BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 979

In the Matter of Application of Duke Energy Carolinas, LLC For Approval of Vintage 3 Rider EE	))))	APPLICATION OF DUKE ENERGY CAROLINAS, LLC FOR APPROVAL OF VINTAGE 3 RIDER EE

Pursuant to N.C. Gen. Stat. § 62-133.9 and Rule R8-69 of the Rules and Regulations of the North Carolina Utilities Commission (the "Commission"), Duke Energy Carolinas, LLC ("Duke Energy Carolinas" or the "Company") hereby applies to the Commission for approval of its demand-side management ("DSM") and energy efficiency ("EE") cost recovery rider, Rider EE, for Vintage 3 ("Rider 3"), which incorporates the third vintage of the Company's DSM and EE programs, the second year of net lost revenues for Vintage 2 EE programs, and includes a participation true-up for Vintage 1 programs.

In support of this Application, Duke Energy Carolinas respectfully shows the Commission the following:

Name and Address of Duke Energy Carolinas

1. The correct name and post office address of the Company are Duke Energy Carolinas, LLC, Post Office Box 1006, Charlotte, North Carolina 28201-1006.

Notices and Communications

2. The names and addresses of the attorneys of Duke Energy Carolinas who are authorized to receive notices and communications with respect to this Application are:

Robert W. Kaylor
Law Office of Robert W. Kaylor, P.A.
225 Hillsborough Street
Hillsborough Place, Suite 160
Raleigh, North Carolina 27603

Molly L. McIntosh
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Hearst Tower, 47th Floor
214 North Tryon Street
Charlotte, North Carolina 28202

Description of the Company

3. The Company is engaged in the generation, transmission, distribution, and sale of electric energy at retail in the central and western portions of North Carolina and the western portion of South Carolina. It also sells electricity at wholesale to many municipal, cooperative, and investor-owned electric utilities. Duke Energy Carolinas is a public utility under the laws of North Carolina and is subject to the jurisdiction of this Commission with respect to its operations in this State. The Company also is authorized to transact business in the State of South Carolina and is a public utility under the laws of that State. Accordingly, its operations in South Carolina are subject to the jurisdiction of the Public Service Commission of South Carolina.

4. N.C. Gen. Stat. § 62-133.9(d) authorizes the Commission to approve an annual rider to the rates of electric public utilities to recover all reasonable and prudent costs incurred for the adoption and implementation of new DSM and EE programs. Recoverable costs include, but are not limited to, all capital costs, including cost of capital and depreciation expense, administrative costs, implementation costs, incentive payments to program participants, and operating costs. Such rider shall consist of the utility's forecasted cost during the rate period and an experience modification factor ("EMF") rider to collect the difference between the utility's

actual reasonable and prudent costs incurred during the test period and actual revenues realized during the test period. The Commission is also authorized to approve incentives for adopting and implementing new DSM and EE programs, including appropriate rewards based on capitalization of a percentage of avoided costs achieved by DSM and EE measures.

5. The Commission approved Duke Energy Carolinas' modified save-a-watt portfolio of DSM and EE measures in Docket No. E-7, Sub 831 on February 26, 2009, and approved the modified save-a-watt compensation mechanism, as set forth in the Agreement and Joint Stipulation of Settlement between the Company, the Public Staff, and Southern Alliance for Clean Energy, Environmental Defense Fund, Natural Resources Defense Council, and the Southern Environmental Law Center ("Settlement Agreement"), in its *Order Approving Agreement and Joint Stipulation of Settlement Subject to Certain Commission-Required Modifications and Decisions on Contested Issues* issued February 9, 2010 in Docket No. E-7, Sub 831. The approved cost recovery model provides that the Company will be compensated based on predetermined percentages of the Company's capacity- and energy-related "avoided costs," an estimate of the cost of supplying electricity. These percentages include 75% of avoided capacity costs for DSM programs, and 50% of the net present value ("NPV") of the avoided energy costs plus 50% of the NPV of avoided capacity costs for EE programs. The Commission also authorized the Company to recover net lost revenues for 36 months for each installation of an EE measure during a given vintage year.[1]

6. The Commission-approved Settlement Agreement provides for a series of participation true-ups that will be conducted to update revenue requirements, including net lost

[1] As defined by the Settlement Agreement, a vintage year is the twelve month period in which a specific DSM or EE measure is installed for an individual participant or a group of participants.

revenues, based on actual customer participation results for each vintage. The participation true-ups for each vintage will incorporate the difference between 1) the revenues collected based on billings at 85% of targeted savings, which in turn are established based upon estimated participation levels and initial assumptions of load impacts; and 2) the amount of revenues that the Company is permitted to collect under the Settlement Agreement based on actual participation levels applied to the initial assumptions of load impact or independently measured and verified results.

7. Rule R8-69(b) provides the Commission will each year conduct a proceeding for each electric public utility to establish an annual DSM/EE rider to recover DSM/EE related costs.

8. Pursuant to the provisions of N.C. Gen. Stat. § 62-133.9 and Rule R8-69, the Company requests the establishment of Rider 3 to recover the estimated revenue requirements for the Company's third vintage of programs, the second year of net lost revenues for Vintage 2, and the true-up, or EMF, for Vintage 1, as provided by the Commission-approved modified save-a-watt compensation mechanism.

9. Pursuant to the provisions of N.C. Gen. Stat. § 62-133.9 and Rule R8-69, the Company requests Commission approval of the following annual billing adjustments (all shown on a cents per kWh basis, including gross receipts tax and regulatory fee):

Residential Billing Factors	**¢/kWh**
Residential Billing Factor for Rider 3 Prospective Components	0.1371
Residential Billing Factor for Rider 3 EMF Component (Vintage 1 True-up)	0.0992
Residential Rider 3 (Total)	0.2363

Non-Residential Billing Factors for Rider 3 Prospective Components	¢/kWh
Vintage 2 EE participant	0.0037
Vintage 3 EE participant	0.0406
Vintage 3 DSM participant	0.0526

Non-Residential Billing Factors for Rider 3 EMF Component (Vintage 1 True-up)	¢/kWh
Vintage 1 EE participant	0.0218
Vintage 1 DSM participant	0.0205

Consistent with the Commission's *Order on Motions for Reconsideration* issued on June 3, 2010 in Docket No. E-7, Sub 938, Rider 3 will be in effect for the twelve month period January 1, 2012 through December 31, 2012. Also in accordance with this Order, the test period for the EMF component is the period from June 1, 2009 through December 31, 2010.

10. The Company has attached hereto as required by Rule R8-69, the direct testimony and exhibits of witnesses Jane L. McManeus, Timothy Duff and Ashlie J. Ossege in support of the requested change in rates.

WHEREFORE, the Company respectfully prays:

That consistent with this Application, the Commission approves the changes to its rates as set forth in paragraph 9 above.

Respectfully submitted, this the 23rd day of March, 2011.

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COUNSEL FOR DUKE ENERGY CAROLINAS, LLC

VERIFICATION

STATE OF NORTH CAROLINA)
COUNTY OF MECKLENBURG)

JANE L. MCMANEUS, being first duly sworn, deposes and says that she is MANAGING DIRECTOR, RATES of DUKE ENERGY CAROLINAS, LLC, applicant in the above-titled action; that she has read the foregoing Application and knows the contents thereof; and that the same is true of her own knowledge.

Jane L. McManeus

Jane L. McManeus

Sworn to and subscribed before me
this the 22 day of March, 2011.

Selene Henderson

Notary Public

My Commission Expires: 4-26-2011

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 979

In the Matter of	)	DIRECT TESTIMONY OF
Application of Duke Energy Carolinas, LLC	)	JANE L. MCMANEUS
For Approval of Vintage 3 Rider EE	)	FOR
	)	DUKE ENERGY CAROLINAS, LLC

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Jane L. McManeus. My business address is 526 South Church Street, Charlotte, North Carolina.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am Managing Director, Rates for Duke Energy Carolinas, LLC ("Duke Energy Carolinas" or the "Company").

Q. PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL QUALIFICATIONS.

A. I graduated from Wake Forest University with a Bachelor of Science in Accountancy and received a Master of Business Administration degree from the McColl Graduate School of Business at Queens University of Charlotte. I am a certified public accountant licensed in the state of North Carolina and am a member of the Southeastern Electric Exchange Rates and Regulation Section and the EEI Rate and Regulatory Analysts group. I began my career with Duke Power Company ("Duke Power") (now known as Duke Energy Carolinas) in 1979 as a staff accountant and have held a variety of positions in the finance organizations. From 1994 until 1999, I served in financial planning and analysis positions within the electric transmission area of Duke Power. I was named Director, Asset Accounting for Duke Power in 1999 and appointed to Assistant Controller in 2001. As Assistant Controller I was responsible for coordinating Duke Power's operational and strategic plans, including development of the annual budget and performing special studies. I joined the Rates Department in 2003 as Director, Rate Design and Analysis. In April 2006, I became Director, Regulatory Accounting and Filings, leading the regulatory accounting, cost of service, regulatory filings, and revenue analysis functions for Duke Energy Carolinas. I began my current position in the Rates Department in October 2006.

Q. PLEASE DESCRIBE YOUR DUTIES AS DIRECTOR, RATES FOR DUKE ENERGY CAROLINAS.

A. I am responsible for providing regulatory support for retail and wholesale rates, providing guidance on compliance with regulatory conditions and codes of conduct, and managing Duke Energy Carolinas' fuel, renewables compliance and energy efficiency cost recovery process.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?

A. Yes. I testified in Duke Energy Carolinas' most recent fuel charge adjustment proceedings in Docket Nos. E-7, Sub 847 and E-7, Sub 875. I also presented testimony in support of Duke Energy Carolinas' Application for Approval of Solar Photovoltaic Distributed Generation Program, in Docket No. E-7, Sub 856, and in support of the Company's renewable energy and energy efficiency standard rider in Docket No. E-7, Sub 872. I provided testimony supporting the base fuel factor in the Company's general rate case in Docket No. E-7, Sub 909. I testified in support of the Company's Renewable Energy and Energy Efficiency Portfolio Standard filing in Docket No. E-7, Sub 936. I also testified in support of Duke Energy Carolinas' Application to update its demand-side management ("DSM") and energy efficiency ("EE") cost recovery rider, Rider EE, to incorporate the second vintage ("Vintage 2") of programs in Docket No. E-7, Sub 941.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. My testimony supports Duke Energy Carolinas' Application for approval of its Rider EE for Vintage 3 ("Rider 3"), which incorporates the third vintage of the Company's DSM and EE programs and includes a participation true-up for Vintage 1 programs. In particular, I will discuss the key concepts and attributes of the proposed Rider 3, as well as the mechanics and calculations that are incorporated within Rider 3.

Q. PLEASE DESCRIBE THE EXHIBITS ATTACHED TO YOUR TESTIMONY.

A. McManeus Exhibit 1 demonstrates how the Company derived the prospective rate components of Rider 3 for residential and non-residential customers. McManeus Exhibit 2 provides information regarding the allocation of Duke Energy Carolinas' system totals to North Carolina and the allocation of North Carolina amounts between residential and non-residential customer classes, for the both the prospective rate components of Rider 3 as well as the Experience Modification Factor ("EMF") rate component of Rider 3. McManeus Exhibit 3 demonstrates how the Company derived the EMF rate components of Rider 3 for residential and non-residential customers, which reflects the true-up for Vintage 1. McManeus Exhibit 4 is the tariff for Rider 3.

Q. WERE MCMANEUS EXHIBITS 1-4 PREPARED BY YOU OR AT YOUR DIRECTION AND SUPERVISION?

A. Yes, they were.

Q. PLEASE PROVIDE AN OVERVIEW OF COST RECOVERY UNDER THE MODIFIED SAVE-A-WATT COMPENSATION MECHANISM.

A. In accordance with the modified save-a-watt compensation mechanism described in the Agreement and Joint Stipulation of Settlement between Duke Energy Carolinas, the Public Staff, and Southern Alliance for Clean Energy, Environmental Defense Fund, Natural Resources Defense Council, and the Southern Environmental Law Center filed June 12, 2009 in Docket No. E-7, Sub 831 ("Settlement Agreement") and approved in the

North Carolina Utilities Commission's (the "Commission") *Order Approving Agreement and Joint Stipulation of Settlement Subject to Certain Commission-Required Modifications and Decisions on Contested Issues* issued February 9, 2010 in the same Docket ("Order"), Rider EE is designed to allow Duke Energy Carolinas to collect a level of revenue equal to 75% of its estimated avoided capacity costs applicable to DSM programs and 50% of the net present value ("NPV") of estimated avoided capacity and energy costs applicable to EE programs, and to recover net lost revenues for EE programs only. Revenues collected under Rider EE are based on the expected avoided costs (and the associated net lost revenues) to be realized at an 85% level of achievement of the Company's avoided cost savings target for the applicable vintage per the Settlement Agreement.

Billing factors for Rider EE are calculated separately for residential and non-residential customers. The residential charge is calculated based on the avoided costs of programs targeted to residential customers; the non-residential charge is calculated based on the avoided costs of programs targeted to non-residential customers.

The recovery mechanism employs a vintage year concept and the Company plans four calendar year vintages during its modified save-a-watt limited term pilot. The recovery includes annual lost revenues associated with each vintage of EE programs for a three year period, therefore, the recovery of lost revenues applicable to EE programs for vintage years three and four will extend one year and two years beyond the initial four-year cost recovery period, respectively, unless terminated or adjusted by another regulatory action.

The Settlement Agreement provides for a series of participation true-ups, or Experience Modification Factors, that will be conducted periodically to update revenue requirements, including net lost revenues, based on actual customer participation results for each vintage. The participation true-ups for each vintage will incorporate the difference between 1) the revenues collected based on billings at 85% of targeted savings, which in turn are established based upon estimated participation levels and initial assumptions of load impacts; and 2) the amount of revenues that the Company is permitted to collect under the Settlement Agreement based on actual participation levels applied to the initial assumptions of load impact or independently measured and verified results applied prospectively. Actual participation data will be utilized to revise forecasts of customer participation in the Company's EE and DSM programs for purposes of billing future vintages. The participation true-ups will also provide the opportunity to recover the cost of pilot programs or new programs introduced during a vintage year.

During the four-year term of the program, the measurement and verification process will produce updated load impact results that will be incorporated into the development of revenue requirements for future vintages.[1] After the end of the four-year modified save-a-watt pilot, the Company will perform a final true-up process. This process will include a final comparison of the revenues collected from customers through the Rider EE to the amount of revenue the Company is authorized to collect from customers based on the independently measured and verified results applied prospectively as described in the Settlement Agreement. Any difference will be flowed

[1] Settlement Agreement section I.4. states "the initial estimates of load impact and free ridership (gross to net) will be used until the first set of impact evaluations is completed. The results from those impact evaluations will then be used prospectively until the next set is completed."

through to customers or will be collected from customers, as the case may be. If there are amounts owed to customers, such amounts will be refunded with interest.

The final true-up process also will include calculations that determine the earnings for the entire program and ensure that the level of compensation recovered by the Company is capped so that the after-tax rate of return on actual program costs applicable to EE and DSM programs does not exceed the predetermined earnings cap levels set out in the Settlement Agreement. Any excess earnings collected from customers will be refunded to customers with interest. The interest rate on any over-collection will be at a rate to be determined by the Commission in the first true-up proceeding in which an over-collection occurs.

Q. PLEASE EXPLAIN THE OPT-OUT PROCESS FOR NON-RESIDENTIAL CUSTOMERS.

A. In its *Order Granting Waiver, in Part, and Denying Waiver, in Part* ("Waiver Order") issued April 6, 2010 in Docket No. E-7, Sub 938, the Commission approved, in part, Duke Energy Carolinas' request for waiver of Commission Rule R8-69(d)(3), thereby allowing the Company to permit qualifying non-residential customers[2] to opt out of the DSM and/or EE portion of Rider EE during annual election periods. If a customer opts into a DSM program (or never opted out), it is required to participate for three years in the approved save-a-watt DSM programs and rider. If a customer chooses to participate in an EE program (or never opted out), that customer is required to pay the EE-related avoided cost revenue requirements and the net lost revenues for the corresponding

[2] Individual commercial customer accounts with annual energy usage of not less than 1,000,000 kWh and any industrial customer account.

vintage of the programs in which it participated. Customers that opt out of the Company's DSM and/or EE programs would remain opted-out for the term of the save-a-watt pilot, unless they choose to opt back in during any of the succeeding annual election periods, which occur from November 1 to December 31 each year. If a customer participates in any vintage of programs, the customer is subject to all true-up provisions of the approved Rider EE for any vintage in which the customer participates.

Q. WHAT ARE THE COMPONENTS OF RIDER 3?

A. The proposed Rider 3 consists of three distinct components: (1) a prospective Vintage 3 component designed to collect the estimated revenue requirements, including net lost revenues, for the Company's third vintage of programs; and (2) a prospective Vintage 2 component to recover the second year of estimated net lost revenues for Vintage 2 EE programs; and (3) an EMF component, which consists of the participation true-up for Vintage 1.

Q. WHAT IS THE RATE PERIOD FOR THE VINTAGE 3 COMPONENT OF RIDER 3?

A. In accordance with the Commission's *Order on Motions for Reconsideration* issued on June 3, 2010 in Docket No. E-7, Sub 938 ("Second Waiver Order"), the Company has calculated the Vintage 3 component of Rider 3 using the rate period January 1, 2012 through December 31, 2012.

Q. WHAT IS THE TEST PERIOD FOR THE EMF COMPONENT?

A. Pursuant to the Second Waiver Order, the "test period," for purposes of the modified save-a-watt portfolio of programs, is defined as the most recently completed vintage year at the time of the Company's Rider EE cost recovery application filing date, which in this case is Vintage 1. Accordingly, the test period is June 1, 2009 through December 31, 2010.

RIDER 3 PROSPECTIVE COMPONENTS

Q. WILL YOU PLEASE DESCRIBE THE BASIS FOR THE RATE PERIOD REVENUE REQUIREMENTS?

A. The estimated revenue requirements for Vintage 3 are determined separately for residential and non-residential customer classes and are based on the expected avoided costs (and associated net lost revenues) to be realized at an 85% level of achievement of targeted savings. The Commission-approved modified save-a-watt cost recovery mechanism provides for recovery of 75% of avoided cost savings from DSM programs and 50% of avoided cost savings from EE programs. In addition, the Company has approval to recover three years of lost revenues for each vintage of EE programs. As a result, the revenue requirements for the Vintage 3 component of proposed Rider 3 include: (1) the avoided cost revenue requirements for Vintage 3 DSM programs; (2) the avoided cost revenue requirements and the first year of net lost revenues for Vintage 3 EE programs.

In addition, the estimated net lost revenues associated for year 2 of Vintage 2 EE programs are included in Rider 3. The estimated net lost revenues have been updated to incorporate found revenues not included in the original estimates.

Q. IS THE THIRD YEAR OF NET LOST REVENUES FOR VINTAGE 1 INCLUDED IN THE RATE PERIOD REVENUE REQUIREMENTS?

A. No. The Settlement Agreement provides that the recovery of net lost revenues shall cease upon the implementation of new rates in a general rate case to the extent that the new rates are set to recover net lost revenues. The Company plans to file a general rate case this Summer for a rate period of January 1, 2012 through December 31, 2012 and based on a test period of January 1, 2010 through December 31, 2010. Because Vintage 1 overlaps with the test period for the upcoming rate case, the net lost revenues for year 3 of Vintage 1 will be captured in the new rates effective January 1, 2012, and therefore cannot be included in the proposed Rider 3 which is also effective January 1, 2012. In other words, the Company is not including net lost revenues for year 3 of Vintage 1 in Rider 3 to avoid double recovery of those lost revenues.

Q. HOW ARE REVENUE REQUIREMENTS FOR THE PROSPECTIVE COMPONENTS ALLOCATED TO THE NORTH CAROLINA RETAIL JURISDICTION AND TO THE RESIDENTIAL AND NON-RESIDENTIAL RATE CLASSES?

