs that is similar to Save-a-Watt.

RESPONSE:

- a. **Streamlined refers to the relative simplicity of the approach. The payment is a percentage of avoided costs, and once avoided costs are established, the analysis of any program can be conducted. This also refers to commonality in application in that the approach to any program is similar and differs only with respect to the avoided cost and implementation cost impacts.**
- b. See response to 70i.

72. Testimony of Mr. Rose, page 45 lines 8 to 10:

- a. Please explain what is meant by this sentence.
- b. Is it the position of Mr. Rose that Save-a-Watt will achieve capacity and energy savings closer to the estimated potential than would any of the compensation arrangements for energy efficiency described on pages 38 to 45 of his testimony? If so, please provide the analyses he relied upon to form his position.

RESPONSE:

- a. **There is more than one sentence here. They both seem straightforward. Please specify SELC’s confusion.**
- b. **Mr. Rose does not believe a definitive conclusion is possible, but believes that because the program provides more incentives than the other programs, it has the potential to provide the most savings. The analysis relied upon the estimates of potential savings, the failure across states an time to achieve these savings, and the amount of incentives potentially available.**

73. Testimony of Mr. Rose, page 45 lines 11 to 13.

- a. Please provide all analyses prepared by Mr. Rose which show that the actual, verified savings from the measures implemented under Save-a-Watt will be materially less than the Company’s estimates.
- b. Please provide all analyses prepared by Mr. Rose which show that the actual direct program costs of the measures implemented under Save-a-Watt will be materially greater than the Company’s estimates.

RESPONSE:

- a. **Mr. Rose has not prepared such analysis.**
- b. **Mr. Rose has not prepared such analysis.**

74. Testimony of Dr. Cicchetti, page 4 lines 7 to 22:

- a. Please provide all analyses prepared by Dr. Cicchetti of utilities that in the past were, or that currently are, compensated for their energy efficiency programs at a percentage of their avoided costs, i.e., similar to Save-a-Watt.
- b. Was Dr. Cicchetti involved in the design and development of Save-a-Watt? If so, please describe the role that he played.
- c. Please provide all analyses prepared by Dr. Cicchetti of the incremental reductions in energy use that California, New York, Massachusetts, New Jersey, Texas or Washington is expected to achieve by 2015 based upon their currently effective programs. If Dr. Cicchetti has not prepared such an analysis, please explain the basis for his position that the Save-a-Watt approach will achieve greater savings than the programs in those states.
- d. Please identify every docket in which Dr. Cicchetti has testified in support of any or all of the compensation arrangements for energy efficiency in California, New York, Massachusetts, New Jersey, Texas or Washington in the past five years.
- e. Please identify every docket in which Dr. Cicchetti has testified in opposition to any or all of the compensation arrangements for energy efficiency in California, New York, Massachusetts, New Jersey, Texas or Washington in the past five years.
- f. Please identify every docket in which Dr. Cicchetti has testified for a client other than Duke Energy Carolinas, or one of its affiliates, proposing or supporting a compensation arrangement for energy efficiency programs that is similar to Save-a-Watt.

RESPONSE:

a. The Save-a-Watt plan is an innovative approach; and as such, there are no “similar” precedents, if the word “similar” means nearly identical. That said, in his research, Dr. Cicchetti has observed two very important things. First, particularly in the early 1990s, there were many instances where states either directly awarded financial incentives, approved rather generous indirect cost allocations to demand-side management (energy efficiency and load management), and/or provided adjustments to ensure a reasonable degree of revenue or earnings neutrality (sometimes called decoupling). Second, over the past fifteen years, there were and are very strong positive statistical relationships between the extent and degree of regulatory incentives for demand-side management and several important metrics. These metrics include: (1) the percent of “incremental” MWH and MW savings relative to annual retail sales; (2) the cumulative “annual” savings measured in MWHs and MWs relative to annual retail sales; and (3) various other metrics used to measure the amount spent and savings achieved.

Accordingly, while no direct similarities exist, Dr. Cicchetti’s answer becomes a strong “yes” when the word “similar” means “Should Duke Energy Carolinas profit from a successful energy efficiency program?” Dr. Cicchetti believes this is the key issue because save-a-watt’s fundamental premise is to turn energy efficiency and load management into new regulatory service lines, or a fifth fuel, and to have an opportunity, not a guarantee, to earn a profit if the Company succeeds.