A. Revenue requirements for the Company's DSM and EE programs are recovered from only the class or classes of retail customers to which the programs are targeted. The revenue requirements for EE programs targeted at retail residential customers across North Carolina and South Carolina are allocated to North Carolina retail jurisdiction based on the ratio of North Carolina retail kWh sales to total retail kWh sales, and then recovered only from North Carolina residential customers. The revenue requirements for EE programs targeted at retail non-residential customers across North Carolina and South Carolina are allocated to North Carolina retail jurisdiction based on the ratio of North Carolina retail kWh sales to total retail kWh sales, and then recovered from only North Carolina retail non-residential customers. For DSM programs, because residential and non-residential programs are similar in nature, the revenue requirement for all retail DSM programs targeted at both residential and non-residential customers across North Carolina and South Carolina are allocated to North Carolina retail jurisdiction based on North Carolina retail contribution to retail system peak demand. The North Carolina retail revenue requirements are then allocated between residential and non-residential customers based on each group's contribution to the North Carolina retail peak demand. Consistent with the Commission's Order, no costs will be allocated to wholesale jurisdiction. McManeus Exhibit 2 illustrates the allocations described above.

Q. HOW ARE THE BILLING FACTORS FOR THE PROSPECTIVE COMPONENTS OF RIDER 3 CALCULATED?

A. McManeus Exhibit 1 demonstrates the calculations of the residential and non-residential billing factors. The numerator of the residential billing factor is calculated by first adding the DSM component of the avoided cost revenue requirement to the EE component of the avoided cost revenue requirement to get the residential avoided cost revenue requirement. The residential avoided cost revenue requirement is then multiplied by the gross receipts tax and regulatory fee factor to obtain the adjusted residential avoided cost revenue requirement. This figure is then added to net lost revenues for the second year of Vintage 2 programs and net lost revenues for the first year of Vintage 3 programs to obtain the Residential Save-a-Watt Revenue Requirement,[3] the numerator of the billing factor. The Residential Save-a-Watt Revenue Requirement is then divided by a denominator consisting of the projected North Carolina residential retail kWh sales for Vintage 3 to obtain the residential billing factor. The calculation of the non-residential billing factors is essentially the same, using non-residential inputs instead. However, because non-

[3] Revenue requirements are set at 85% achievement of target avoided costs savings.

residential customers are allowed to opt out of either DSM or EE programs separately in an annual election, non-residential billing factors have been separately computed for DSM versus EE programs and within EE programs, by vintage. In addition, the projected non-residential sales in the denominator of the rate calculations reflect the sales of non-residential customers who have not opted out of paying the Rider EE.

Q. PLEASE EXPLAIN THE DETAILS OF THE CALCULATION OF THE DSM COMPONENT OF THE AVOIDED COST REVENUE REQUIREMENT INCLUDED IN THE COMPANY'S PROSPECTIVE COMPONENTS OF PROPOSED RIDER 3.

A. The DSM component is calculated by multiplying the following three figures: (1) projected kW demand impacts for the DSM measures for Vintage 3; (2) the Company's annual avoided capacity costs per kW; and (3) 75%. Projected demand impacts are an output of the DSMore model. Company witness Ashlie Ossege's testimony in this Docket includes a discussion and explanation of how demand impacts are determined using this model. Pursuant to the Settlement Agreement, the annual avoided capacity costs per kW are from the Company's Avoided Cost Filing in Docket No. E-100, Sub 106 ("Avoided Cost Filing"), escalated using the filed escalation factor for capital costs, to obtain nominal year dollar values for each year of the program or measure. Seventy-five percent, of course, is the percentage of avoided costs for DSM to be collected through Rider EE pursuant to the Settlement Agreement.

Q. PLEASE EXPLAIN THE DETAILS OF THE CALCULATION OF THE EE COMPONENT OF THE AVOIDED COST REVENUE REQUIREMENT INCLUDED IN THE COMPANY'S PROPOSED RIDER 3.

A. The EE component is the sum of the avoided cost of capacity revenue requirement for EE programs and the avoided cost of energy revenue requirement for EE programs. The avoided cost of capacity revenue requirement is calculated by first multiplying the projected kW demand impacts for the EE programs (from DSMore) by the annual avoided capacity costs per kW from the Avoided Cost Filing. The next step is to take the NPV of this number. Finally, the avoided capacity cost revenue requirement is multiplied by 50%, *i.e.*, the percentage of avoided costs for EE to be collected through Rider EE pursuant to the Settlement Agreement.

The avoided cost of energy revenue requirement is calculated by first multiplying the projected kWh energy impacts for the EE programs by the Company's annual avoided energy costs. The next step is to take the NPV of this number and then multiply by 50%.

The energy impacts (*i.e.*, kWh impacts) of each EE measure are obtained from the DSMore analyses described by witness Ossege. These impacts represent an estimate of load reductions that will occur on Duke Energy Carolinas' system for each hour of each day of the year. The hourly kWh reductions are multiplied by the hourly marginal energy costs from the production costing model used by Duke Energy Carolinas in its Integrated Resource Plan analysis in order to estimate the savings that customers will realize.

Q. HAVE THE AVOIDED ENERGY AND CAPACITY COSTS BEEN UPDATED TO REFLECT THE AVOIDED COST RATES FROM THE COMPANY'S MOST RECENT AVOIDED COST FILING?

A. No. The Settlement Agreement provides that the avoided energy costs and avoided capacity costs are fixed at the outset of the four-year pilot and may only be revised if the

Company's combined avoided energy and capacity costs increase or decrease by more than 25%. The combined avoided costs from the Company's most recent avoided cost filing in Docket No. E-100, Sub 127 compared to the Company's avoided costs from its Avoided Cost Filing in Docket No. E-100, Sub 106 are not 25% higher or lower. Therefore, the Company's avoided energy and capacity costs for EE and DSM programs have not been updated.

Q. HOW WERE THE NET LOST REVENUES INCLUDED IN RIDER 3 DETERMINED?

A. Net lost revenues were estimated by multiplying the portion of the Company's tariff rates that represent the recovery of fixed costs by the estimated kW and kWh reductions applicable to EE programs. The Company calculated the portion of retail tariff rates (including riders) representing the recovery of fixed costs by deducting the recovery of fuel and variable O&M costs from its tariff rates.

Net lost revenues included in the prospective components of Rider 3 comprise two vintages. The rates used for year 2 net lost revenues associated with Vintage 2 are the rates in effect at January 1, 2011. The rates used for the first year of net lost revenues for Vintage 3 are also the rates in effect at January 1, 2011.

For the Vintage 2 net lost revenues, the kWh reductions to which the fixed cost rates are applied reflect 12 months of expected reductions, representing the second full year out of the total three years of net lost revenues recoverable for each applicable vintage. For the Vintage 3 net lost revenues, the kWh reductions to which the fixed costs rates are applied reflect an assumption that enrollment in programs will be staggered throughout the year. A "half-year convention" (*i.e.*, 6 months of net lost revenues) has been used to minimize the potential for over-collection.

Q. IS THE COMPANY REQUESTING NET LOST REVENUES FOR ALL OF ITS PROGRAMS?

A. No. Pursuant to the Settlement Agreement and Order, the Company is not requesting net lost revenue recovery for its DSM measures.

Q. DOES THE DETERMINATION OF NET LOST REVENUES REFLECT "FOUND" REVENUES?

A. As described in the testimony of Company witness Timothy Duff, the Vintage 3 component of Rider 3 contains an estimate of found revenues to offset lost revenues for year 1 of Vintage 3 programs. In addition, the Vintage 2 lost revenue component of Rider 3 has been adjusted by an estimate of found revenues for year 2 of Vintage 2 programs. Finally, the EMF component of Rider 3, which trues up for participation in Vintage 1, incorporates found revenues into the true-up of lost revenues for year 1 of Vintage 1.

Q. ARE SALES AND DEMAND ADJUSTED FOR THE IMPACT OF "OPT-OUT" CUSTOMERS IN DETERMINING VINTAGE 3 REVENUE REQUIREMENTS?

A. Yes. Because there has been no election period related to Vintage 3 yet, the Company has used the information currently known regarding Vintage 2 opt-out elections as an estimate of Vintage 3 elections. The Company will reflect the actual opt-out results for Vintage 3 in the associated participation true-up.

Q. WHAT OTHER ADJUSTMENTS ARE MADE RELATED TO "OPT-OUT" CUSTOMERS?

A. The impact of opt-out results is also considered in the development of the Rider EE billing rates. Since the revenue requirements will not be recovered from non-residential customers that opt out of the Company's programs, the forecasted sales used to compute the rate per kWh for non-residential rates exclude sales of customers that have opted out of the vintage to which the rate applies.

Q. DO THE ESTIMATED REVENUE REQUIREMENTS FOR THE VINTAGE 3 COMPONENT OF RIDER 3 REFLECT UPDATED LOAD IMPACT RESULTS FROM THE MEASUREMENT AND VERIFICATION PROCESS?

A. As explained in the testimony of witnesses Duff and Ossege, at the time of this filing, the Company had received load impact results for only its Compact Fluorescent Light Bulb ("CFL") measure. Accordingly, the Vintage 3 component of Rider 3 incorporates the updated CFL load impact results in the estimates of avoided cost revenue requirements for Vintage 3 DSM programs, avoided cost revenue requirements for Vintage 3 EE programs, and the first year of net lost revenues for Vintage 3 EE programs.

Q. WHAT ARE THE COMPANY'S PROPOSED INITIAL BILLING FACTORS APPLICABLE TO NORTH CAROLINA JURISDICTIONAL ELECTRIC CUSTOMERS FOR THE PROSPECTIVE COMPONENTS OF RIDER 3?

A. The Company's proposed initial billing factor for the Rider 3 prospective components is 0.1371 cents per kWh for Duke Energy Carolinas' North Carolina retail residential customers. For non-residential customers, the amounts differ depending upon customer elections of participation. The following chart depicts the options and rider amounts:

Non-Residential Billing Factors for Rider 3 Prospective Components	¢/kWh
Vintage 1 EE participant	N/A[4]
Vintage 2 EE participant	0.0037
Vintage 3 EE participant	0.0406
Vintage 3 DSM participant	0.0526

These billing factors were determined based on jurisdictional revenue requirement levels that reflect the recovery of 75% of estimated avoided capacity costs for DSM, 50% of avoided capacity and energy costs for EE and net lost revenues for EE, calculated in accordance with the provisions of the Settlement Agreement as explained earlier in this testimony. In addition the revenue requirement levels included in the billing factors are based on 85% achievement of target savings.

TRUE-UP (EMF) COMPONENT

Q. WHAT IS BEING "TRUED-UP" FOR VINTAGE 1?

A. The chart below demonstrates which components of the Vintage 1 estimate filed in 2009 that the Company is "truing up" in the Vintage 1 EMF component of Rider 3. McManeus Exhibit 3 contains a detailed description of the true-up for Vintage 1.

	V1 Estimate (2010) As Filed (Filed 2009)	V1 True Up (2012) (Filed March 2011)
	Rider 1	**Rider 3 EMF**
Avoided Costs	As filed Avoided Cost Rates from Docket No. E-7, Sub 106	As filed Avoided Cost Rates from Docket No. E-7, Sub 106
Lost Revenues	Estimated participation assuming 1/1/10 sign up date	Update for actual participation and actual 2010 rates
Participation	Estimated participation assuming	Update for actual participation

[4] The third year of net lost revenues for Vintage 1 will be collected through base rates as discussed on page 10 above.

	1/1/10 sign up date	
Found Revenues	N/A (Commission's order regarding found revenues not yet issued)	Update for actual according to Commission-approved guidelines
M&V	Initial assumptions of load impacts	Initial assumptions of load impacts
New Programs	Only includes programs approved prior to estimated filing	Update for new programs and pilots approved and implemented since estimated filing

Q. WHY ARE THE AVOIDED COSTS RATES UNCHANGED?

A. As discussed above, since the Company's combined avoided energy and capacity costs have not increased or decreased more than 25% from those fixed at the outset of the Settlement Agreement, the Company must use its avoided costs from the Avoided Cost Filing in Docket No. E-100, Sub 106.

Q. WHY ARE THE LOAD IMPACTS UNCHANGED?

A. Settlement Agreement section I.4. states "the initial estimates of load impact and free ridership (gross to net) will be used until the first set of impact evaluations is completed. The results from those impact evaluations will then be used prospectively until the next set is completed." In other words, the measurement and verification process will produce updated load impact results that will be incorporated into the development of revenue requirements for future vintages. Because no impact evaluations were completed prior to or during Vintage 1, the initial estimates of load impact and free ridership are used for this true-up.

For DSM programs, the contracted amounts of kW reduction capability from participants are considered to be components of actual participation. As a result, the Vintage 1 true-up reflects the actual quantity of demand reduction capability for the Vintage 1 period.

After the end of the four-year modified save-a-watt pilot, the Company will perform a final true-up process, which will include a final comparison of the revenues collected from customers through Rider EE to the amount of revenue the Company is authorized to collect from customers based on the independently measured and verified results applied prospectively as described in the Settlement Agreement. Any difference will be flowed through to customers or will be collected from customers, as the case may be. If there are amounts owed to customers, such amounts will be refunded with interest.

Q. WHY DID THE COMPANY USE 85% ACHIEVEMENT OF TARGET AVOIDED COST SAVINGS TO CALCULATE THE TRUE UP FOR VINTAGE 1?

A. Pursuant to the Settlement Agreement, the Company uses 85% achievement of target avoided cost savings to calculate the prospective components of Rider EE and is authorized to collect the difference the revenues collected (based on billings at 85% of targeted savings) and the amount of revenues that the Company is authorized to collect based on actual participation levels applied to the initial assumptions of load impact through the participation true-up. As discussed by witness Duff, since the modified save-a-watt pilot program spans four vintage years and is subject to a final true up and an earnings cap applied to the entire program after the end of four years, the Company is taking into consideration that early strong results in one vintage may result in lesser achievements in a future vintage. In order to avoid collecting amounts from customers early in the program and potentially refunding amounts later in the program, the Company has elected to calculate the true-up amounts for Vintage 1 only using 85% achievement of target avoided costs savings. McManeus Exhibit 3 shows the under-collection Duke Energy Carolinas would have experienced if the Company had not elected for purposes of Vintage 1 only, to calculate the true-up using 85% achievement of target avoided costs savings.

Q. HOW WERE LOST REVENUES UPDATED FOR ACTUAL PARTICIPATION?

A. The actual net lost revenues for residential customers for year one of Vintage 1 were calculated by using a weighted average residential rate applied to residential kW and kWh savings. The actual net lost revenues for non-residential customers for year one of Vintage 1 were calculated by using a weighted average non-residential rate applied to non-residential kW and kWh savings. The rates used in the Vintage 1 true-up for year 1 of net lost revenues are the rates that were in effect for the period June 2009 through December 2010. The actual kW and kWh savings were as experienced during the period June 2009 through December 2010. The lost revenues were then offset by actual found revenues for year one of Vintage 1 as explained by witness Duff.

Q. WHY WERE THE LOST REVENUES NOT CALCULATED BY INDIVIDUAL RATE SCHEDULE?

A. The actual net lost revenues for year one of Vintage 1 for residential customers were calculated by taking the weighted average of the two residential rate schedules RS and RE for simplicity. The actual net lost revenues for year one of Vintage 1 for non-residential customers were calculated by taking the weighted average of Schedules OPT-I and OPT-G, the two rate schedules that have the most participation in save-a-watt programs. This simplifying assumption does not materially affect the result, and is actually skewed in favor of customers because the non-residential rate schedules used have the lowest tail block rates.

Q. WHY WERE LOST AND FOUND REVENUES COMPUTED AT THE NC RETAIL LEVEL INSTEAD OF AN ALLOCATION OF SYSTEM LOST REVENUES?

A. For purposes of truing up lost revenues to actual, the Company used the actual kW and kWh saved in North Carolina, rather than a system allocation, because this produces a result that aligns with how fixed costs would be recovered from retail customers in base rates. In a rate case to set base rates, fixed costs are allocated among rate jurisdictions and compared to the level of revenues collected from the rate jurisdictions to determine any excess or deficiency in cost recovery. If actual kWh savings for North Carolina retail and South Carolina retail were experienced in different proportions than fixed costs would be assigned in a rate case, one jurisdiction would subsidize another in terms of fixed costs, and the proper allocation of fixed costs would not be maintained. Determining lost revenues for North Carolina retail jurisdiction based on actual North Carolina retail kWh savings and rates maintains the proper allocation of fixed costs among rate jurisdictions. Following the same logic, found revenues help offset lost revenues in the state in which the found revenues occur. Accordingly, South Carolina found revenues should not be used to offset North Carolina lost revenues.

Q. WHAT ARE THE COMPANY'S PROPOSED EMF BILLING FACTORS APPLICABLE TO NORTH CAROLINA JURISDICTIONAL ELECTRIC CUSTOMERS FOR THE VINTAGE 1 TRUE-UP COMPONENT OF RIDER 3?

A. The Company's proposed EMF billing factor for the Vintage 1 true-up component of Rider 3 is 0.0992 cents per kWh for Duke Energy Carolinas' North Carolina retail residential customers. For non-residential customers, the amounts differ depending upon customer elections of participation. The following chart depicts the options and rider amounts:

Non-Residential Billing Factors EMF Component (Vintage 1 True-up)	**¢/kWh**
Vintage 1 EE participant	0.0218
Vintage 1 DSM participant	0.0205

SUMMARY

Q. PLEASE SUMMARIZE THE SPECIFIC RATE MAKING APPROVAL REQUESTED BY DUKE ENERGY CAROLINAS.

A. Duke Energy Carolinas is seeking approval of Rider 3, which includes the formula for calculation of the Rider, as well as the charge to be effective for Vintage 3. As discussed above, the charge for Rider 3 contains a prospective Vintage 3 component; a prospective Vintage 2 component; and a Vintage 1 EMF component. Accordingly, the charge for Rider 3 for the Company's North Carolina retail residential customers is simply the sum of: (1) the residential billing factor for the prospective Rider 3 component; and (2) the residential billing factor for the Vintage 1 EMF component. The proposed charge for Rider 3 for the Company's non-residential customers is the sum of: (1) the non-residential billing factor(s) for the Vintage 3 component that apply to that non-residential customer based on its participation in EE and/or DSM programs; (2) the non-residential billing factor for Vintage 2 component that apply to that non-residential customer that participated in Vintage 2 EE programs; and (3) the non-residential billing factor(s) for the Vintage 1 EMF components that apply to that non-residential customer based on its participation in EE and/or DSM programs.

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes.

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Residential billing factor = Save-A-Watt Residential revenue requirement/Projected NC Residential retail kWh sales, where:

			Residential Estimated NC Retail Costs (2012 V3)
1	EE Avoided Cost Component	McManeus Exhibit 2 pg 2 Line 9*.85	$ 8,057,849
2	DSM Avoided Cost Component	McManeus Exhibit 2 pg 2 Line 17*.85	$ 10,792,839
3	Residential Avoided Cost Revenue Requirement	Line 1 + Line 2	$ 18,850,688
4	Gross Receipts Tax and Regulatory Fee Factor		1.034554
5	Adjusted Residential Avoided Cost Revenue Requirement	Line 3 * Line 4	$ 19,502,055
6	Net Lost Revenues	McManeus Exhibit 2 pg 2 Line 10*.85	$ 9,522,759
7	Residential Found Revenues	Workpapers pg 13 (D10 + D11)* .85	$ 218,853
8	Total Net Lost Revenues	Line 6 - Line 7	$ 9,303,906
9	Residential Save-A-Watt Revenue Requirement[1]	Line 5 + Line 8	$ 28,805,960
10	Projected NC Residential Sales (kWh) for rate period	Duff Exhibit 1	21,006,907,773
11	**Residential V3 Rider EE (cents per kWh)**	Line 9 / Line 10	**0.1371**

Non-Residential billing factor = Save-A-Watt Non-residential revenue requirement/Projected NC Non-Residential retail kWh sales, where:

			Non-Residential Estimated NC Retail Costs (2012 V3)	Non-Residential Estimated V2 EE Retail Costs	Non-Residential Estimated V3 EE Retail Costs	Non-Residential Estimated V3 DSM Retail Costs
1	EE Avoided Cost Component	McManeus Exhibit 2 pg 2 Line 11*.85	$ 10,062,327	$ -	$ 10,062,327	$ -
2	DSM Avoided Cost Component	McManeus Exhibit 2 pg 2 Line 18*.85	$ 12,644,414	$ -	$ -	$ 12,644,414
3	Non-Residential Avoided Cost Revenue Requirement	Line 1 + Line 2	$ 22,706,741	$ -	$ 10,062,327	$ 12,644,414
4	Gross Receipts Tax and Regulatory Fee Factor		1.034554		1.034554	1.034554
5	Adjusted Non-Residential Avoided Cost Revenue Requirement	Line 3 * Line 4	$ 23,491,350	$ -	$ 10,410,020	$ 13,081,329
6	Net Lost Revenue Vintage 1 (Year 3)[2]		$ -	$ -	$ -	$ -
7	Non-Residential Found Revenues Vintage 1 (Year 3)[2]			$ -	$ -	$ -
8	Net Lost Revenue Vintage 2 (Year 2)	McManeus Exhibit 2 pg 2 Line 12*.85	$ 2,146,418	$ 2,146,418	$ -	$ -
9	Non-Residential Found Revenues Vintage 2 Year 2	Workpapers pg 13 D3 * .85	$ 1,194,585	$ 1,194,585	$ -	$ -
10	Net Lost Revenue Vintage 3 (Year 1)	McManeus Exhibit 2 pg 2 Line 12*.85	$ 642,984	$ -	$ 642,984	$ -
11	Non-Residential Found Revenues Vintage 3 Year 1	Workpapers pg 13 D4 * .85	$ 582,451	$ -	$ 582,451	$ -
12	Total Net Lost Revenues		$ 1,012,367	$ 951,833	$ 60,533	$ -
13	Non-Residential Save-A-Watt Revenue Requirement[1]	Line 5 + Line 12	$ 24,503,716	$ 951,833	$ 10,470,554	$ 13,081,329
14	Projected Vintage 2 EE Participants NC Non-Residential Sales (kWh) for rate period	Duff Exhibit 1, Duff Exhibit 5		25,816,001,773		
15	Projected Vintage 3 EE Duff Exhibit 2 pg. 3	Duff Exhibit 1, Duff Exhibit 5			25,816,001,773	
16	Projected Vintage 3 D: Duff Exhibit 2 pg. 3	Duff Exhibit 1, Duff Exhibit 5				24,874,501,096
17	**Vintage 2 EE participant Non-Residential Rider EE (cents per kWh)**	Line 13/ Line 14		**0.0037**		
18	**Vintage 3 EE participant Non-Residential Rider EE (cents per kWh)**	(Line 3 * Line 4)+ Line 13/ Line 15			**0.0406**	
19	**Vintage 3 DSM participant Non-Residential Rider EE (cents per kWh)**	(Line 3 * Line 4)/ Line 16				**0.0526**

Notes:
(1) Revenue requirements are set at 85% achievement of target avoided cost savings
(2) Net Lost Revenues for Year 3 of Vintage 1 will be captured in 2011 Base Rates Case

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			2009 COS	2010 COS	
	Allocation 1 to state based on kWh sales				
1	NC Retail		73.0077318%	72.7072718%	
	Allocation 2 to state based on Peak demand				
2	NC Retail		73.8190005%	74.7893638%	
	Allocation 3 NC res vs. non-res Peak Demand				
3	NC Residential		45.9245801%	46.0499320%	
4	Non-Residential		54.0754199%	53.9500680%	
	System Revenue Requirement for Energy Efficiency Programs		2009 Actual	2010 Actual	Total V1 Actuals
5	Residential Avoided Costs - EE	Duff Exhibit 2 pg. 1 & 2	$ 3,652,401	$ 53,624,533	$ 57,276,934
6	Residential Net Lost Revenues - EE		$ -	$ -	$ -
7	Non-Residential Avoided Costs - EE	Duff Exhibit 2 pg. 1 & 2	$ 3,788,299	$ 16,514,405	$ 20,302,704
8	Non-Residential Net Lost Revenues - EE		$ -	$ -	$ -
	Total EE		$ 7,440,700	$ 70,138,938	$ 77,579,638
	Allocation to NC Retail Broken Down by Class and Type		2009	2010	Total V1 Actuals
9	Residential Avoided Costs - EE	Line 5 * Line 1	$ 2,666,535	$ 38,988,935	$ 41,655,470
10	Residential Net Lost Revenues - EE	Duff Exhibit 2 pg. 1 & 2	$ 177,629	$ 7,260,912	$ 7,438,541
11	Non-Residential Avoided Costs - EE	Line 7 * Line 1	$ 2,765,751	$ 12,007,173	$ 14,772,925
12	Non-Residential Net Lost Revenues - EE	Duff Exhibit 2 pg. 1 & 2	$ 167,083	$ 1,256,276	$ 1,423,359
			$ 5,776,998	$ 59,513,296	$ 65,290,295
	System Revenue Requirements for DSM Programs		2009	2010	Total V1 Actuals
13	Residential Avoided Costs - DSM	Duff Exhibit 2 pg. 1 & 2	$ 3,095,374	$ 12,441,995	$ 15,537,369
14	Non-Residential Avoided Costs - DSM	Duff Exhibit 2 pg. 1 & 2	$ 1,572,862	$ 11,213,345	$ 12,786,207
15	Total DSM	Line 13 + Line 14	$ 4,668,236	$ 23,655,340	$ 28,323,576
	Allocation of Total DSM to NC Retail				
16	Total DSM	Line 15 * Line 2	$ 3,446,045	$ 17,691,678	$ 21,137,723
	Allocation to Residential vs. Non Residential				
17	Residential Avoided Cost - DSM	Line 16 * Line 3	$ 1,582,582	$ 8,147,006	$ 9,729,588
18	Non - Residential Avoided Cost - DSM	Line 16 * Line 4	$ 1,863,463	$ 9,544,672	$ 11,408,136

Duke Energy Carolinas
DSM/EE Cost Recovery Rider 3 - Vintage 3 Estimate
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Line	Description	Source			
			2010 COS		
	Allocation 1 to state based on kWh sales				
1	NC Retail		72.7072718%		
	Allocation 2 to state based on Peak demand				
2	NC Retail		74.7893638%		
	Allocation 3 NC res vs. non-res Peak Demand				
3	NC Residential		46.0499320%		
4	Non-Residential		53.9500680%		
	System Revenue Requirement for Energy Efficiency Programs		2012 Estimate	Vintage 2	Vintage 3
5	Residential Avoided Costs - EE	Duff Exhibit 2 pg. 3	$ 13,038,341		
6	Residential Net Lost Revenues - EE	Duff Exhibit 2 pg. 3	$ 15,408,700	$ 13,181,788	$ 2,226,912
7	Non-Residential Avoided Costs - EE	Duff Exhibit 2 pg. 3	$ 16,281,771		
8	Non-Residential Net Lost Revenues - EE	Duff Exhibit 2 pg. 3	$ 4,115,652	$ 3,075,244	$ 1,040,407
	Total EE		$ 48,844,464		
	Allocation of Total EE to NC Retail	Sum (Line 5:Line 8) * Line 1	$ 35,513,477		
	Allocation to NC Retail Broken Down by Class and Type		2012 Estimate	Vintage 2	Vintage 3
9	Residential Avoided Costs - EE	Line 5 * Line 1	$ 9,479,822		
10	Residential Net Lost Revenues - EE	Line 6 * Line 1	$ 11,203,245		$ 1,619,127
11	Non-Residential Avoided Costs - EE	Line 7 * Line 1	$ 11,838,031		
12	Non-Residential Net Lost Revenues - EE	Duff Exhibit 2 pg. 3*	$ 3,281,650	$ 2,525,198	$ 756,452
			$ 35,802,749		
	System Revenue Requirements for DSM Programs		2012 Estimate		
13	Residential Avoided Costs - DSM	Duff Exhibit 2 pg. 3	$ 18,805,413		
14	Non-Residential Avoided Costs - DSM	Duff Exhibit 2 pg. 3	$ 18,062,449		
15	Total DSM	Line 13 + Line 14	$ 36,867,862		
	Allocation of Total DSM to NC Retail				
16	Total DSM	Line 15 * Line 2	$ 27,573,239		
	Allocation to Residential vs. Non Residential				
17	Residential Avoided Cost - DSM	Line 16 * Line 3	$ 12,697,458		
18	Non - Residential Avoided Cost - DSM	Line 16 * Line 4	$ 14,875,781		

*For estimating purposes, system lost revenues are allocated to North Carolina for programs offered in both North Carolina and South Carolina. For pilots offered only in North Carolina estimated net lost revenues are directly assigned to North Carolina.

Duke Energy Carolinas
DSM/EE Cost Recovery Rider 3
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Vintage 1 EMF

			Residential Actual NC Retail Costs Vintage 1	(Over)/Under Collections	Proposed Vintage 1 True Up Amount: Residential Actual NC Retail Costs Vintage 1 (85%)	Proposed Vintage 1 True Up Amount: (Over)/Under Collections
1	EE Avoided Cost Component	McManeus Exhibit 2 Pg 1	$ 41,655,470		$ 35,407,150	
2	DSM Avoided Cost Component	McManeus Exhibit 2 Pg 1	$ 9,729,588		$ 8,270,149	
3	Residential Avoided Cost Revenue Requirement	Line 1 + Line 2	$ 51,385,058		$ 43,677,299	
4	Gross Receipts Tax and Regulatory Fee Factor		1.034554		1.034554	
5	Adjusted Residential Avoided Cost Revenue Requirement	Line 3 * Line 4	$ 53,160,617		$ 45,186,524	
6	Net Lost Revenues	McManeus Exhibit 2 Pg 1	$ 7,438,541		$ 6,322,760	
7	Residential Found Revenues	Workpapers pg 13 (A8 + B8 +B9)	$ 218,812		$ 185,991	
8	Total Net Lost Revenues	Line 6 - Line 7	$ 7,219,729		$ 6,136,769	
9	Residential Save-A-Watt Revenue Requirement	Line 5 + Line 8	$ 60,380,345		$ 51,323,294	
10	Actual Residential Revenue Collected	Workpapers pg 14	$ 30,493,177		$ 30,493,177	
11	EMF	Line 9 - Line 10	$ 29,887,168	$ 29,887,168	$ 20,830,117	$ 20,830,117
12	Projected NC Residential Sales (kWh) for rate period	Duff Exhibit 1				21,006,907,773
13	**Residential V3 Rider EE (cents per kWh)**	Line 11 / Line 12				**0.0992**

			Non-Residential Actual NC Retail Costs Vintage 1	(Over)/Under Collections	Proposed Vintage 1 True Up Amount: Non-Residential Actual NC Retail Costs Vintage 1 (85%)	Proposed Vintage 1 True Up Amount: (Over)/Under Collections
1	EE Avoided Cost Component	McManeus Exhibit 2 Pg 1	$ 14,772,925		$ 12,556,986	
2	DSM Avoided Cost Component	McManeus Exhibit 2 Pg 1	$ 11,408,136		$ 9,696,915	
3	Non-Residential Avoided Cost Revenue Requirement	Line 1 + Line 2	$ 26,181,060		$ 22,253,901	
4	Gross Receipts Tax and Regulatory Fee Factor		1.034554		1.034554	
5	Adjusted Non-Residential Avoided Cost Revenue Requirement	Line 3 * Line 4	$ 27,085,721		$ 23,022,863	
6	Net Lost Revenue Vintage 1 (Year 1)[2]		$ 1,423,359		$ 1,209,855	
7	Non-Residential Found Revenues Vintage Year 1	Workpapers pg 13 (A1 + B1 +B2)	$ 1,469,092		$ 1,248,729	
8	Total Net Lost Revenues	Line 6 - Line 7	$ -		$ -	
9	Non-Residential Save-A-Watt Revenue Requirement[1]	Line 5 + Line 8	$ 27,085,721		$ 23,022,863	
10	Actual Non Residential Revenue Collected EE Programs	Workpapers pg 14	$ 7,358,334		$ 7,358,334	
11	Actual Non Residential Revenue Collected DSM Programs	Workpapers pg 14	$ 4,823,157		$ 4,823,157	
12	EMF EE		$ 7,879,321	$ 7,879,321	$ 5,593,673	$ 5,593,673
13	EMF DSM		$ 6,979,175	$ 6,979,175	$ 5,208,825	$ 5,208,825
14	Projected Vintage 1 EE Participants NC Non-Residential Sales (kWh) for rate period	Duff Exhibit 1, Duff Exhibit 5				25,687,154,849
15	Projected Vintage 1DSM Participants NC Non-Residential Sales (kWh) for rate period	Duff Exhibit 1, Duff Exhibit 5				25,440,044,161
16	**Vintage 1 EE participant Non-Residential Rider EE (cents per kWh)**	Line 12/ Line 14				**0.0218**
17	**Vintage 1 DSM participant Non-Residential Rider EE (cents per kWh)**	Line 13/ Line 15				**0.0205**

Notes:
(1) Revenue requirements are set at 85% achievement of target avoided cost savings
(2)Net Lost Revenues for Year 3 of Vintage 1 will be captured in 2011 Base Rates Case

RIDER EE (NC)
ENERGY EFFICIENCY RIDER

APPLICABILITY (North Carolina Only)
Service supplied under the Company's rate schedules is subject to approved adjustments for new energy efficiency and demand-side management programs approved by the North Carolina Utilities Commission (NCUC). The Rider Adjustments are not included in the Rate Schedules of the Company and therefore, must be applied to the bill as calculated under the applicable rate. Cost recovery under Rider EE is a four-year limited term pilot.

GENERAL PROVISIONS
This Rider will recover the cost of new energy efficiency and demand-side management programs, using the method approved by the NCUC, for programs implemented over a four-year period (*i.e*., comprising four 12-month program years or "Vintage Years"). In each year this Rider will include components to recover revenue requirements related to demand-side management and energy efficiency programs implemented in that Vintage Year, as well as net lost revenues resulting from the energy efficiency programs. Net lost revenues are revenue losses, net of both marginal costs avoided at the time of the lost kilowatt hour sale(s) and increases in revenues resulting from any activity by the Company's public utility operations that cause a customer to increase demand or energy consumption. Net lost revenues associated with each Vintage Year will be recovered for 36 months upon implementation, except that the recovery of net lost revenues will end upon implementation of new rates approved by the Commission in a general rate case or comparable proceeding to the extent that rates are set in a rate case for vintages up to that point. To recover net lost revenues for programs implemented in years 3 and 4, the Rider will continue beyond the four-year period.

Revenue requirements will be determined on a system basis and allocated to North Carolina retail customers based on the North Carolina retail contribution to system retail peak demand for demand side management programs and North Carolina retail contribution to system retail kWh sales for energy efficiency programs. Residential customer classes will pay for residential programs and non-residential customer classes will pay for non-residential programs through methods found appropriate by the Commission for demand-side management and energy efficiency programs, respectively. All allocation factors will be based on the Company's most recently completed cost of service study utilizing the allocation method approved by NCUC in the Company's most recent general rate proceeding and will exclude the amounts related to customers that elect to opt out of this Rider.

TRUE-UP PROVISIONS
Rider amounts will initially be determined based on estimated kW and kWh impacts related to expected customer participation in the programs, and will be trued-up as actual customer participation and actual kW and kWh impacts are verified. If a customer participates in any vintage of programs, the customer is subject to the true-ups as discussed in this section for any vintage of programs in which the customer participated.

Participation true-ups: After the completion of the first Vintage Year, the Rider will include a true-up of previous Rider amounts billed to reflect actual customer participation in the programs.

Measurement and verification true-up: In the sixth year a final true-up will be based on changes in participation combined with actual verified kW and kWh savings.

Earnings cap true-up: In the sixth year, a true up will adjust customer bills, if applicable, to refund with interest, amounts collected through the Rider in excess of the earnings cap, in accordance with the following levels of achievement of actual energy and peak demand reductions and allowed return on investment.

Percentage Actual Target Achievement	Return on Investment Cap on Program Costs Percentage
>=90%	15%
80% to 89%	12%
60% to 79%	9%
< 60%	5%

DETERMINATION OF ENERGY EFFICIENCY RIDER ADJUSTMENT
Energy Efficiency Adjustments (EEA) will be applied to the energy in kilowatt hours (kWh) billed of all rate schedules for each vintage as determined by the following formula, adjusted as appropriate for the time value of money:

RIDER EE (NC)
ENERGY EFFICIENCY RIDER

EEA Residential (expressed as cents per kWh) =

(Residential Avoided Cost Revenue Requirement + Residential Net Lost Revenues) / Forecasted Residential kWh Sales for the Rider billing period

Where
Residential Avoided Cost Revenue Requirement = (Residential Demand-Side Management Program Avoided Cost X 75%) + (Residential Energy Efficiency Program Avoided Cost X 50%)

EEA Non-residential (expressed as cents per kWh) =

(Non-residential Avoided Cost Revenue Requirement + Non-residential Net Lost Revenues) / Forecasted Non-residential kWh Sales for the Rider billing period

Where
Non-residential Avoided Cost Revenue Requirement = (Non-residential Demand-Side Management Program Avoided Cost X 75%) + (Non-residential Energy Efficiency Program Avoided Cost X 50%)

OPT OUT PROVISION FOR QUALIFYING NON-RESIDENTIAL CUSTOMERS

The EEA increment applicable to energy efficiency programs and/or demand-side management programs will not be applied to the energy charge of the applicable rate schedule for Customers qualified to opt out of the programs where:

a. The Customer certifies or attests to the Company that it has, or has plans for implementing alternative energy efficiency measures in accordance with quantifiable goals.
b. Electric service to the Customer must be provided under:
   1. An electric service agreement where the establishment is classified as a "manufacturing industry" by the Standard Industrial Classification Manual published by the United States Government and where more than 50% of the electric energy consumption of such establishment is used for its manufacturing processes.
   2. An electric service agreement for general service as provided for under the Company's rate schedules where the Customer's annual energy use is 1,000,000 kilowatt hours or more.

The following additional provisions apply for qualifying customers who elect to opt out:

For Customers who elect to opt out of energy efficiency programs, the following provisions also apply:

- Qualifying customers may opt out of the Company's energy efficiency programs each calendar year only during the annual two-month enrollment period between November 1 and December 31 immediately prior to a new Rider EE becoming effective on January 1. (Qualifying new customers have sixty days after beginning service to opt out).
- Customers may not opt out of individual energy efficiency programs offered by the Company. The choice to opt out applies to the Company's entire portfolio of energy efficiency programs.
- If a customer participates in any vintage of energy efficiency programs, the customer, irrespective of future opt out decisions, remains obligated to pay the remaining portion of the lost revenues for each vintage of energy efficiency programs in which the customer participated.

For Customers who elect to opt out of demand-side management programs, the following provisions also apply:

- Qualifying customers may opt out of the Company's demand-side management program during the enrollment period between November 1, and December 31immediately prior to a new Rider EE becoming effective on January 1of the applicable year. (Qualifying new customers have sixty days after beginning service to opt out).
- If a customer elects to participate in a demand-side management program, the customer may not subsequently choose to opt out of demand-side management programs for three years. Qualifying customers you have not opted out of demand-side management in the 2009 enrollment period for Rider EE effective January 1, 2010 are not eligible to opt out until the opt out period in 2012.

Any qualifying non-residential customer that has not participated in an energy efficiency or demand-side management program may opt out during any enrollment period, and have no further responsibility to pay Rider EE amounts associated with the Customer's opt out election for energy efficiency and/or demand-side management programs.

RIDER EE (NC)
ENERGY EFFICIENCY RIDER

ENERGY EFFICIENCY RIDER ADJUSTMENTS (EEA)

The EEA applicable to the residential and nonresidential rate schedules for the period January 1, 2012 through December 31, 2012 including revenue-related taxes and utility assessments are as follows:

Residential	Vintage 1, 2, 3	0.2363¢ per kWh*
Nonresidential		
Vintage 1		
	Energy Efficiency	0.0218¢ per kWh*
	Demand Side Management	0.0205¢ per kWh*
Vintage 2		
	Energy Efficiency	0.0037¢ per kWh
	Demand Side Management	NA
Vintage 3		
	Energy Efficiency	0.0406¢ per kWh
	Demand Side Management	0.0526¢ per kWh

*Does not include recovery of the third year of net lost revenues for Vintage 1. Such lost revenues will be addressed in a general rate case.