The primary difference with save-a-watt and other incentive approaches is the means used to incentivize and measure success. Other approaches add dollars to the direct cost of energy efficiency and/or make adjustments to regulated prices for decoupling. Here, the Company proposes to use the successful concept of avoided cost to establish an earnings base for energy efficiency. Recall that under the PURPA, the avoided cost concept for utilities has been used to encourage cogeneration and renewable energy. This concept

ensures that consumers' revenue requirement would be less than traditional build, own, and operate generation, and establishes prices that encourage the development of new services, products, and other competitive benefits.

In Dr. Cicchetti's opinion, save-a-watt is a major and very beneficial refinement of what has been done in the past and elsewhere. It is, as Dr. Cicchetti explains in his testimony, worthy of becoming a national model of how to design and, most important, sustain a utility program to deliver energy efficiency and load management to the nation.

Finally, see SELC Data Responses Nos 74 through 79 Appendices A to F, which contains two working papers (Appendix A and Appendix B) that explain some of Dr. Cicchetti's more important statistical analyses of how financial incentives help electric utilities improve their energy efficiency successes.

b. Dr. Cicchetti did not participate in designing save-a-watt. However, when he began to review current energy efficiency efforts around the nation, he discovered the Company's save-a-watt plan. He prepared an independent evaluation, which he shared in draft form at the 2007 Summer Program of the Aspen Institute. A version of this paper was subsequently published in Public Utilities Fortnightly. In this analysis, Dr. Cicchetti explained why he concluded that save-a-watt is innovative, fills some significant voids found in other efforts, has net benefits for all customers, and is likely to succeed and be sustained. None of this work was financed by the Company or its affiliates. Dr. Cicchetti relied on publicly available information.

c. Dr. Cicchetti did not estimate what these other six states would achieve in 2015. Instead, he has compared the Company's proposed levels of energy efficiency and load management to other large investor-owned utilities' (IOUs) most recent and past levels of energy efficiency and load management savings.

Dr. Cicchetti has prepared four analyses, which are attached as Appendix A in the file labeled SELC Data Responses Nos 74 through 79 Appendices A to F. These show that the Company would jump to 2nd (at 4.44%) and 4th place (at 1.86%) nationally (using the Top 100 IOUs for comparison) in terms of incremental annual reductions in capacity through load management in 2008 and 2011, respectively. On a cumulative capacity savings basis, the Company would achieve 24th place (at 4.44%) in 2008 and 16th place (at 7.78%) in 2011.

Dr. Cicchetti similarly found, conservatively assuming no pre-existing MWH savings, that Company would be at 22nd place (at .23%) in 2008, and 21st place (at .24%) in 2011 in terms of incremental annual savings. On a cumulative basis, assuming no pre-existing MWH savings had been achieved, the Company would be at 44th place (at .23%) and increase to 37th place (at .94%) in 2011.

Dr. Cicchetti interprets the Company's proposals to be its targets to close the current gap. However, with reasonable financial incentives and customer cooperation, the Company could reasonably beat these proposed targets. Furthermore, the Company proposes a very vigorous independent monitoring and verification program to ensure customers only pay for actual verified results. He also recognizes that the "leaders" in energy efficiency may not simply stand still. Therefore, the Company may need to do more. Save-a-watt has incentives and the means to do so.

d. Dr. Cicchetti has not filed any such testimony in these six states over the past five years.

e. Dr. Cicchetti has never filed testimony opposing compensation related to energy efficiency. (See SELC Data Responses Nos 74 through 79 Appendices A to F, at Appendix D for a review of Dr. Cicchetti's support for energy efficiency).

f. Dr. Cicchetti has written testimony in support of a program to expand renewables for ATCO, an Alberta utility. This plan has direct financial incentives and focuses primarily on renewable energy. As Dr. Cicchetti explained in the response to 74a above, this may or may not be what the questions means by the word "similar." In the narrowest context, the answer would be none.

75. Testimony of Dr. Cicchetti, page 5 lines 9 to 13:

- a. Did Dr. Cicchetti assess the Duke Energy Carolinas Energy Efficiency Plan relative to any or all of the compensation arrangements for energy efficiency currently in effect in California, New York, Massachusetts, New Jersey, Texas or Washington? If yes, please provide those analyses. If not, please explain why not.
- b. Does Dr. Cicchetti agree with the statement by Mr. Rose in his Direct Testimony on page 45, lines 14 to 15? If not, please explain why not.