Each factor listed under Nonresidential is applicable to nonresidential customers who are not eligible to opt out and to eligible customers who have not opted out. If a nonresidential customer has opted out of a Vintage(s), then the applicable energy efficiency and/or demand-side management charge(s) shown above for the Vintage(s) during which the customer has opted out, will not apply to the bill.

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 979

In the Matter of	)	DIRECT TESTIMONY OF
Application of Duke Energy Carolinas	)	TIMOTHY DUFF
LLC for Approval of Vintage 3 Rider EE	)	FOR
	)	DUKE ENERGY CAROLINAS, LLC

I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Timothy Duff. My business address is 526 South Church Street, Charlotte, North Carolina 28202.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am General Manager, Energy Efficiency & Smart Grid Policy and Collaboration for Duke Energy Carolinas, LLC ("Duke Energy Carolinas" or the "Company").

Q. PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL QUALIFICATIONS.

A. I graduated from Michigan State University with a Bachelor of Arts in Political Economics and a Bachelor of Arts in Business Administration, and received a Master of Business Administration degree from the Stephen M. Ross School of Business at the University of Michigan. I started my career with Ford Motor Company and worked in a variety of roles within the company's financial organization, including Operations Financial Analyst and Budget Rent-A-Car Account Controller. After five years at Ford Motor Company, I started working with Cinergy in 2001, providing business and financial support to plant operating staff. Eighteen months later I joined Cinergy's Rates Department, where I provided revenue requirement analytics and general rate support for the company's transfer of three generating plants. After my time in the Rates Department, I spent a short period of time in the Environmental Strategy Department, and then I joined Cinergy's Regulatory and Legislative Strategy Department. After Cinergy merged with Duke Energy in 2006, I started a four year stint as Managing Director, Federal Regulatory Policy. In this role, I was primarily responsible for developing and advocating Duke Energy's policy positions with the Federal Energy Regulatory Commission. I assumed my current position as General Manager, Energy Efficiency & Smart Grid Policy and Collaboration in 2010.

Q. PLEASE DESCRIBE YOUR DUTIES AS GENERAL MANAGER, ENERGY EFFICIENCY & SMART GRID POLICY AND COLLABORATION FOR DUKE ENERGY CAROLINAS.

A. I am responsible for the development of strategies and policies related to energy efficiency, smart grid and all other retail services.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION OR ANY OTHER REGULATORY BODIES?

A. Yes. I testified in Duke Energy Carolinas' last application to update its demand-side management ("DSM") and energy efficiency ("EE") cost recovery rider, Rider EE, in Docket E-7, Sub 941. I also testified in support of Commission approval of the EE portfolio and the recovery mechanism for the Core Plus EE programs in Indiana Cause No. 43955.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. My testimony supports Duke Energy Carolinas' Application for approval of Rider EE for Vintage 3 ("Rider 3"), which incorporates the third vintage of the Company's DSM and EE programs, including a participation true-up for Vintage 1 programs. In particular, my testimony: (1) provides an overview of the Commission's Rule R8-69 filing requirements; (2) gives a synopsis of the EE and DSM programs included in Vintage 3; (3) discusses our results to date; and (4) presents an overview of how these results have affected the Rider 3 calculations.

Q. PLEASE DESCRIBE THE EXHIBITS ATTACHED TO YOUR TESTIMONY.

A. Duff Exhibit 1 supplies the projected retail monthly sales for the rate period. Duff Exhibit 2 contains, for each measure, the total expenses expected to be incurred during the rate period, the total costs avoided during the rate period, the expected summer and winter peak demand reductions and the expected energy reductions. Duff Exhibit 3 contains the found revenues used in the lost margin calculations. Duff Exhibit 4 provides an evaluation of event-based programs (e.g. DSM). Duff Exhibit 5 includes the Company's projected North Carolina sales for customers who opt-out of participating in EE and DSM programs. Lastly, Duff Exhibit 6 supplies an update on the EE and DSM program results, spending, and impacts.

Q. WERE DUFF EXHIBITS 1 THRU 6 PREPARED BY YOU OR AT YOUR DIRECTION AND SUPERVISION?

A. Yes, they were.

II. <u>RULE R8-69 FILING REQUIREMENTS</u>

Q. WHAT INFORMATION IS THE COMPANY PROVIDING IN RESPONSE TO THE COMMISSION'S FILING REQUIREMENTS?

A. The information for Rider 3 is provided in response to the Commission's filing requirements contained in R8-69(f)(1) and can be found in the testimony and exhibits of Company witnesses Duff, McManeus, and Ossege as follows:

R8-69(f)(1)		Items	Location in Testimony
(i)		Projected NC retail sales for the rate period	Duff Exhibit 1
(ii)		For each measure for which cost recovery is requested through Rider 3:	
(ii)	a.	Total expenses expected to be incurred during the rate period	Duff Exhibit 2

(ii)	b.	Total costs savings directly attributable to measures	Duff Exhibit 2
(ii)	c.	Evaluation, Measurement, and Verification activities for the rate period	Ossege Exhibit 1
(ii)	d.	Expected summer and winter peak demand reductions	Duff Exhibit 2
(ii)	e.	Expected energy reductions	Duff Exhibit 2
(iii)		Filing requirements for DSM/EE EMF rider, including:	
(iii)	a.	Total expenses for the test period in the aggregate and broken down by type of expenditure, unit, and jurisdiction	Duff Exhibit 3
(iii)	b.	Total avoided costs for the test period in the aggregate and broken down by type of expenditure, unit, and jurisdiction	Duff Exhibit 2
(iii)	c.	Description of results from EM&V activities	Testimony of Ashlie Ossege and Ossege Exhibits 1, 2, 3, A, B, and C
(iii)	d.	Total Summer and Winter peak demand reductions in the aggregate and broken down per program	Duff Exhibit 2
(iii)	e.	Total energy reduction in the aggregate and broken down per program	Duff Exhibit 2
(iii)	f.	Discussion of findings and results of programs	Testimony of Tim Duff and Duff Exhibit 6
(iii)	g.	Evaluations of event-based programs	Duff Exhibit 4
(iii)	h.	Comparison of impact estimates from previous year and explanation of significant differences	Testimony of Tim Duff and Duff Exhibit 6
(iv)		Determination of utility incentives	Testimony of Jane McManeus & McManeus Exhibit 1
(v)		Actual revenues from DSM/EE and DSM/EE EMF riders	McManeus Exhibit 3
(vi)		Proposed Rider 3	Testimony of Jane McManeus & McManeus Exhibit 4
(vii)		Projected NC sales for customers opting out of measures	Duff Exhibit 5
(viii)		Supporting work papers	Work Papers

III. PORTFOLIO OVERVIEW

Q. WHAT ARE DUKE ENERGY CAROLINAS' CURRENT EE AND DSM PROGRAMS?

A. The Company has two interruptible programs for non-residential customers, Interruptible Service ("IS") and Standby Generation ("SG"), which are accounted for outside of the modified save-a-watt mechanism approved by the Commission in Docket E-7, Sub 831. Aside from IS and SG, the following DSM and EE programs have been implemented by the Company in its North Carolina service territory in conjunction with the Commission's approval of the modified save-a-watt approach.

RESIDENTIAL CUSTOMER PROGRAMS

- Residential Energy Assessments
- Residential Smart $aver® Programs
- Low Income Energy Efficiency and Weatherization Assistance Program
- Energy Efficiency Education Program for Schools
- Power Manager

NON-RESIDENTIAL CUSTOMER PROGRAMS

- Non-Residential Smart $aver® Programs
- PowerShare®

Q. ARE THESE SUBSTANTIVELY THE SAME PROGRAMS DUKE ENERGY CAROLINAS RECEIVED APPROVAL FOR IN DOCKET E-7, SUB 831?

A. Yes.

Q. HAVE THERE BEEN ANY MODIFICATIONS TO THESE PROGRAMS SINCE THE COMPANY'S LAST UPDATE?

A. Yes. The Company has made minor modification to both non-residential and residential programs to increase program effectiveness. Based on market forces and customer feedback, Duke Energy Carolinas added thirty-three additional EE measures to its Non-Residential Smart $aver® Program, expanding the types of energy-efficient lighting, pumps, and motors available. The Company has also utilized a new distribution channel, property managers, to boost installation of fluorescent light bulbs ("CFLs") in its Residential Smart $aver® Program. Property managers and their tenants have traditionally been a difficult customer segment to reach for adoption of CFLs. The Company's outreach and partnership with property managers were instrumental in getting higher participation from renters and improving lighting efficiency while reducing energy consumption. Yet, this new distribution channel was not the only adjustment made to CFL-related programs based on customer feedback. After receiving feedback from participating schools, installers, and residential customers, Duke Energy Carolinas adjusted the components of EE kits as well as the number of CFLs and bulb mix offered in the Home Energy House Call program in order to boost participation. Together, these changes drove significantly higher results for CFL-related programs than the Company had originally estimated.

Q. DOES THE COMPANY EXPECT HIGHER-THAN-INITIALLY-EXPECTED RESULTS TO CONTINUE IN LIGHT OF INCREASING BUILDING CODES AND EFFICIENCY STANDARDS?

A. No. While Duke Energy Carolinas will continue to develop and offer new EE programs, the changes to building codes and efficiency standards for appliances and lighting will reduce or eliminate some of the most cost-effective EE measures from the Company's current portfolio. For example, higher efficiency lighting will become the baseline standard in 2012, which will diminish the magnitude of the role that CFLs will play in EE programs offered by the Company. The Company will need to continually add new measures, innovate in program design, and introduce new pilot programs in order to fill the performance gaps left by now-standard EE measures that are phased out due to improvements in codes and standards.

Q. YOU MENTIONED DUKE ENERGY CAROLINAS NEEDS TO CONTINUE TO INNOVATE. WHAT PILOT PROGRAMS ARE INCLUDED IN THE CURRENT PORTFOLIO OF PROGRAMS FOR RIDER 3?

A. The Company is offering three pilot programs that will provide impacts to customers in the Carolinas. The first pilot, Smart Energy Now ("SEN"), was approved by this Commission on February 14, 2011 in Docket E-7, Sub 961. SEN is a first-of-its-kind pilot program that is designed to reduce energy consumption within the commercial office space located in Charlotte City Center through community engagement leading to behavioral modification. In order to enable building managers and occupants to effectively make these behavioral modifications, they will be provided with additional energy consumption information and actionable efficiency recommendations.

Residential Retrofit is currently approved in both North Carolina and South Carolina. This pilot was approved by this Commission on January 25, 2011 in Docket E-7, Sub 952 and was approved by the Public Service Commission of South Carolina in Docket 2010-51-E on February 24, 2010. This pilot program offers residential customers an assessment of their home's efficiency. Based on the assessment, the Company will then provide these customers with incentives to retrofit their home with new energy efficiency measures that were identified in the initial audit.

Home Energy Comparison Report ("HECR"), on the other hand, is currently only being piloted in South Carolina. HECR was approved by the Public Service Commission of South Carolina in Docket 2010-50-E on March 24, 2010. HECR provides enrolled residential customers with monthly or quarterly reports that contrast their energy usage over time with the energy usage of nearby "average" and "efficient" homes (based on similarities of location, size, home age, and number of occupants). All of these pilot programs, regardless of the state(s) they operate in, generate avoided cost benefits for customers throughout the Duke Energy Carolinas system.

Q. HOW WILL THE REVENUE REQUIREMENTS FROM THESE PROGRAMS BE ACCOUNTED FOR IN RIDER 3?

A. The Company will incorporate estimates of net lost revenues for North Carolina from the SEN pilot in its third vintage of programs in the Rider 3 calculation. The North Carolina pilot of Residential Retrofit will be treated similarly to SEN with respect to having estimates of net lost revenues incorporated. However, it will also include the allocated avoided costs being captured in the calculation of Rider 3. HECR and the South Carolina pilot of Residential Retrofit were approved in South Carolina after the Company's Vintage 1 programs were launched in North Carolina. Because the Duke Energy Carolinas system is planned, designed, and operated on an integrated basis, avoided cost benefits from these two pilots will be allocated to customers in both North and South Carolina and incorporated in the Vintage 1 participation true-up, or Experience Modification Factor ("EMF"). Unlike avoided costs, however, net lost revenues are determined on a state and class-specific basis. Thus, net lost revenues from HECR and the South Carolina pilot of Residential Retrofit are not included in Rider 3 and will not be included in the EMF.

Q. ARE THERE ANY OTHER SOUTH CAROLINA-SPECIFIC PROGRAMS THAT MIGHT PROVIDE ALLOCATED AVOIDED COST BENEFITS TO NORTH CAROLINA CUSTOMERS?

Yes. Duke Energy Carolinas began offering the PowerShare® Call Option after it was approved by the Public Service Commission of South Carolina approved in Docket 2010-E-52 on April 21, 2010. However, this DSM program has generated avoided cost benefits for customers in both North and South Carolina by providing customers with payments for voluntarily reducing load when it is economical to shed or shift consumption.

Q. HOW WILL THE REVENUE REQUIREMENT FROM POWERSHARE® CALL OPTION BE ACCOUNTED FOR IN THIS VINTAGE RIDER?

A. DSM programs do not generate appreciable net lost revenues because they only shift energy consumption to future hours rather than eliminate energy consumption as EE programs do. Thus, no net lost revenues are considered in the Rider calculations. Avoided cost benefits, on the other hand, from PowerShare® Call Option benefit customers in both North and South Carolina and will be allocated in the Rider 3 calculation as well as the Vintage 1 EMF.

IV. <u>EE AND DSM PROGRAM RESULTS TO DATE</u>

Q. HOW MUCH ENERGY AND CAPACITY AND AVOIDED COSTS HAVE BEEN SAVED FROM THESE PROGRAMS?

A. Since receiving approval for modified save-a-watt, the Company through its EE and DSM programs has generated over 625 GWh of energy reductions and over 735 MW of capacity reductions. Of these reductions, 577 GWh of energy reductions and about 563 MW of capacity reductions apply towards the Company's achievement targets established under modified save-a-watt. These programs have also generated roughly $210 million in avoided cost benefits for Duke Energy Carolinas' customers.

Q. HOW DO THESE RESULTS COMPARE WITH THE PERFORMANCE TARGETS SHOWN IN EXHIBIT B OF THE SETTLEMENT AGREEMENT IN DOCKET E-7, SUB 831?

A. Actual avoided cost benefits generated by these programs are more than twice the target to achieve shown in the Company's Settlement Agreement in Docket E-7, Sub 831. Similarly, capacity impacts are more than 150% of the original target, and energy impacts are almost 250% of the original target. However, the Company understands the economy, which affects customer income available for efficiency upgrades, and changing codes and standards may greatly affect Duke Energy Carolinas' ability to meet or exceed future targets. In fact, while the positive EE results to date have primarily been driven by lighting measures for both residential and non-residential customers, changing lighting standards may likely limit the Company's ability to achieve similar results in the future.

Q. HAVE ANY PROGRAMS SIGNIFICANTLY OUT-PERFORMED RELATIVE TO THEIR ORIGINAL ESTIMATES?

A. Yes. As previously mentioned, lighting measures included in the Residential Smart $aver® Program and the Non-Residential Smart $aver® Program have been adopted at much higher rates than originally anticipated.

Q. HAVE ANY PROGRAMS SIGNIFICANTLY UNDER-PERFORMED RELATIVE TO THEIR ORIGINAL ESTIMATES?

A. Yes. Both the Low Income Energy Efficiency and Weatherization Assistance Program and the Energy Efficiency Education Program for Schools have under-performed relative to their original targets. These programs, however, have different rationales behind their lack of results. For example, stimulus-related funding provided by the federal government in 2009 and 2010 has supplanted the Company's original program objectives. As stimulus funding runs out, Duke Energy Carolinas expects its Low Income Energy Efficiency and Weatherization Assistance Program to ramp back up.

On the other hand, the Energy Efficiency Education Program for Schools has undergone several enhancements to improve its visibility among educators and to generate additional teacher and student family adoption. While the program has been recognized for its innovation from multiple organizations, the Company and its partner, Scholastic, continue to refine this program in order to achieve greater results.

Q. HOW WILL THE COMPANY'S EARLY SUCCESS IMPACT THE PORTFOLIO OF EE AND DSM PROGRAMS IN THE FUTURE?

A. While the Company has had several early successes with some of its programs, achievement of future EE benefits remains cloudy. Issues such as customer opt-out, the economy, and changes in codes and standards can greatly affect future performance of programs. In recognition of these uncertainties, the Company has decided for Rider 3 to calculate the EMF portion at 85% of the revenue requirement. This allows the Company to smooth out potential future rate adjustments in light of uncertainty about future performance while recognizing greater participation results from Vintage 1 still remain to be collected.

V. RIDER IMPACTS

Q. HAVE THE PARTICIPATION RESULTS AFFECTED THE VINTAGE 1 EXPERIENCE MODIFICATION FACTOR?

A. Yes. The EMF in Rider 3 accounts for changes to actual participation relative to the forecasted participation levels utilized in the Company's Vintage 1 Rider. As the Company receives actual participation information, Duke Energy Carolinas is able to update participation-driven actual avoided cost benefits and the net lost revenues derived from its EE and DSM programs. For example, the Low Income Energy Efficiency and Weatherization Assistance Program and the Energy Efficiency Education Program for Schools have underperformed relative to their original participation targets. As such, their portions of the EMF will be reduced to reflect lower-than-anticipated participation. On the other hand, the Company saw higher-than-expected participation from residential and non-residential programs that included lighting-related measures, Residential Energy Assessments, and PowerShare.® These results will also be included in the Vintage 1 EMF to reflect actual participation.

Q. HOW DOES EM&V DIFFER FROM PARTICIPATION?

A. As further explained in Witness Ossege's testimony, Evaluation, Measurement, and Verification ("EM&V") is a comprehensive assessment and data collection methodology utilized by the Company to determine the achieved load reductions, actual free ridership, and the effectiveness of program design for each measure or program. EM&V results will be applied prospectively as they become available in the Rider 3 calculation. Participation results, on the other hand, are applied as actual results in the calculation of the Vintage 1 EMF.

Q. HOW WILL EM&V BE INCORPORATED INTO THE VINTAGE 3 COMPONENT OF RIDER 3?

A. To date, the Company has received completed EM&V studies on residential and non-residential lighting measures. These measures currently provide significant results within the Company's portfolio of EE programs. Thus, Duke Energy Carolinas filed a motion for an extension of time so the Company could incorporate residential CFL and non-residential lighting-related EM&V results into the prospective Vintage 3 component of Rider 3. This allows the Company to recognize load impact adjustments from CFL-related lighting programs in order to avoid large true-ups in future vintages.

Q. PLEASE DESCRIBE HOW FOUND REVENUES WERE CALCULATED.

A. Consistent with the "Decision Tree" found in Appendix A of the Commission's February 8, 2011 order in Docket E-7, Sub 831, possible found revenue activities were identified, categorized, and netted against the net lost revenues created by the Company's EE programs. Found revenues may result from activities that directly or indirectly result in an increase in customer demand or energy consumption within Duke Energy Carolinas' service territory. However, load-building activities such as these would not be considered found revenues per se if they (1) would have occurred regardless of the Company's activity, (2) were a result of a Commission-approved economic development activity not determined to produce found revenues, or (3) were part of an unsolicited request for Duke Energy Carolinas to engage in an activity that supports efforts to grow the economy. On the other hand, found revenues would occur for load growth that did not fall into the previous categories but was a directly or indirectly a result of Duke Energy Carolinas' activities. Based on the results of this work, all potential found revenue-related activities are identified and categorized in the work papers.

Q. HAS THE OPT-OUT OF NON-RESIDENTIAL CUSTOMERS AFFECTED THE RESULTS FROM THE PORTFOLIO OF APPROVED PROGRAMS?

A. Yes, the opt-out of qualifying non-residential customers from participating in the Company's programs has had a negative effect on Duke Energy Carolina's overall non-residential impacts. For Vintage 1, the Company had 847 eligible customer accounts opt out of participating in Duke Energy Carolina's non-residential portfolio of EE programs. While this represents only slightly over 8% of eligible customer accounts, these same customer accounts represent nearly 38% of the load for all eligible customers. Essentially, this means that Duke Energy Carolinas can only deliver the efficiency benefits associated with its non-residential programs to less than 2/3 of its opt-out eligible non-residential customers.