RESPONSE:

a. Not directly. That said, Dr. Cicchetti has performed several different statistical experiments (see analyses attached as Appendix B in SELC Data Responses Nos 74 through 79 Appendices A to F). These six states, as well as all other states, are included in this analysis, which also covers fifteen years of data. These analyses show that financial incentives work in both directions (*i.e.*, more "success" when incentives are used and less when they are not used).

Dr. Cicchetti did not believe it was necessary to study the unique specific details of any particular state in isolation. Instead, he examined national data over fifteen years and included variables for each state that reflected binary questions (*e.g.*, incentives or not for each year) and the existence of financial mark-ups or margins of the amount customers paid relative to direct energy efficiency and load management program costs.

b. Yes, although Dr. Cicchetti and Mr. Rose undoubtedly have different experiences and have not performed identical empirical research.

Dr. Cicchetti does not believe save-a-watt is the only approach regulators might consider or adopt. That said, while he has an open mind as a scientist and former regulator for such matters, he concludes that save-a-watt has been designed to establish a new regulatory paradigm, create a strong and viable utility business focus, and is very likely to succeed and to sustain efforts to increase energy efficiency. Dr. Cicchetti believes that words like "good," "outstanding," "better," or "top tier" are more appropriate ways to describe his views concerning save-a-watt than the word "best." When he uses that term, Dr. Cicchetti generally is comparing "best" prices to "least cost prices."

76. Testimony of Dr. Cicchetti, page 7 lines 3 to 8:

- a. Is it your position that electricity supply is not a "value" service. If so, please explain why?
- b. Please provide all research conducted by or for Dr. Cicchetti that supports the statement on lines 7 and 8.

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 831

In the Matter of:)	
)	
Application of Duke Energy	)	DUKE ENERGY CAROLINAS'
Carolinas, LLC for Approval of Save-	)	RESPONSES TO ENVIRONMENTAL
a-Watt Approach, Energy Efficiency	)	DEFENSE FUND, SOUTHERN
Rider and Portfolio of Energy	)	ALLIANCE FOR CLEAN ENERGY
Efficiency Programs	)	AND THE SOUTHERN
	)	ENVIRONMENTAL LAW CENTER
	)	TO DUKE ENERGY CAROLINAS,
	)	LLC – 3RD REQUEST

4. Testimony of Mr. Rogers. Page 12, line 15 to page 13 line 9, regarding "Save-a-Watt" and Testimonies of Ms. Sadowsky and Mr. Dwight. Please explain why the Company is considering purchasing electricity from conventional or renewable energy sources, as noted in its 2007 Annual Plan, if it would not earn a return on those purchases.

RESPONSE: As part of the resource planning process for future generation needs, multiple supply-side and demand-side options are considered to assure the resource portfolio selected provides the best value to customers. The supply options typically evaluated are self-build, purchased power, or acquisition of assets.

With regard to renewable resources, the Company will comply with the statutory requirements for renewable energy in North Carolina. Because of Duke Energy's limited experience in owning or operating this type of resource, the Company will, at least initially, likely rely more heavily on purchased power agreements rather than ownership to secure these resources.

5. Testimony of Ms. Ruff, page 12, lines 12 to 14, regarding energy efficiency at a lower cost. Please explain why no analysis was prepared by, or for, the Company comparing the costs that customers will pay for energy efficiency under the energy efficiency Rider to the costs that customers would pay for the exact same mix and level of energy efficiency under a cost-of-service-based compensation mechanism that allows recovery of direct program costs, net lost margin and a financial incentive based upon performance.

RESPONSE: The save-a-watt model, by design, will cost less than the supply-side alternative. Duke Energy believes that in order to achieve significant and sustainable investments in energy efficiency by utilities, an appropriate regulatory mechanism needs to exist to balance the needs of customers and shareholders. Duke Energy believes that the save-a-watt model is a superior approach to the traditional cost plus regulatory mechanism. While the traditional approach has been implemented in other states, we are not seeking to implement the status quo. By rewarding the utility on results achieved versus dollars spent, the Company will be rewarded for investing in and implementing new technologies and programs that will achieve the most energy savings. The save-a-watt approach will drive the innovation of new technologies as well as drive good management decisions to reduce the costs of implementing programs.

See the attached confidential financial detail file for a comparison of costs under the save-a-watt and shared savings compensation models prepared at the request of the Public Staff.

6. Testimony of Mr. Farmer, page 20, line 18 to page 21, line 7 regarding “billing factors” and Exhibit 3. Assume the Company has a general rate case in Year 3 in which it uses Year 2 as a test year. Further assume that the Commission approves new base rates effective on January 1 of Year 4 that reflect a new lower set of annual sales. The new lower annual test year sales level reflects the cumulative reduction in annual energy due to save a watt in Years 1 and 2.
 - a. How would the new, lower level of test year sales effective January 1 of Year 4 affect the calculation of the billing factor. Please provide all calculations.
 - b. How would the new, lower level of test year sales effective January 1 of Year 4 affect the Year 4 calculations in Farmer Exhibit 3. Please provide all calculations.

RESPONSE: Duke Energy Carolinas objects to this request on the grounds that the request is ambiguous and does not specify whether the presumed reduction in “annual sales” is meant to mean annual jurisdictional revenues or whether the question is intended to mean a presumed reduction in annual kilowatt-hour sales. Furthermore, Duke Energy Carolinas objects to the request because it requests the Company to engage in speculation and to perform original work. Nevertheless and without waiving this objection, the Company states as follows:

- a. The Company’s calculation of estimated Rider EE billing factors for the first four years of the Company’s Energy Efficiency Plan shown on Farmer Exhibit 3 include an estimate of the reduction in kilowatt-hour sales applicable to demand response and energy efficiency initiatives. The estimated reduction in annual kilowatt-hour sales attributable to the Company’s Energy Efficiency Plan is not limited to those reductions that may occur during years 1 and 2 but also includes estimates of reductions in kilowatt-hour sales for years 3 and 4.
 - b. See the response to “a” above.
 - c. The Company cannot speculate as to whether new base rates from test period sales levels would eliminate any “net lost margin or net lost revenue” caused by the cumulative reduction in annual energy due to save a watt without a clear understanding of the assumptions embedded within the hypothetical question. For example, would test period revenues include revenues billed under the Company’s proposed Energy Efficiency Plan, or, does the question assume that revenues billed under the Company’s proposed Energy Efficiency would be excluded from the hypothetical test period? If the test period included revenues billed under Rider EE, would the balance adjustment in Rider EE be reconciled (i.e, synchronized) with test period results?
7. Page 7, lines 15-19 of J. Danny Wiles’ testimony reads “Duke Energy Carolinas requests Commission approval to account for the impacts of the proposed regulatory treatment in its Quarterly NCUC Form E.S.-1 Reports as follows: the Company will include...expenses

calculated as **the greater of 90% of the avoided generation costs as calculated in Rider EE (NC), or actual program costs incurred.**" (Emphasis added.)

- a. Please explain how the data that the Company reports in Quarterly NCUC Form E.S.-1 are used.
- b. Does this statement mean that for purposes of determining its annual net income before taxes the Company will claim as expenses "the greater of 90% of the avoided generation costs as calculated in Rider EE (NC) or actual program costs incurred"? If so, please provide the justification for treating that amount as expenses.

RESPONSE:

- a. **The Quarterly NCUC Form E.S.-1 reports are required to be filed by the North Carolina Utilities Commission and the data is used in this report to meet the reporting requirements objective outlined in the Commission's quarterly report as quoted below.**

A specific objective of this reporting process is to present to the Commission, on an ongoing basis, meaningful information regarding the financial viability of the subject companies, including the reasonableness of the overall levels of rates and charges currently being charged by jurisdictional utilities, whose rates are cost based, for their sales of services. Cost based regulation is synonymous with rate base, rate of return regulation.

Under rate base, rate of return regulation, the cost of service of a public utility is defined as the sum total of reasonable operating expenses, depreciation, taxes, and a reasonable return on the net valuation of property used and useful in providing public utility services. Therefore, the reasonableness of a public utility's rates is a function of the reasonableness of the level of each individual component of its cost of service.

- b. **If actual program costs incurred are greater than 90% of avoided costs, including actual program costs as an expense in the Company's NCUC Form ES-1 report will reflect a return calculated using the actual losses the Company will incur by implementing its SAW program. If actual program costs incurred are less than 90% of avoided costs, including 90% of avoided costs as an expense in the Company's NCUC Form ES-1 report will reflect a return assuming the Company incurred 90% of avoided costs.**

CERTIFICATE OF SERVICE

I hereby certify that the following persons on the docket mailing list have been served with the Testimony of J. Richard Hornby (Public Version of Hornby Exhibit 2) on behalf of Environmental Defense Fund, Natural Resources Defense Council, Southern Alliance for Clean Energy and Southern Environmental Law Center by deposit in the U.S. Mail, postage prepaid:

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This 26th day of June 2008.


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