Q. WHAT HAS THE COMPANY DONE TO ENCOURAGE NON-RESIDENTIAL CUSTOMERS TO OPT-IN TO ITS PROGRAMS?

A. Duke Energy Carolinas has responded to customer feedback on its existing programs, adding new efficiency measures. Additionally, the Company has worked to educate vendors, trade-allies, and suppliers to help them incorporate incentives from EE programs into their offers for customers. The Company has also improved its outreach activities, using its account managers, website portal, email, and traditional mail to notify customers of energy-saving opportunities. Lastly, the Company has developed the SEN pilot program, which is targeted specifically at engaging non-residential customers in a community effort, in order to help customers better manage their energy consumption.

V. CONCLUSION

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes.

Duke Energy Carolinas
DSM/EE Cost Recovery Rider 3
Docket Number E-7 Sub 979
Forecasted kWh Sales for Rate Period

Class	Type	Jan_12	Feb_12	Mar_12	Apr_12	May_12	Jun_12	Jul_12	Aug_12	Sep_12	Oct_12	Nov_12	Dec_12	2012
Sales Forecast - kWhs														
North Carolina:														
Residential	kWh	2,235,096,794	2,011,438,463	1,669,193,873	1,441,195,604	1,335,438,757	1,638,280,895	2,005,777,313	2,110,653,039	1,932,207,501	1,358,382,747	1,375,030,538	1,894,212,248	21,006,907,773
General	kWh	1,766,560,912	1,709,737,359	1,614,887,340	1,668,301,257	1,711,569,198	1,919,670,198	2,033,575,027	2,103,479,460	2,071,700,661	1,789,818,291	1,657,264,844	1,711,707,238	21,758,271,785
Industrial	kWh	694,749,828	760,004,480	712,935,388	755,968,900	774,531,791	818,973,463	813,376,237	852,818,321	849,128,744	782,825,676	750,790,861	736,442,786	9,302,546,475
Textile	kWh	190,811,822	227,317,007	215,171,504	218,879,527	231,730,090	237,454,231	213,362,614	259,651,931	239,451,833	207,494,554	231,543,364	200,313,943	2,673,182,418
Other	kWh	21,146,037	20,863,565	20,838,719	20,894,493	20,875,891	21,155,966	20,770,782	21,363,459	21,046,894	20,031,893	21,897,199	21,132,544	252,017,442
Total	kWh	4,908,365,393	4,729,360,874	4,233,026,824	4,105,239,781	4,074,145,728	4,635,534,752	5,086,861,973	5,347,966,209	5,113,535,633	4,158,553,161	4,036,526,805	4,563,808,758	54,992,925,893

Duke Energy Carolinas
DSM/EE Cost Recovery Vintage 1 True Up June 1, 2009 - December 31, 2009
Docket Number E-7 Sub 979
Load Impact, Costs and Net Lost Revenues by Program

				A	B	C		D	E
								NC Residential Avoided Costs	NC Residential Lost Revenues
		System kW - Summer Peak	Energy Reduction	System Avoided Costs 50%	NC Allocation Factor Allocation based on kWh sales 2009 COS Study	NC Allocation Factor 2009 COS Study			
	Residential Programs								
1	**Residential Energy Assessments**	1,281	11,947,026	$ 1,348,942	0.730077318		A1 * B1	$ 984,832	$ 61,123
2	**Smart Saver® for Residential Customers**	1,533	14,683,905	$ 2,001,787	0.730077318		A2 * B2	$ 1,461,459	$ 103,375
3	**Low Income Energy Efficiency and Weatherization Assistance**	166	1,785,051	$ 182,695	0.730077318		A3 * B3	$ 133,381	$ 10,354
4	**Energy Efficiency Education Program for Schools**	160	860,105	$ 118,977	0.730077318		A4 * B4	$ 86,862	$ 2,777
	Total for Residential Conservation Programs	3,140	29,276,087	$ 3,652,401				$ 2,666,535	$ 177,629
				75%	Allocation based on Peak Demand	Allocation Residential vs. Non-Residential Peak Demand			
5	**Power Manager**	57,682	-	$ 3,095,374	0.738190005	0.459245801	(A5 + A12) * B5 * C5	$ 1,582,582	$ -
	Total Residential	60,822	29,276,087	$ 6,747,775				$ 4,249,117	$ 177,629
								NC Non-Residential Avoided Costs	NC Non-Residential Lost Revenues
		System kW - Summer Peak	Energy Reduction	System Avoided Costs 50%	NC Allocation Factor Allocation based on kWh sales 2009 COS Study	2009 COS Study			
	Non-Residential Programs								
6	**Smart Saver® for Non-Residential Customers Lighting**	4,498	17,355,342	$ 3,163,598	0.730077318		A6 * B6	$ 2,309,671	$ 159,861
7	**Smart Saver® for Non-Residential Customers Motors**	148	774,430	$ 225,641	0.730077318		A7 * B7	$ 164,735	$ 2,348
8	**Smart Saver® for Non-Residential Customers - Other Prescriptive**			$ -	0.730077318		A8 * B8	$ -	$ -
9	**Smart Saver® for Non-Residential Customers - Energy Star Foc**	53	294,349	$ 76,689	0.730077318		A9 * B9	$ 55,989	$ 1,453
10	**Smart Saver® for Non-Residential Customers - HVAC**	263	743,630	$ 291,570	0.730077318		A10 * B10	$ 212,869	$ 3,264
11	**Smart Saver® for Non-Residential Customers - Custom Rebate**	19	239,056	$ 30,801	0.730077318		A11 * B11	$ 22,487	$ 157
	Total for Non-Residential Conservation Programs	4,981	19,406,807	$ 3,788,299				$ 2,765,751	$ 167,083
				75%	Allocation based on Peak Demand	Allocation Residential vs. Non-Residential Peak Demand			
12	**Power Share**	110,736	-	$ 1,572,862	0.738190005	0.540754199	(A5 + A12) * B12 * C12	$ 1,863,463	$ -
	Total Non-Residential	115,717	19,406,807	$ 5,361,161				$ 4,629,215	$ 167,083

Duke Energy Carolinas
DSM/EE Cost Recovery Vintage 1 True Up January 1, 2010 - December 31, 2010
Docket Number E-7 Sub 979
Load Impact, Costs and Net Lost Revenues by Program

				A	B	C		D	E
	Residential Programs	System kW - Summer Peak	Energy Reduction	System Avoided Costs 50%	NC Allocation Factor Allocation based on kWh sales 2010 COS Study	NC Allocation Factor 2010 COS Study		NC Residential Avoided Costs	NC Residential Lost Revenues
1	**Residential Energy Assessments**	1,867	15,684,653	$ 1,906,436	0.727072718		A1 * B1	$ 1,386,118	$ 946,992
2	**Home Energy Comparison Report**	555	2,991,111	$ 85,827	0.727072718		A2 * B2	$ 62,402	
3	**Smart Saver® for Residential Customers**	43,999	466,455,566	$ 49,879,078	0.727072718		A3 * B3	$ 36,265,717	$ 5,932,813
4	**Low Income Energy Efficiency and Weatherization Assistance**	692	7,461,298	$ 763,656	0.727072718		A4 * B4	$ 555,233	$ 234,609
5	**Energy Efficiency Education Program for Schools**	1,327	7,153,414	$ 989,536	0.727072718		A5 * B5	$ 719,465	$ 146,498
5	**Total for Residential Conservation Programs**	48,440	499,746,042	$ 53,624,533				$ 38,988,935	$ 7,260,912
				75%	Allocation based on Peak Demand	Allocation Residential vs. Non-Residential Peak Demand			
6	**Power Manager**	231,882	-	$ 12,441,995	0.747893638	0.460499320	(A6 + A13) * B6 * B6	$ 8,147,006	$ -
	Total Residential	280,322	499,746,042	$ 66,066,528				$ 47,135,941	$ 7,260,912

	Non-Residential Programs	System kW - Summer Peak	Energy Reduction	System Avoided Costs 50%	NC Allocation Factor Allocation based on kWh sales 2010 COS Study	2010 COS Study		NC Non-Residential Avoided Costs	NC Non-Residential Lost Revenues
7	**Smart Saver® for Non-Residential Customers Lighting**	11,915	48,185,867	$ 9,968,766	0.727072718		A7 * B7	$ 7,248,018	$ 1,025,316
8	**Smart Saver® for Non-Residential Customers Motors**	641	3,359,203	$ 979,086	0.727072718		A8 * B8	$ 711,867	$ 52,026
9	**Smart Saver® for Non-Residential Customers - Other Prescripti**	-	434	$ 50	0.727072718		A9 * B9	$ 36	$ 5
10	**Smart Saver® for Non-Residential Customers - Energy Star Foo**	173	888,846	$ 217,727	0.727072718		A10 * B10	$ 158,303	$ 19,606
11	**Smart Saver® for Non-Residential Customers - HVAC**	1,737	4,185,991	$ 1,854,712	0.727072718		A11 * B11	$ 1,348,510	$ 53,557
12	**Smart Saver® for Non-Residential Customers - Custom Rebate**	2,596	20,892,129	$ 3,494,064	0.727072718		A12 * B12	$ 2,540,439	$ 105,766
	Total for Non-Residential Conservation Programs	17,062	77,512,470	$ 16,514,405				$ 12,007,173	$ 1,256,276
				75%	Allocation based on Peak Demand	Allocation Residential vs. Non-Residential Peak Demand			
13	**Power Share**	264,933	-	$ 11,213,345	0.747893638	0.539500680	(A6 + A13) * B13 * B13	$ 9,544,672	$ -
	Total Non-Residential	281,995	77,512,470	$ 27,727,750				$ 21,551,846	$ 1,256,276

Duke Energy Carolinas
DSM/EE Cost Recovery Vintage 3 Estimate January 1, 2012 - December 31, 2012
Docket Number E-7 Sub 979
Load Impact, Costs and Net Lost Revenues by Program

		System kW - Summer Peak	Energy Reduction	A System Program Costs	B System Avoided Costs 50%	C System Lost Revenues Net of Variable O&M	D NC Allocation Factor Allocation based on kWh sales Exhibit 2	E NC Allocation Factor Exhibit 2		NC Residential Program Costs		NC Residential Avoided Costs		NC Residential Lost Revenues
	Residential Programs													
1	**Residential Energy Assessments**	1,158	7,711,468	$ 2,524,453	$ 1,291,390	$ 565,928	0.727072718		A1 * D1	$ 1,835,461	B1 * D1	$ 938,934	C1 * D1	$ 411,471
2	**Home Energy Comparison Report**		37,897,145	$ 1,668,295	$ 1,034,860		0.727072718		A2 * D2	$ 1,212,972	B2 * D2	$ 752,418	C2 * D2	$ -
3	**Home Retrofit**	938	2,332,800	$ 1,561,772	$ 857,643	$ 58,574	0.727072718		A3 * D3	$ 1,135,522	B3 * D3	$ 623,569	C3 * D3	$ 42,588
4	**Smart Saver® for Residential Customers**	8,057	71,843,937	$ 7,802,694	$ 8,915,573	$ 14,317,969	0.727072718		A4 * D4	$ 5,673,126	B4 * D4	$ 6,482,270	C4 * D4	$ 10,410,205
5	**Low Income Energy Efficiency and Weatherization Assistance**	58	447,655	$ 1,090,868	$ 143,664	$ 11,240	0.727072718		A5 * D5	$ 793,140	B5 * D5	$ 104,454	C5 * D5	$ 8,172
6	**Energy Efficiency Education Program for Schools**	1,179	6,353,960	$ 1,504,607	$ 795,211	$ 454,989	0.727072718		A6 * D6	$ 1,093,959	B6 * D6	$ 578,176	C6 * D6	$ 330,810
	Total for Residential Conservation Programs			$ 16,152,689	$ 13,038,341	$ 15,408,700				$ 11,744,179		$ 9,479,822		$ 11,203,245
							Allocation based on Peak Demand	Allocation Residential vs. Non-Residential Peak Demand						
7	**Power Manager**	333,879		$ 17,056,983	$ 18,805,413		0.747893638	0.460499320	(A7 +A14) *D7 *E7	$ 11,862,749	(B7 +B14) *D7 *E7	$ 12,697,458		
	Total Residential			$ 33,209,672	$ 31,843,754					$ 23,606,928		$ 22,177,280		

		System kW - Summer Peak	Energy Reduction	System Program Costs*	System Avoided Costs 55%	System Lost Revenues Net of Variable O&M	NC Allocation Factor Allocation based on kWh sales Exhibit 2	Exhibit 2		NC Non-Residential Program Costs		NC Non-Residential Avoided Costs		NC Non-Residential Lost Revenues
	Non-Residential Programs													
8	**Smart Saver® for Non-Residential Customers Lighting**		43,011,995	$ 3,984,018	$ 9,295,685	$ 2,208,531	0.727072718		A8 * D8	$ 2,896,671	B8 * D8	$ 6,758,639	C8 * D8	$ 1,605,763
9	**Smart Saver® for Non-Residential Customers Motors**		2,698,447	$ 167,117	$ 634,041	$ 94,989	0.727072718		A9 * D9	$ 121,506	B9 * D9	$ 460,994	C9 * D9	$ 69,064
10	**Smart Saver® for Non-Residential Customers - Other Prescriptive**	3	15,945	$ 451	$ 1,875	$ 566	0.727072718		A10 * D10	$ 328	B10 * D10	$ 1,363	C10 * D10	$ 412
11	**Smart Saver® for Non-Residential Customers - Energy Star Food Service Products**		757,990	$ 80,796	$ 215,452	$ 24,304	0.727072718		A11 * D11	$ 58,745	B11 * D11	$ 156,649	C11 * D11	$ 17,671
12	**Smart Saver® for Non-Residential Customers - HVAC**	1,398	4,745,056	$ 603,058	$ 1,732,053	$ 149,484	0.727072718		A12 * D12	$ 438,467	B12 * D12	$ 1,259,328	C12 * D12	$ 108,685
13	**Smart Saver® for Non-Residential Customers - Custom Rebate**	2,799	17,565,577	$ 1,754,160	$ 4,402,665	$ 577,893	0.727072718		A13 * D13	$ 1,275,402	B13 * D13	$ 3,201,058	C13 * D13	$ 420,170
14	**Smart Energy Now**	-	-	$ -	$ -	$ 1,059,885				$ -		$ -		$ 1,059,885
	Total for Non-Residential Conservation Programs			$ 6,589,600	$ 16,281,771	$ 4,115,652				$ 4,791,118		$ 11,838,031		$ 3,281,650
							Allocation based on Peak Demand	Allocation Residential vs. Non-Residential Peak Demand						
14	**Power Share**	320,688		$ 17,387,248	$ 18,062,449		0.747893638	0.539500680	(A7 +A14) *D14 *E14	$ 13,897,873	(B7 +B14) *D7 *E7	$ 14,875,781		
	Total Non-Residential			$ 23,976,848	$ 34,344,220					$ 18,688,991		$ 26,713,813		

***The estimated program costs do not include non-residential energy assesments costs. The approximate costs are $1.6 million at a system level or $1.2 million allocated to North Carolina**

Duke Energy Carolinas
DSM/EE Cost Recovery Vintage 1 True Up June 1, 2009 - December 31, 2010
Docket Number E-7 Sub 979
Actual Program Costs

	System Costs 6/1/2009 - 12/31/2009	NC 2009 Allocation Factor	2009 NC Allocated Costs	**Residential**	**Non-Residential**	System Costs 12 Months Ended 12/31/2010	NC Allocation Factor 2010	2010 NC Allocated Costs	**Residential**	**Non-Residential**
Residential Energy Assessments										
Home Energy House Call	936,833					1,771,531				
Online Home Energy Calculator	230,265					121,908				
Personalized Home Energy Rpt	586,314					342,833				
Personalized Home Energy Rpt R&D						46,621				
Renewables R&D	6,621									
Home Energy Comparison Report						17,490				
House Call Plus Research						112,473				
Subtotal Res Energy Assessments	1,760,033	73.01%	1,284,960	1,284,960		2,412,856	72.71%	1,754,322	1,754,322	
Residential Smart Saver										
Residential CFL Rebate	947,358					18,063,946				
Residential CFL - Prop Mgr						196,420				
Smart $aver - Air Conditioners	444,937					1,723,661				
Smart $aver - Heat Pumps	926,478					3,818,806				
Energy Star New Home						1,848				
Subtotal Res Smart Saver	2,318,773	73.01%	1,692,884	1,692,884		23,804,681	72.71%	17,307,734	17,307,734	
Low Income Services										
Low Income CFL/Kit	78,731					324,653				
Refridgerator Replacement	3,754					20,007				
Weatherization - Electric	11,100					18,914				
Subtotal Low Income	93,585	73.01%		-		363,574	72.71%	264,345	264,345	
Energy Efficiency Education										
K12 CFL/Kit	1,876,941					2,083,984				
K12 Curriculum	1,044					-				
Subtotal EE Education	1,877,985	73.01%	1,371,074	1,371,074		2,083,984	72.71%	1,515,208	1,515,208	
Nonresidential Energy Assessments										
Non-Res Energy Assess On-Site	90,335					222,634				
Non-Res Energy Assess Tele	51,827					97,308				
Non-Res Energy Assess Tele R&D						438,900				
Comm Cust Optimization						259,273				
Subtotal Nonres Energy Assessments	142,162	73.01%	103,789		103,789	1,018,115	72.71%	740,244		740,244
Nonresidential Smart Saver										
Smart Savr Non-Res Cust Incent	98,229					1,596,104				
Smart Savr Nor-Res Cust Prescr	1,184,286					3,569,432				
Smart Savr Nor-Res Prescr MM	326,170					1,239,386				
Subtotal Nonres Smart Saver	1,608,685	73.01%	1,174,464		1,174,464	6,404,922	72.71%	4,656,844		4,656,844
Overheads for energy efficiency programs	983,411	73.01%	717,966	329,723	388,243	3,772,626	72.71%	2,742,973	1,263,137	1,479,836
Power Manager	2,040,642					8,635,634				
Power Share	666,971					7,321,990				
Overheads for demand side mgt programs	522,832					1,219,874				
Subtotal DSM Programs	3,230,445	73.82%	2,384,682	1,095,155	1,289,527	17,177,498	74.79%	12,846,941	5,916,008	6,930,934
Total Energy Efficiency & Demand Side Progran	**12,015,079**		**8,729,820**	**5,773,796**	**2,956,024**	**57,038,256**		**41,828,611**	**28,020,754**	**13,807,857**

Duke Energy Carolinas
System Event Based Demand Response June 1, 2009 - December 31, 2009
Docket Number E-7 Sub 979

Date	*State*	*Program Name*	*Event Trigger*	*High Temperature*	*Customer Notified*	*Customers Enrolled*	*MW Reduction*
6/14/2010	NC and SC	PowerManager	High Prices	95	N/A	67,206	49.8
6/15/2010	NC and SC	PowerShare Voluntary	High Prices	95	72	72	12.6
6/15/2011	NC and SC	Power Manager	High Prices		N/A	97,046	44.6
6/23/2010	NC and SC	PowerShare Voluntary	High Prices	99	72	72	
6/23/2010	NC and SC	Power Manager	High Prices		N/A	164,252	102.2
7/7/2010	NC and SC	PowerShare CallOption	High Prices		1	1	0.2
7/7/2010	NC and SC	PowerShare Voluntary	High Prices	98	73	73	9.0
7/7/2010	NC and SC	Power Manager	High Prices		N/A	147,862	80.9
7/8/2010	NC and SC	PowerShare CallOption	High Prices		1	1	0.2
7/8/2010	NC and SC	PowerShare Voluntary	High Prices	100	74	74	7.1
7/8/2010	NC and SC	Power Manager	High Prices		N/A	147,862	86.9
				97			
7/22/2010	NC and SC	Power Manager	High Prices		N/A	164,162	103.0
7/23/2010	NC and SC	PowerShare Voluntary	High Prices	98	74	74	6.5
7/23/2010	NC and SC	Power Manager	High Prices		N/A	164,162	114.0
7/29/2010	NC and SC	PowerShare Voluntary	High Prices	99	74	74	27.7
8/4/2010	NC and SC	PowerShare Voluntary	High Prices	97	78	78	5.1
8/5/2010	NC and SC	PowerShare CallOption	High Prices		1	1	0.2
8/5/2010	NC and SC	PowerShare Voluntary	High Prices	99	78	78	6.5
8/5/2010	NC and SC	Power Manager	High Prices		N/A	164,162	107.5
12/14/2010	NC and SC	PowerShare CallOption	High Prices	16	1	1	0.2
12/15/2010	NC and SC	PowerShare CallOption	High Prices		1	1	0.2
12/15/2010	NC and SC	PowerShare Voluntary	High Prices	15	89	89	9.6

Note:
The Loss factor has been included in the MW values.
For the Winter Events, the low temperature is used instead of the high temperature.
The values for MW reduction are based on the average across the hours of the event.
The MW reduction values for 12/14/2010 and 12/15/2010 are estimated.

Duke Energy Carolinas
Docket Number E-7 Sub 979
Vintage 1 and Vintage 2 Opt Out Results

Sum of 2010 kWh Usage	NC
DSM YR2(01/01/11-12/31/11) RIDER OPT-OUT	9,111,517,024
EE YR2 (01/01/11-12/31/11) RIDER OPT-OUT	8,170,016,347
DSM YR1(09/01/10-12/31/10) RIDER OPT-OUT	8,545,973,959
EE YR1 (09/01/10-12/31/10) RIDER OPT-OUT	8,298,863,271

Energy Efficiency Education Program for Schools

A. Description

The K12 Energy Efficiency Education program is an energy conservation program available in North Carolina and South Carolina. The program currently focuses on third and fourth grade students with select schools participating in a pilot for kindergarten and first grade. The program educates students on energy efficiency in homes and schools through innovative lessons based upon science and math related curriculum. Education materials focus on concepts, such as renewable fuels and energy conservation and include interactive activities, such as online home audits that engage families in the learning experience. Students may also assist in such assignments as conducting energy assessments of their schools.

Duke Energy partnered with Scholastic to develop the curriculum and to promote and deliver the program to schools, teachers and families. Scholastic employs other third party vendors to assist in data and customer service management operations.

Audience

Eligible participants are residential customers that have students enrolled in K12 public and private schools and reside in households served by Duke Energy Carolinas. Each eligible student who completes a home energy survey will receive energy efficiency measures in an energy efficiency starter kit. Similarly through student and family participation, students' classrooms are eligible to receive additional educational incentives such as school science lab kits or science books.

B & C. Impacts, Participants and Expenses

$ in millions	Filed (Annual)	Vintage 1	% of Target
NC Nominal Avoided Cost	$13.7	$2.4	18%
Program Cost	$4.0	$2.1	53%
Energy Impact kW	8,138	1327	16%
Energy Impact kWh	50,547,245	7,153,414	14%
Units		22,822	

Variance

The K12 Energy Efficiency Program incurred significant start up costs that covered initial curriculum development and printing and distribution of materials, as well as the hiring of field personnel and general marketing and outreach. Due to circumstances such as delayed regulatory approvals for Duke Energy Carolinas, longer than anticipated adoption among schools, overall lower than expected participation and slow distribution of energy measures into the home, the programs impacts were not able to positively offset expenditures.

The negative variance versus our budgeted levels of participation and impacts are a result of low participation and distribution of energy measures. One contributing factor to the programs underachievement was the channel acquisition process that requires the engagement of multiple audiences for program adoption. Despite positive feedback from teachers and focus groups, e.g. school administrators, teachers, families and students, the program struggled to effectively make it through the multilevel engagements required for success. However, as a result of extensive outreach and marketing efforts, several school districts are starting to adopt the program for district wide implementation, which should yield higher participation rates.

Energy Efficiency Education Program for Schools

D. Qualitative Analysis

Highlights

One of the most important attributes to our success is the multi-level engagement concept of the program. The program offers free educational resources to classrooms that benefit teachers, schools, students and families complete with incentive offerings at varying levels of participation. Both the relevance of the materials supporting state academic standards and ease of curriculum delivery makes it an attractive program for teachers to implement. Furthermore, parents can participate in their student's learning efforts through completing a home energy survey that provides tangible information to help families manage their energy usage. Another very important highlight of the program is the ability for Duke Energy to track, at the household level, impacts achieved from energy measures distributed into homes through data obtained from the home energy questionnaire found in the Energy Efficiency Starter Kits. Since January 2010 through December 2010, we have over 11,411 families to participate in the program in the Carolinas.

As a result of the innovative approach to bringing energy efficiency education to schools, the program was recognized by the Association of Energy Service Professionals 2009 Spring Implementation Conference: The Secrets to Successful Energy Efficiency Program Implementation. E-Source also recognized Duke Energy for the development and implementation of this program as well.

Issues

Program challenges stem around customer acquisition through the school channel. Effective implementation requires multiple audience engagement, e.g. administrators, teachers, students and parents. Depending upon different directives and priorities from school administrators, curriculum flexibility among teachers to incorporate an optional program, student enthusiasm and awareness and buy-in from parents to complete the home energy surveys with their children, it can be challenging to get immediate adoption.

Other challenges involving program adoption included program components like

- The home energy survey. Feedback has suggested that families may not be as comfortable completing the survey due to its length and types of information required, such as an account number or last 4 digits of the account holder's social security number. The information requested was patterned from existing programs that had a survey component and required capturing similar customer data for market research and fulfillment purposes. However, the survey was perceived differently in the school channel. The survey was revised, eliminating the last 4 digits of the account holder's social security number, along with reducing the number of survey questions from 30 to 6. Thus far, the survey has slightly increased in volume beginning in October 2010.

- Rebranding the program during the initial launch due to issues surfacing under the original name. Therefore, as of June 2010, the program was re-launched under a newly trademarked name, "Power in Energy."

- District adoption requires establishing relationships with varying levels of the education community and ensuring there is buy-in and awareness of the program's offering before teachers can implement it. This type of networking and engagement take time to build. A top-down approach will maximize outreach.

Energy Efficiency Education Program for Schools

Potential Changes

The program is undergoing several enhancements to improve visibility in the school market place and generate greater teacher and family adoption. Those enhancements could include

- Revising both (Duke Energy and Scholastic) supplemental Web sites, banner ads and creating blogs for teacher postings.
- Offering more teacher trainings (online, in-person).
- Modifying participant incentives.
- Implementing a robust marketing partnership with community organizations.
- Leveraging and building upon field coordinators' educator/administrator networks for stronger marketing and promotion.
- Building an online reporting tool identifying county, district, school and teacher adoption rates. This tool will also hold household customer data, as well as those that may be disqualified for any reason.

E. Marketing Strategy

This program is promoted by primarily Scholastic with Duke Energy involvement. Scholastic develops educational materials and direct mails the education kits to teachers within the targeted K12 grades of schools served within the Duke Energy Carolinas territory. The education materials are complete with all the necessary resources to immediately use for a full class. Additional marketing channels used include Web sites with educational links, games, contact information, state field coordinators for in-person training and program demonstrations, program pamphlets, brochures, trinket items and family take home materials.

The strategy for this program is to provide energy education to students attending a K12 Duke Energy school in North Carolina or South Carolina and to encourage installation energy efficiency measures in customer homes. Key components include:

- Improving Web sites and curriculum materials.
- Simplifying the survey component.
- Adding Banner and Multi-media ads.
- Leveraging Duke Energy Business/Community Relations network.
- Conducting more face to face field coordinator market outreach in schools and within education community.
- Developing stronger engagement/marketing to families.
- Revising incentives to better influence the installation of measures.
- Streamlining operational processes.

By keeping the program all inclusive of these audiences, it aids in the sustainability of the program and its message.

Program information is available on our Web sites:
www.duke-energy.com/kidswithenergy and www.scholastic.com/energysmart.

F. Measurement and Verification

Evaluation, Measurement & Verification Schedule

Estimated 2011 Process Reporting	Estimated 2011 Impact Reporting	Estimated 2012 Process Reporting	Estimated 2012 Impact Reporting	Estimated 2013 Process Reporting	Estimated 2013 Impact Reporting
Q2	Q3	Q2	Q2	Q2	Q3

Energy Efficiency Education Program for Schools

Appendix A

K12 Energy Efficiency Program Sample Education Materials

Energy Efficiency Education Program for Schools

Get free books for your classroom!

Inside your **Power in Energy℠** kit, you will find valuable information that will help your students' families save energy.

Get started by distributing the **Power in Energy℠** Family Materials. These materials include a **Home Energy Survey** for families to fill out.

If just five of your students' families fill out and return the survey, you will receive a free class set of books from Scholastic.
In addition, families who return the survey will:

- **Receive a FREE Energy Efficiency Kit**
- **Learn how to reduce energy in the home**
- **Have a chance to win one of 20 iPads**

Encourage your students to participate today!

There's More!

Visit our NEW Web site **www.scholastic.com/powerinenergy** to find additional tools and resources to help your students!

Meet Your State Coordinator!

Get the most out of the **Power in Energy℠** program. Your state coordinator can host assemblies, run workshops, and offer general program support for your classroom. Visit the Web site to find out more!

Energy Efficiency Education Program for Schools

Power in Energy™

Win Big With the Power in Energy℠ Program!

Attention Grade 3-4 Teachers:

Encourage your students to fill out their **Home Energy Surveys** and you will be eligible to **win one of 60 American Express gift cards valued at $25 each**! Here's how it works:

- To be entered in the drawing, get 15 or more of your students to complete and return their **Home Energy Surveys** to Duke Energy by **December 31, 2010**.
- Copies of the survey are included in all **Power in Energy℠** kits, which were distributed to your school in the fall. The **Home Energy Survey** can also be filled out online at **www.powerinenergysurvey.com**.

Send the survey home today to take advantage of this great opportunity for your classroom! Make sure your students put your full name on the survey.

BONUS!
In addition to a chance to win an American Express gift card, all classrooms that complete and return at least five **Home Energy Surveys** will automatically receive **a FREE set of books from Scholastic!**

Contact Your State Coordinator!

Questions about the **Power in Energy℠** program? Contact your state coordinator today!

OHIO:
Michelle White
powerinenergyOH@scholastic.com

NORTH CAROLINA:
Alexandra Keirstead
powerinenergyNC@scholastic.com

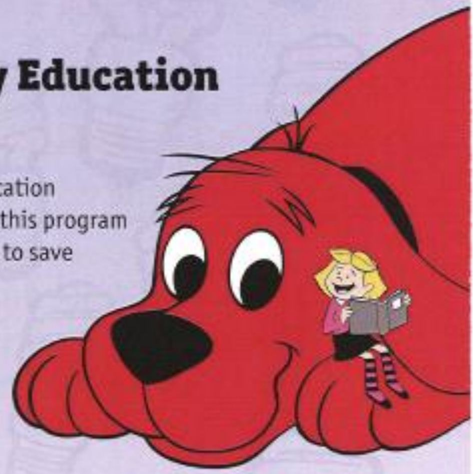
SOUTH CAROLINA:
Emily Matthews
powerinenergySC@scholastic.com

Duke Energy. SCHOLASTIC The Magic School Bus

Energy Efficiency Education Program for Schools

Power in Energy℠

A FREE Energy Efficiency Education Program for Grades K–1



Welcome to **Power in Energy℠**, a brand-new education program featuring Clifford the Big Red Dog! With this program you and your students will discover the best ways to save energy in the classroom and at home.

Created by Scholastic and Duke Energy, this standards-based program will teach your students the value of conserving energy while reinforcing important science and language arts skills and concepts.

Your FREE **Power in Energy℠** education kit includes:

- **Standards-based interactive lessons**
- **Hands-on classroom activities**
- **Family materials for at-home learning**

Take advantage of this great program that was **delivered to your school in the fall.** With Clifford, you and your students will find the **Power in Energy℠**!

Get FREE books for your classroom! Turn the page to find out more.

Duke Energy. SCHOLASTIC Clifford THE BIG RED DOG

Energy Efficiency Education Program for Schools

Get free books for your classroom!

Inside your **Power in Energy℠** kit, you will find valuable information that will help your students' families save energy.

Get started by distributing the **Power in Energy℠** Family Materials. These materials include a **Home Energy Survey** for families to fill out.

If just five of your students' families fill out and return the survey, you will receive a FREE class set of books from Scholastic. In addition, families who return the survey will:

- **Receive a FREE Energy Efficiency Kit**
- **Learn how to reduce energy in the home**
- **Have a chance to win one of 20 iPads**

Encourage your students to participate today!

Meet Your State Coordinator!

Get the most out of the **Power in Energy℠** program. Your state coordinator can host assemblies, run workshops, and offer general program support for your classroom.

Executive Summary

A. Description

During the first quarter 2011 Carolinas Collaborative meeting, Duke Energy is providing an update on the performance of its energy efficiency and demand side management programs for Vintage 1. Our product managers have prepared reports on each of our pilot/programs, describing the offerings and details on pilot/program performance. This executive summary describes how we Duke Energy Caorlinas has done to date in aggregate. Pilot/program specific details will be located in the individual reports.

Pilot/program reports include:

Program	Category	Customer Group
Non-Residential Smart $aver Prescriptive	EE	Non-residential
Non-Residenital Smart $aver Custom	EE	Non-residential
PowerShare	DSM	Non-residential
Residenital Energy Assessments	EE	Residential
Residental Smart $aver	EE	Residential
Low Income Energy Efficiency and Weatherization Assistance Program	EE	Residential
Energy Efficiency Education Programs for Schools	EE	Residential
Power Manager	DSM	Residential
Home Energy Comparison Report	EE	Residential

Audience

All retail Duke Energy Carolinas customers who have not opted out.

B &C. Impacts, Participants and Expenses

The tables below include 2010 results for Vintage 1. The information is for Vintage 1 thru December 2010. The reason we have included nominal avoided cost rather than present value of the avoided costs is because our targets for save-a-watt purposes are based in nominal dollars. Please note that because North Carolina and South Carolina have slightly different avoided costs rates, the targets for each are different.

In our reports we have also not included # of participants from the filing and our % of target for participants. The reason for this is because participants from individual measures can represent, for example, 1 CFL bulb in one measure or 1 six pack in another. Due to the multiple measures in programs, this can skew participation targets and to minimize confusion this information was excluded from the report. Actual participants are included.

North Carolina System Summary[1,2]

$ in Millions	Filed (Vintage 1)	Vintage 1 Actual	% of Target
NC Nominal Avoided Cost	$103.4	$210.8	204%
Program Cost	$35.5	$57.0	161%
NC kW Impact	368,099	562,317	153%
kWh Impact	234,131,697	577,258,512	247%
Units		8,460,551	

Through December 2010, the Company is ahead of its avoided cost target for Vintage 1. This is primarily due to high impacts in the energy efficiency program (Residential Smart $aver). The program cost for Vintage 1 is higher than projected, which has been significantly driven by the increased participation in Residential Smart $aver program.

Energy Efficiency

$ in Millions	Filed (Vintage 1)	Vintage 1 Actual	% of Target
NC Nominal Avoided Cost	$79.7	$175.0	220%
Program Cost	$24.4	$39.8*	164%
kW Impact	37,562	65,502	174%
kWh Impact	234,131,697	577,258,512	247%
Units		8,221,667	

***Includes $4.8M in overheads and non residential energy assessments**

Energy efficiency impacts have primarily been driven by lighting measures in both the residential space. As a percentage of the target, the residential portfolio has exceeded expectations to date. This is a result of a higher take rate for CFLs offerings than originally projected.

Demand Side Management – North Carolina System (to be updated)

$ in Millions	Filed (Vintage 1)	Vintage 1 Actual	% of Target
NC Nominal Avoided Cost	$23.7	$35.6	150%
NC Program Cost	$11.1	$17.2*	154%
NC kW Impact	330,537	496,815	150%
Units		238,884	

***Includes $1.2M in overheads**

1 Numbers included in all tables are rounded

2 Program Costs listed by program do not include approximately $6 million for overheads and non residential energy assessments.

The DSM portfolio is divided between the PowerShare (non-residential) and Power Manager (residential) programs. The Company exceeded targets for avoided cost kW.

Note: Unlike the EE portfolio, where the kWh target is the same, the DSM portfolio has different kW targets for North and South Carolina. This is because while the North Carolina EE docket was never closed, the original South Carolina EE docket was closed, included in the SC rate case, and was adjusted up after the NC filing. Both states have limitations on how much DSM can count towards the 4 year avoided cost, with South Carolina having a higher percentage due to the higher kW target.

D. Qualitative Analysis

Highlights

EE

To date customer participation has been driven primarily by lighting programs and assessments. These measures provide customers with a relatively low cost efficiency upgrade, with minimal hassle, creating a positive initial EE experience. The Residential Smart $aver has seen greater than expected participation. This increase has been primarily driven by the overwhelming participation in the residential CFL offering. The increased participation is attributed to expanding the channels for customers to request CFLs. The new channels are lower cost and provide an improved customer experience.

A second area to highlight is the development of our trade ally network. This network has enabled the Company to minimize acquisition costs be using trade allies as an extended sales force. Providing the trade ally network information on our incentive structure has enabled them to market the incentives to customers.

DSM

DSM programs significantly exceeded targets for Vintage 1. The overall program cost for demand side programs was higher than target. The higher than target program cost is directly related to level of participation of PowerShare in both North and South Carolina.

Issues

There have been a number of issues that have negatively impacted Company specific energy efficiency programs. These programs include Low Income and K-12 EE Education. The issues are addressed in the individual program reports.

Potential Changes

Several programs are reviewing their current processes, and are considering potential changes to increase customer adoption. Potential changes are discussed in individual program reports.

E. Marketing Strategy

Located in individual program reports

F. Measurement and Verification

Located in individual program reports

G. Technical Assumptions

Located in individual program reports

Home Energy Comparison Report Pilot

A. Description

The Home Energy Comparison Report (HECR) is a periodic comparative usage report that compares customers' energy use relative to similar residences in the same geographical area which also gives customers specific energy saving recommendations to encourage energy saving behavior.

The reports are distributed in printed form up to 12 times per year; delivery may be interrupted during the off-peak energy usage months in the fall and spring. The report's energy analysis content for each home is compared to the of average energy use of neighbors in similar home types for the same period. Suggested energy efficiency improvements given the usage profile for that home are also provided. In addition, measure-specific coupons, rebates or audit follow-ups from other Company Programs are offered to sample customers, based on the customer's energy profile.

Audience

The audience is South Carolina customers who are identified through demographic information as likely to decrease energy usage in response to the information contained in the HECR report. These customers reside in individually-metered, owner-occupied, single-family residences receiving concurrent service from the Company. Focusing on owner-occupied residences predisposes the report recipient to invest in energy-saving technology. Analyzing only single-family residences eliminates the possibility of erroneous data caused by thermal transfer between adjacent units in multi-family structures.

B &C. Impacts, Participants and Expenses

$ in thousands	Vintage 1
NC Nominal Avoided Cost	$172
Program Cost[1]	$17.5
kW Impact	555
kWh Impact	2,991,111
Participants	7,899

D. Qualitative Analysis

Highlights

The preliminary six month results show approximately 2% overall savings for pilot participants. The savings are consistent with results achieved from other utilities instituting similar programs. Early results have shown that some participants have reduced overall consumption up to 25% while others have actually increased consumption. These preliminary results indicate that the pilot participants viewed the average home as a target level for consumption. Customers, who achieved a reduction in consumption, tended to live in homes that exhibited consumption higher than average homes and those that increased consumption tended to be in homes that consumed less than the average home.

Issues

[1] Program cost is reflective of 7 months of program operations.

The increase of consumption for individuals based on the average home being viewed as a goal is an issue. This is not the behavior that the Company wants to encourage with this Program.

Potential Changes

The Company plans to file for full commercialization of the program in Q3 of 2011 in both North and South Carolina. Based on final results and analysis of the EM&V the program will make changes. The preliminary recommended changes include exploring the option of a targeting approach which will allow messaging to target specific customers that may be savers or gainers. The Company will test messaging to determine opportunity to decrease consumption for all participants.

E. Marketing Strategy

The marketing for the pilot consisted of proactive reports being distributed through direct mail. The Company is exploring the option of distributing reports via email.

F. Measurement and Verification

EM&V Schedule

Estimated 2011 Process Reporting	Estimated 2011 Impact Reporting	Estimated 2012 Process Reporting	Estimated 2012 Impact Reporting	Estimated 2013 Process Reporting	Estimated 2013 Impact Reporting
Q2	Q3	Q3	Q1 – 2013	Q3	Q4

Low Income Energy Efficiency and Weatherization Assistance Program

A. Description

The purpose of the low income program is to assist low income customers with energy efficiency measures in their home to reduce energy usage. There are three separate offerings currently in the program: weatherization, refrigerator replacement, and the agency assistance kit.

Weatherization and Equipment Replacement Assistance is available for up to 5,000 qualified customers on the Duke Energy Carolinas' system in existing, individually metered, owner-occupied single-family, all-electric residences, condominiums, and mobile homes.

- Funds are available for (i.) weatherization measures, and/or (ii.) refrigerator replacement with an Energy Star appliance, and/or (iii.) heating system replacement with a 14 or greater SEER heat pump. The measures eligible for funding will be determined by an energy audit of the residence.
- A home energy audit will be provided at no charge to the customer.
- Participants are not eligible for payments under any other Duke Energy Carolinas Energy Efficiency Programs for the same energy efficiency measure provided under this program.

The Agency Assistance Kit provides products to qualified customers, such as energy efficiency starter kits and compact fluorescent light bulbs, not to exceed $30.00 in value. The program is available to customers in existing, individually metered, residences, condominiums, apartments and mobile homes. Duke Energy Carolinas partners with local assistance agencies as the avenue to reach customers. Local assistance agencies submit an energy survey via a web based portal, Agency Assistance Portal. Duke Energy currently has over 150 agencies set up to complete surveys in the Carolinas. For completion of the survey, the customer and agency is eligible to receive an incentive. Eligible customers who complete the energy survey are mailed 12 compact florescent light bulbs. The local assistance agencies receive a monetary incentive for each completed survey.

Audience

Weatherization and Refrigerator Replacement

Availability of this program will be coordinated through local agencies that administer state weatherization programs, and the agency must certify that the household income of the participant is between 150% and 200% of the federal poverty level.

Agency Assistance Kit

Any customer eligible for agency assistance may participate in the program.

B& C. Impacts, Participants and Expenses

$ in millions	Filed (Annual)	Vintage 1	% of Target
NC Nominal Avoided Cost	$8.7	$1.8	21%
Program Costs	$2.7	$0.4	15%
Energy Impact (kW)	4,725	692	15%
Energy Impact (kWh)	35,318,559	7,461,298	21%
Units		10,592	

The weatherization and refrigerator replacement program did not report any program participation or impacts because implementation was delayed. The huge increase in the stimulus funds in Carolinas and the change in qualifications made it difficult to incorporate the Duke program into the expanded operations. The low income agencies in NC and SC requested that DE Carolinas delay the rollout until after the stimulus funding expired. The programs have not incurred any expense since the programs did not launch.

The number agency assistance program participants have been significantly lower than projected. Low participation is due to several factors. The rollout of the program was implemented in a phased approach so the adoption was slower than anticipated. Duke Energy continued to work with local assistance agencies to increase program participation, but the agencies have a difficult time incorporating the added step into their process without increasing average customer handle time. The initial projections were overly optimistic and were developed before the current economic situation. The economic down turn has increased the number assistance requests at the agencies which forced many agencies to streamline operations to handle the additional customers.

D. Qualitative Analysis

Issues

Duke Energy's rollout plan includes coordinating the weatherization program through local agencies that administer the state weatherization program. The objective of the DE Carolinas filed weatherization model includes complimenting work being done with the existing weatherization network. Since the approval of save-a-watt, several major changes have occurred with the state's weatherization program. With such substantial increase in funding, the opportunity for Duke Energy to compliment the state's program has been impacted.

With an increase in weatherization funding from the Department of Energy (DOE), the existing state program must undergo more complex requirements to provide services to eligible customers. The American Recovery and Reinvestment Act (AARA) stimulus dollars have been released and can be spent from 2009 to March 2012. With the approval of AARA funding, the state weatherization funding has increased by over 500% from traditional funding levels. Due to such a significant increase in funding, the opportunity and need to "piggyback" the existing network is limited.

Duke Energy continues to communicate with state contacts from both North and South Carolina to identify opportunities to implement DE Carolinas income qualified weatherization programs. The feedback from both states requested that Duke Energy delay the launch of programs until after March 2012 when he ARRA funds expire.

Other challenges involving program implementation include the following components:

- ARRA presents additional challenges related to reporting and requirements for the both the local agencies and state. Because of DE Carolinas restrictions in the filing, weatherization agencies could only piggyback DE Carolinas program measures in DE Carolinas total electric homes. This stipulation adds a level of complexity when measures can't be installed in all Duke Energy homes regardless of the energy source.

- Duke Energy's customer eligibility for program participation is not consistent with the eligibility of the state's weatherization program. This impacts the qualification process for Duke Energy program participants. The income eligibility for state funded weatherization is all customers up to 200% of the federal poverty level. Duke Energy's current program eligibility is all electric homes which are owner occupied between 150% and 200% of the federal poverty level. To reduce complexity, DE Carolinas plans to align customer eligibility with state requirements.

For agency assistance kits, local assistance agencies have been slow to adopt the offering of survey completion to eligible customers. Due to the economic downturn, the number of customers visiting local assistance agencies has increased. Some agencies have reported a 200% increase in client visits. Duke Energy continues to explore avenues to increase program participation for low income customers. The implementation of the IVR/Web CFL program, customers may request CFLs, track their order and determine the number of bulbs they are eligible to receive right from the comfort of their home. This channel was implemented in fourth quarter of 2011 and demonstrated wide adoption to all segments including income qualified customers. In 2010, the non-low income CFL distribution channels reached over 300,000 low income customers.

Potential Changes

Duke Energy continues to evaluate opportunities to provided new offerings to low income customers in the most cost effective manner. Duke Energy plans to seek regulatory approval to discontinue offering the Agency Assistance Kits. The offering of CFLs via the IVR/Web channel has reached more low income customers than the Low Income CFL program. The IVR/Web offering is a more cost effective avenue to reach low income customers.

Duke Energy plans to file a new Low Income Neighborhood program. This program will target neighborhoods where the majority of the residents are below 200% of the federal poverty guidelines. This Neighborhood Low Income program is being modeled after a Program currently being offered by Progress Energy.

E. Marketing strategy

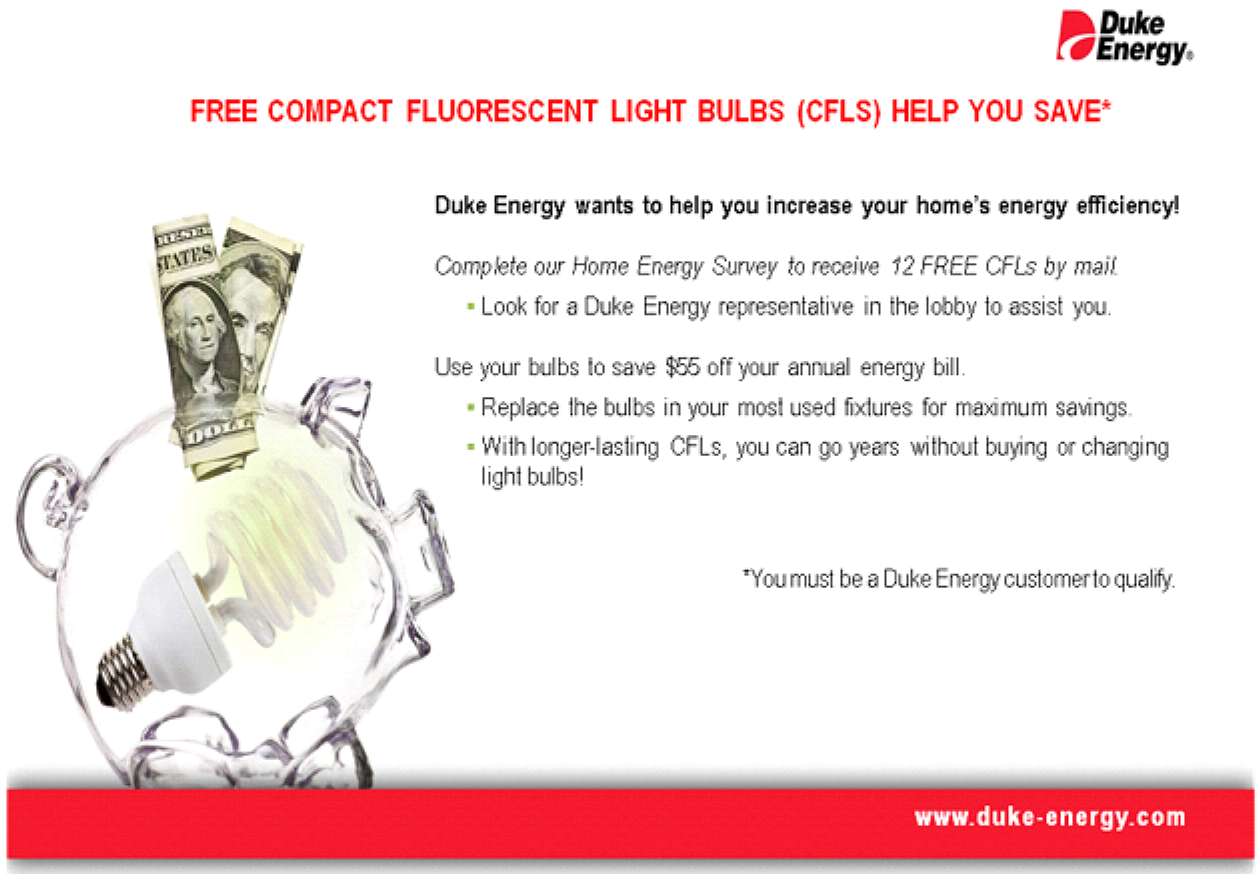
Customer participation is achieved by working with local assistance agencies. All marketing of the program is conducted by each local assistance agencies who offers the program to eligible customers. Some agencies offer the program to each client while others provide signage promoting the program. Appendix A includes an example of information shown by a local assistance agency promoting the program. This information is presented on wide screen monitors located in the lobby of the agency.

F. Measurement and Verification

Estimated 2011 Process Reporting	Estimated 2011 Impact Reporting	Estimated 2012 Process Reporting	Estimated 2012 Impact Reporting	Estimated 2013 Process Reporting	Estimated 2013 Impact Reporting
Q4	Q4	Q1	Q4	Q3	Q3

Appendix A

Low Income CFL Promotion Material



Non-Residential Smart Saver® Program: Smart $aver Prescriptive

A. Description

The Smart $aver™ Non-residential Prescriptive Incentive Program provides incentives to commercial and industrial consumers to install high efficiency equipment in applications involving new construction, retrofit, and replacement of failed equipment. Incentives are provided based on Duke Energy Carolina's cost effectiveness modeling to assure cost effectiveness over the life of the measure.

Commercial and industrial consumers can have significant energy consumption, but may lack knowledge and understanding of the benefits of high efficiency alternatives. Duke Energy Carolina's program provides financial incentives to help reduce the cost differential between the standard and high efficiency equipment, offer a quicker return on investment, saves money on their utility bill that can be reinvested in their business, and fosters a cleaner environment. It also provides market demand where the dealers and distributors, or market providers, will stock and provide these high efficient alternatives as they see increased demand for the products. Higher demand can result in lower prices.

The program promotes prescriptive incentives for the following technologies – lighting, HVAC, motors, pumps, variable frequency drives, food services and process equipment. Equipment and incentives are predefined based on current market assumptions and Duke's engineering analysis. The eligible measures, incentives and requirements for both equipment and customer eligibility are listed in the applications posted on Duke's Business and Large Business websites for each technology type.

Duke Energy contracts with Wisconsin Energy Conservation Corporation (WECC) to handle the fulfillment responsibilities of the program and to provide training and technical support to our Trade Ally (TA) network. CustomerLink provides call center services to customers who call the program's toll free number specific to the Smart $aver Prescriptive Program.

Audience

All Duke Energy North and South Carolina non-residential electric customers except those that chose to opt out of the program.

B &C. Impacts, Participants and Expenses

$ in Millions	**Filed Annual**	**Vintage 1**	**% of Target**
NC Nominal AC	**$20.8**	**$39.1**	**188%**
Program Cost	**$4.4**	**$4.8**	**109%**
kW	8,194	**14,466**	**177%**
kWh	31,745,599	**56,620,341**	178%
Units		**326,446**	

Note: Costs are grouped together with Smart $aver Custom. Filed annual represents program specific filing amount, actual are group together, and the percentage is the % spend of the combined (custom & prescriptive) amount.

Consistent with other states programs; lighting measureT8 and T5 High Bays, CFL bulbs, and occupancy sensors have provided the vast majority of impacts and participation to date. Lighting installations have a shorter payback period than most other technologies making it easier for customers to participate. Motors, pumps, and variable frequency drives as well as HVAC units were also large drivers of impacts.

Duke attributes the higher than expected participation to a number of reasons:

- More pent up demand than expected – business customers are looking for ways to save money
- Corporate goals tied to energy efficiency – Large Business and National Account customers continue to be a driving force in the higher than expected participation.
- Trade Ally outreach program (provided by WECC) – providing training and support to our Trade Allies who are typically the first point of contact for customers considering these types of projects.
- Duke's internal customer segment teams – providing training and support to customers

To date, the company has been able to leverage support costs and its trade ally network across its regions to minimize the marketing and administrative costs. However the potential exists that acquisition costs may raise as the program continues to mature.

D. Qualitative Analysis

Highlights

Getting the Trade Allies to buy into the program has proven to be the most effective way to promote the program to our business customers. At program rollout, Duke and the WECC Trade Ally team took an aggressive approach to contacting trade allies associated with the technologies in and around Duke Energy's service territory. To-date approximately 450 Trade Allies across both states, representing the different technologies are signed up as Participating Trade Allies. Their company name and contact information appears on the TA search tool located on the Smart $aver™ website. This tool was designed to help customers who do not work with a local TA, find someone in their location who can serve their needs. WECC manages the Trade Ally database where contact information and participation is reported.

Duke continues to look for ways to engage the Trade Allies in promotion of the program, including the utilization of focus groups. Suggestions were obtained from two focus groups of top TA Lighting and HVAC performers in North and South Carolina held in November 2009 and have resulted in the development of an email application submission option. Other suggestions included limited time bonus incentives and a Trade Ally bonus program.

Duke continues to develop case studies and testimonials from customers who have participated in the program to be used to help promote the program – showing actual savings and benefits for each technology type.

Issues

Although participation in lighting continues to be better than expected there are other measures that provide greater savings to customers that have had little or no participation. Examples of these are Heat Pump Water Heaters, some Food Services equipment and Compressed Air nozzles. In some cases, this is due to the cost of these measures but until demand increases, market costs are not likely to go down. Duke continues to work with experienced engineering consultants and WECC who are familiar with the challenges of moving the market, to develop a strategy for increasing the participation for these measures going forward including the development of targeted marketing campaigns to increase participation in high impact measures notably variable frequency drives.

Another challenge is the continued weakness of the economy which has resulted in lower than estimated participation in certain measures. Many businesses have capital projects that have been approved but are sitting on the shelf until the economy becomes more stable.

Potential Changes

Standards continue to change and new, more efficient technologies continue to emerge in the market. The Company expects to continue to add new measures to approved programs to provide incentives for a broader suite of products for customers to take advantage of.

E. Marketing Strategy

- Primary delivery of the program is through the existing market channels, equipment providers and contractors. WECC's Trade Ally Team provides training and technical assistance to stimulate additional participation and to address identified market barriers.

- Duke Energy's Large Business Customers received e-mails and informational materials from their Account Managers at program rollout and continuously throughout the year. The Account Managers work closely with their customers from project planning stage through application submittal.

- Duke Energy's Small Business customers receive newsletters and emails announcing program updates.

- Duke Energy Segment Managers focused on specific markets within their customer class and targeted them with special promotions (webinars, collateral) and support to improve penetration of the technologies where there is the best potential, the biggest customer need, or the best opportunity for long-term market effects.

- Duke's Business Service Center and CustomerLink promote the program when answering calls from business customers.

  Duke Energy's North and South Carolina business and large business websites are a great source of program information. Customers can go to the websites and learn about the program and its benefits, search for participating vendors, ask questions on-line and fill out and print all the applications.
- In conjunction with WECC, participate in various trade shows, conferences, and energy forums to educate customers and vendors on the benefits of the program, portfolio offerings, and program requirements.

- Develop case studies and customer testimonials to profile actual savings and benefits for each technology type. Case studies and testimonials will be used in a variety of marketing channels.

- Duke's marketing efforts for the Smart $aver ™ Prescriptive Program is often done in conjunction with the Custom Program.

F. Measurement and Verification

EM&V Schedule

Estimated 2011 Process Reporting	Estimated 2011 Impact Reporting	Estimated 2012 Process Reporting	Estimated 2012 Impact Reporting	Estimated 2013 Process Reporting	Estimated 2013 Impact Reporting
Q2	**Q4**	**Q2**	**Q2**	**Q3**	**Q4**

Marketing Materials

North Carolina Website

http://www.duke-energy.com/north-carolina-business.asp

South Carolina Website

http://www.duke-energy.com/south-carolina-business.asp

Non-Residential Smart $aver® Program: Smart Saver Custom

A. Description

Duke Energy's Smart $aver Non-Residential Custom Incentive Program offers financial assistance to qualifying commercial, industrial and institutional customers (that have not opted out) to enhance their ability to adopt and install cost-effective electrical energy efficiency projects.

The Smart $aver Custom Incentive program is designed to meet the needs of Duke Energy customers with electrical energy saving projects involving more complicated or alternative technologies, or those measures not covered by standard Prescriptive Smart $aver Incentives. The intent of the Smart $aver Program is to encourage the implementation of energy efficiency projects that would not otherwise be completed without Duke Energy's technical or financial assistance.

The Custom Incentive application is for projects that are not addressed by the applications for Smart $aver Prescriptive Incentives. An important distinction is that unlike the Prescriptive Incentives, Custom Incentives do require pre-approval prior to the project implementation. Proposed energy efficiency measures may be eligible for Custom Incentives, if they clearly reduce electrical consumption and/or demand.

Currently there are the following application forms that are located on the Duke Energy website under the Smart $aver Incentives (Business and Large Business tabs):

- Optional pre-screen form that allows customers and their vendors to submit preliminary project information and receive feedback on potential eligibility and tips on filling out the application form.
    - Smart Saver Custom Incentive Pre-screen Form (doc, 102 KB)

- Generic Custom Application, offered in word and pdf format. Customers or their vendors submit the form with supporting documentation for any type of energy efficiency project. Form is designed for multiple projects and multiple locations.
    - Custom Incentive Application (doc, 374 KB)
    - Custom Incentive Application (pdf, 83 KB)

- Custom lighting application (2 parts) is optional. For lighting projects, customers and their vendors can use the generic custom application form or use the 2-part lighting application that includes an excel worksheet with step-by-step instructions.
    - Custom Lighting Incentive Application - Part I (doc, 196 KB)
    - Custom Lighting Incentive Application - Part II (xls, 89 KB)

Audience

Commercial, industrial and institutional customers

B& C. Impacts, Participants and Expenses

$ in millions	Filed (Annual)	Vintage 1	% of Target
NC Nominal Avoided Cost	$8.4	$9.5	113%
Program Cost	$4.7	$1.6	34%
Energy Impact (kW)	1,927	2,596	135%
Energy Impact (kWh)	12,096,000	20,892,129	173%
Units		4,113	

During 2010, custom incentives were paid on a wide variety of projects such as (in order of total incentives paid): energy management/building controls systems $395,921, lighting $248,264, HVAC system upgrades $109,500, motors $92,224, variable speed drives $54,270, compressed air $30,000, thermal envelope $8,000 and an additional $131,000 incentives on projects that are outside these classifications.

D. Qualitative Analysis

Highlights
Participation was strong in 2010, and is expected to grow significantly in 2011 and beyond. The number of new applications and inquiries has seen steady growth.

The efforts to educate the vendors who sell energy efficient equipment (trade allies) have been very successful. In many cases, the vendor will submit the paperwork for the Duke Energy customer, which eliminates a barrier for customers that do not have the resources to devote to the application.

Issues
The custom incentive application process is considered burdensome by some customers due to the technical review that is performed on all projects that apply for a custom incentive. The technical review often requires customers (or their vendor) to quantify the projected energy savings from the proposed project. This can be a lengthy process that can require some level of engineering expertise. This requirement will continue, thus ensuring that incentives are being paid for cost-effective verifiable efficiency gains. Those technologies that seem to be a good fit for the Smart $aver prescriptive program will be recommended for addition to the prescriptive application(s). The more that is offered through the prescriptive applications, the fewer burdens there are on the customer that prevents participation in the Smart $aver program.

Potential Changes
Duke Energy is testing a new marketing concept that attempts to combine Assessments with Smart $aver custom incentives to encourage Commercial customers to identify and implement Energy Conservation Measures (ECMs) within their facilities. This concept is named Smart Building Advantage (SBA). SBA encourages customers to conduct detailed assessments of their facilities in order to identify financially viable modifications that will improve efficiency and reduce their electric costs. SBA is designed to develop investment grade efficiency recommendations for customers and provide assistance in applying for Smart $aver incentives. Customers are more likely to invest in energy

efficiency modifications if they can receive assistance in identifying changes that result in clear operational and financial benefits. SBA helps the customer through the process to ensure they have solid recommendations from which they can make sound financial decisions around energy efficiency changes. .

E. Marketing Strategy

The marketing strategy for custom incentives is tied to the Smart $aver prescriptive incentives. See the report on prescriptive incentives for a description. The strategy is to promote prescriptive incentives, which show pre-approved incentive amounts that get customers interested in a project and are designed for a high volume of applications. Then, if a customer's project does not fall under prescriptive incentives, the custom application is there to offer an alternative.

F. Measurement and Verification

EM&V Schedule

Estimated 2011 Process Reporting	Estimated 2011 Impact Reporting	Estimated 2012 Process Reporting	Estimated 2012 Impact Reporting	Estimated 2013 Process Reporting	Estimated 2013 Impact Reporting
Q2	Q4	Q2	Q2	Q3	Q4

Power Manager®

A. Description

The purpose of the Power Manager program is to reduce electric demand by cycling residential air conditioning usage during peak demand conditions in the summer months. The program is offered to residential customers with central air conditioning. Duke Energy installs a load cycling device to the outdoor unit of a customer's air conditioner. This enables the customer's air conditioner to be cycled off and on when the load on Duke Energy's system reaches peak levels. Customers receive financial incentives for participating in this program. The customer receives a yearly $8 per month bill credit in the months of July through October for their program participation.

The cycling of the customer's air-conditioning system has shown that there is no adverse impact on the operation of the air-conditioning system. However, customers can opt out of the program if desired. The load control device has built-in safe guards to prevent the "short cycling" of the air-conditioning system. The air-conditioning system will always run the minimum amount of time required by the manufacturer. The cycling simply causes the air-conditioning system to run less, which is no different than what it does on milder days. Additionally, the indoor fan will continue to run and circulate air during the cycling event.

Audience

This program is available to North and South Carolina residential customers residing in owner-occupied, single-family residences with a functioning outdoor air conditioning unit.

B & C. Impacts, Participants and Expensed

$ in millions	Filed (Annual)	Vintage 1	% of Target
NC Nominal Avoided Cost	$17.5	$16.6	95%
NC Program Costs	$6.4	$8.6	134%
NC Energy Impact (kW)	244,442	231,882	95%
Units		238,769	

Variance

As a result of lower than expected Power Manager enrollments, Duke Energy conducted customer research in early 2010. Results indicated three main drivers for the lack of enrollments: 1) the $35 installation fee, 2) concern over loss of comfort, 3) environmental control and concern about the effect on their air conditioning equipment. The first two were the most-often cited reasons at forty percent (40%) and thirty-eight percent (38%) respectively. Marketing materials were changed to address these concerns. However, given the economy and the $35 installation charge, new enrollments remain low, so acquisition has been minimized.

D. Qualitative Analysis

Highlights

Participants in the Power Manager program allow Duke Energy to control their air conditioners during peak summer demand periods. For their participation in the program, customers receive $32 each year through an $8 credit on their July – October bills. Credits are given whether or not a Power Manager event occurs.

The summer of 2010 was the first summer in which Power Manager was available in both NC and SC. Due to the extreme heat and subsequent high electric demand; Power Manager was activated on eight different days in the Carolinas. During these events, Duke Energy cycled customers' air conditioning units off and on, helping shift demand and lower the peak.

Issues

Given the low number of new enrollments, coupled with customers who left the program, customer participation declined from 179,000 to 176,000 in 2010.

Duke Energy is currently experiencing low response rates for signups. A survey was recently completed for the program. The survey's primary purpose is to determine why non-participating customers are not adopting the program and to make recommendations that can improve response rates.. A significant barrier to participation is that customers pay a $35 wiring charge after the device is installed for participation in the program.

Potential Changes

To help increase the response rates for direct mail campaigns for the Power Manager program, Duke Energy will be seeking approval to remove the $35 installation fee from the program. In addition, Duke Energy is in the process of redesigning the brochures to enhance the environmental message and reassure customers that the program is safe for their equipment. DE Carolinas will minimize customer acquisition activities until the offer can be improved to attract more customers.
Duke Energy will utilize a proven quality assurance process to aggressively evaluate the existing devices to determine the reliability. The low performing devices will be repaired or replaced.

E. Marketing Strategy

Direct mail marketing will be used when acquiring new customers for the program. Customers are targeted geographically, which allows for shorter customer wait time for installation and more efficient routes for the installers. Program information is also available to customers on the Power Manager Web site located at http://www.duke-energy.com/north-carolina/savings/power-manager.asp.

F. Measurement and Verification

Evaluation, Measurement & Verification Schedule

Estimated 2011 Process Reporting	Estimated 2011 Impact Reporting	Estimated 2012 Process Reporting	Estimated 2012 Impact Reporting	Estimated 2013 Process Reporting	Estimated 2013 Impact Reporting
Q2	**Q2**	**Q1**	**Q2**	**Q1**	**Q2**

A. Description

PowerShare® is Duke Energy's demand side management (or demand response) program geared toward Commercial and Industrial customers. Currently made up of Mandatory (PS-M), Generator (PS-G), Voluntary (PS-V), and CallOption (in SC) options, customers can choose from a variety of offers. Under PS-M and PS-G, customers receive capacity credits for their willingness to shed load during times of peak system usage. These credits are received if an event is called or not. Energy credits are also available for participation (shedding load) during curtailment events. The notice to curtail under these offers is often rather short (15-30 minutes) and there are penalties for non-compliance during an event.

Audience
PowerShare® is offered to non-residential customers who are able to meet the load shedding requirements.

B & C. Impacts, Participants and Expenses

$ in Millions	Filed (Annual)	Vintage 1	% of Target
NC Nominal Avoided Cost	**$6.2**	**$19.0**	**306%**
NC Program Costs	**$4.7**	**$7.3**	**155%**
NC kW Impact	**86,095**	**264,933**	**308%**
Units		**115**	

Variance
PowerShare® participation (as measure in impacts) is above target (on a system basis)—as did Avoided Costs and Program Costs during 2010. With the Commission ruling that split the DSM and EE portions of the North Carolina rider (and aligned the rider structure with SC), some customers did opt-in to PowerShare® offerings at the end of the year. A portion of this impact was seen in the last months of 2010 and there is more that will be first counted as a resource in 2011.

Note: Unlike the EE portfolio, where the kWh target is the same, the DSM portfolio has different kW targets for North and South Carolina. This is because while the North Carolina EE docket was never closed, the original South Carolina EE docket was closed, included in the SC rate case, and was adjusted up after the NC filing. Both states have limitations on how much DSM can count towards the 4 year avoided cost, with South Carolina having a higher percentage due to the higher kW target.

D. Qualitative Analysis

Program Highlights
PS-Mandatory and PS-Generator have been well received by customers in both states. Most IS and SG customers in South Carolina moved over to PS-M and PS-G, respectively. The former SG customers that did not switch were mostly small generators and don't qualify for PS-G because of the minimum

curtailable load requirement. CallOption might be an option for these customers with its reduced minimum requirement, and we hope to see more of these customers sign-up during 2011.

Program Issues
Based on customer feedback received during focus group sessions, customer indicated they wanted more options, greater flexibility and longer lead time (notice) of events. For example, some customers could not respond in the 15 or 30 minute afforded under the existing programs. Duke Energy took that feedback and used it to shape the parameters of CallOption. This new offer provides for a minimum of 6 hours advanced notice and allows the customer to pick a level of commitment to curtailing load. For a willingness to participate in more events, Duke is able to pay the customer more in capacity credits.

Potential Changes
As a way of building on to the existing options, Duke Energy proposed CallOption as a new offer under the PowerShare® umbrella. With CallOption, customers receive a longer notification window and can qualify to participate at lower curtailable loads. This means customers who would otherwise not be able to participate in PowerShare® can earn capacity credits for their willingness to shed load during times of peak usage and receive energy credits when they respond to curtailment events. Furthermore, for economic events, customers have the option of buying through the event without paying penalties or being subject to expulsion from the program. Customers get to choose their level of participation by selecting the number of potential events for which they want to sign up. This gives them the flexibility to increase their capacity credits. Also, more flexibility is included in how the curtailable load is calculated, either a firm demand is set by the customer (similar to PS-M, PS-G or PS-V) or they establish a fixed demand reduction and shed a specific amount of energy below their projected usage on an hourly basis. While CallOption has been approved in South Carolina it is still pending a Commission ruling in North Carolina.

E. Marketing Strategy

Marketing efforts for PowerShare® have focused on the relationship between the Account Managers and their assigned customers. As part of their normal contact with customers, the Account Managers have introduced PowerShare®, including any new options/offers while explaining the value proposition to the customer. These visits are supported with in-house, analytical spreadsheets, showing the specific incentives for each offer as applied to the customer's specific load profile as well as collateral to explain the details of all the PowerShare® offers.

In addition to the above marketing efforts, webinars were held to introduce CallIOption and to review the details around the PowerShare® offers. Multiple sessions were offered with varying levels of participation. Since the primary focus in SC during 2010 was on converting previous IS and SG participants to PowerShare®, there were not the same amount of time put into selling new participants on CallOption. We will conduct further training with the Account Managers in 2011 in an effort to create "new" PowerShare® customers via CallOption. Due to the marking efforts, we received high enrollment of customers in a short time.

F. Measurement and Verification

EM&V Schedule

Estimated 2011 Process Reporting	Estimated 2011 Impact Reporting	Estimated 2012 Process Reporting	Estimated 2012 Impact Reporting	Estimated 2013 Process Reporting	Estimated 2013 Impact Reporting

Q2	**Q3**	**Q2**	**Q3**	**Q2**	**Q3**

G. Technical Assumptions

Impacts vary based on the amount of load customers opt to make available.

Residential Energy Assessments

A. Description

The Residential Energy Assessments program includes two separate measures: 1) Personalized Energy Report (PER) ® and 2) Home Energy House Call.

The Personalized Energy Report (PER)® Program is a residential energy efficiency program that provides single family home customers with a customized report about their home and family and how they use energy, which can be provided in two ways: 1) postal mail 2) online. The overall goal is to help the customer better understand his/her energy and to better manage energy costs. In addition, the customer receives CFLs as an incentive to participate in the program.

The PER program have two variations: The first is a mailed offer, and the second is an online offer to our customers that have signed into our Online Services (OLS) bill pay and view environment. The mailed PER offer involves more work, but it appeals to certain market segments. Eligible customers are chosen by the Duke Energy market analytics team to maximize the participation by mailing an offer to those customers most likely to respond. This program targets those customers who may not have access to a computer or would not answer an online survey. However, since the online survey participants are much easier to process, both means of completing the survey are offered. Online participants get their PER online in a printable PDF, and customers mailing the energy survey receive their PER in the mail.

The Online Energy Survey is offered two ways.

1) We offer it as part of the mailed PER offer, and 5 percent to 10 percent of the participants choose the online survey instead of the return mail survey.
2) We also offer the online survey to other eligible customers when they visit their account information online.

We track these two types of survey participants separately.

Home Energy House Call (HEHC) is a free in-home assessment designed to help our customers learn about home energy usage and how to save on monthly bills. The program provides personalized information unique to the customer's home and energy practices. An energy specialist visits the customer's home to analyze the total home energy usage and to pinpoint energy saving opportunities. An energy specialist will also explain how to improve the heating and cooling comfort levels, check for air leaks, examine insulation levels, review appliances, help the customer preserve the environment for the future and keep electric costs low. A customized report is prepared, explaining the steps the customer can take to increase efficiency. As a part of the Home Energy House Call program, customers receive an Energy Efficiency Starter Kit. At the request of the customer, the energy specialist can install the efficiency items that allow the customer to begin savings immediately.

The HEHC program is administered by a third party vendor, Wisconsin Energy Conservation Corporation (WECC). WECC provides support services based on Duke Energy forecasts; schedules and completes audits; and reports and uploads results to Duke's participation database. Additional key vendors include ProtoType, which is responsible for mailing customer acquisition brochures, CustomerLink , which is the call center providing customer care support and scheduling and Niagara, which is accountable for creating the Energy Efficiency Starter kits the customer receives at the time of the audit.

Audience

Residential customers

Residential Energy Assessments

B&C. Impacts and Participants

$ in millions	Filed (Annual)	Vintage 1	% of Target
NC Nominal Avoided Cost	$6.7	$ 4.5	67%
Program Costs	$2.8	$2.4	86%
Energy Impact (kW)	3,684	1,867	51%
Energy Impact (kWh)	24,762,131	15,684,653	63%
Units		34,681	

D. Qualitative Analysis Highlights

Personalized Energy Report: Regarding the mailed PER offer, one of the most important attributes to our success is the ability of our internal market analytics to use market segment information and predict the potential response rates of different residential segments. Often, in this day of electronic correspondence, customers who get an opportunity to respond to a mailed survey instead of an online survey, are eager to participate.

The PER campaign began in the fall of 2009 with 175,308 offers mailed to North and South Carolina customers. Much of the participation was seen in 2009, but the activity continued into 2010 with 23,532 participants. The total campaign customer response rate was approximately 24%.

Carolina's PER Participation from January 2010 to December 2010

State	Total participation
North Carolina	16,983
South Carolina	6,549
Total Carolinas	**23,532**

The Online Survey offer to OLS customers continued in 2010. Participation increased during active promotions, such as the online reminder to complete the survey for a free six pack of CFLs.

Carolina's OLS Survey Participation from January 2010 to December 2010

State	Total participation
North Carolina	3,364
South Carolina	1,297
Total Carolinas	**4,661**

Home Energy House Call: The Home Energy House Call program is offered to residential home owners. The annual goal was 5000 for the Carolinas; due to increased customer interest, we exceeded our goal with customers sitting on our waiting list until appointments became available.

Residential Energy Assessments

Carolina's HEHC In-Home Assessment Participation January 2010 to December 2010

State	Total participation
North Carolina	4,690
South Carolina	1,798
Total Carolinas	**6,488**

These participants responded to our direct mailing brochure and registered by phone, mail or online. Once appointments were scheduled, an energy specialist arrived at their homes to identify potential energy problems and to provide an Energy Efficiency Starter Kit, as well as additional CFLs.

Issues

1. We had several issues with the PER data transfer between Duke and Aclara (former vendor), and the scan process was challenged by the overwhelming response. All the offers went out at the same time, and in the future, we have agreed that the offer being mailed in separate waves would be an improvement. All processing issues have been resolved for future campaigns.

2. Increased interest in the HEHC program has created a larger than normal waiting list over 45 days. HEHC is a new program in the Carolinas, and word of mouth has been successful, as well as a hindrance. Everyone has been trying to take advantage of this program due to the home energy audit, Energy Starter Kit and a detailed report pinpointing potential energy inefficiencies. Additional auditors have been supplied to reduce the backlog, and we have found that most customers are willing to wait because of the idea of having an energy specialist visit their homes. Increased spending has occurred due to increased awareness of the new product in the market place. Knowing there is a delicate balance of supply and demand, we have created a reporting tool to assist with mail drop estimates to avoid customers being placed on our waiting lists.

3. In the current market, we are seeing an approximate 2% response rate across all five of our service states, which is adequate, but for this type of program, HEHC should have a higher response rate especially during such hard economic times. We are currently working on how to increase the response rates while reducing direct mail drops.

Potential Changes

- Future PER campaigns will emphasize the online survey as being the fastest way to receive the report and the CFLs, but paper reports will still be available.
- With so many customers willing to participate in HEHC, program goals were met in August for the Carolinas. We have decided to extend the goal in the Carolinas to a "do not exceed" amount because of how difficult it is to find such talented auditors that are customer friendly and already have been with the program since January of 2009. Our customers are continuing to call Customer Link, and the program is in such demand, we do not want to lose momentum in the market place.
- For the HEHC program, specialty bulbs are being considered as additions to the program (DSMore runs are taking place currently). These specialty bulbs include candelabra and recessed lighting bulbs. We have found most homes have lighting fixtures requiring these specialty bulbs, and this is a huge opportunity to consider for HEHC.

Residential Energy Assessments

- Currently, program enhancements are taking place. CustomerLink scripts are being improved to inform the customer of the EE Starter Kit and installation of CFLs. The customer reminder call prompts customers about their appointments to decrease cancellation rates, as well as to begin looking for places to install efficiency measures. We also are looking into reducing the number of questions our auditors ask during the in-home assessment. By saving time with how many questions a customer has to answer, our auditors are able to focus more on energy savings inside the home while installing more measures. By making these improvements, this will allow Duke Energy to increase impacts from each participant in the program.
- Duke Energy's marketing analytics team has the ability to pull customer information directly from our billing system. Marketing analytics will receive a list of zip locations to target and will pull customer data and send to ProtoType for further scrubbing before brochures are mailed. Some TV and Radio media has been used when requested. The overall strategy for this program is to reach all customers in Duke Energy's service territory, to promote energy efficiency by customers understanding the importance of conservation and helping the environment. By customers reducing their electric bill, Duke Energy is able to reduce its need to build additional power plants and, ultimately, keep its rates as low as possible. Since the HEHC program is being distributed to all customers in our service territory, the energy efficiency message is available for customers to take advantage of.

HEHC Program information is available to all customers on the Duke Energy Web site:
http://www.duke-energy.com/north-carolina/savings/home-energy-house-call.asp.

E. Marketing Strategy

The overall strategy for the mailed PER campaign is to maximize the response rate of the mailed offer. Since the mailed offer includes a survey that is preprinted with specific customer coding, the initial expense of the mailing needs to be considered for the cost effectiveness of the program. Maximizing the response rate greatly influences the cost effectiveness. Some customers try to participate more than once in the online program, but we do not mail duplicate CFLs within this particular program offer.

Of equal importance to the installation of CFLs is the content of the PER report, which is designed to duplicate what a customer would see in his/her online PER report, has a goal is to help customers review their past energy use, compare their usage to other similar homes, understand where the energy use is going and to read tips on how to conserve.

The marketing strategy for the HEHC program is to pre-qualify customers before sending out direct mail brochures. Pre-qualification of customers will reduce overall customer acquisition costs. Analyzing HEHC's previous customer data, such as response rates and seasonal trends, this analysis will help balance the load of supply and demand while minimizing customer wait time. HEHC registration is also available online to reduce mail costs as well. Maximizing response rates are key for overall program cost effectiveness.

F. Measurement and Verification

Residential Energy Assessments

Evaluation, Measurement & Verification Schedule

Personalized Energy Report/Online Services Survey

Estimated 2011 Process Reporting	Estimated 2011 Impact Reporting	Estimated 2012 Process Reporting	Estimated 2012 Impact Reporting	Estimated 2013 Process Reporting	Estimated 2013 Impact Reporting
Q2	Q2	Q2	Q4	Q4	Q4

Home Energy House Call

Estimated 2011 Process Reporting	Estimated 2011 Impact Reporting	Estimated 2012 Process Reporting	Estimated 2012 Impact Reporting	Estimated 2013 Process Reporting	Estimated 2013 Impact Reporting
Q2	Q2	Q2	Q4	Q4	Q4

Appendix

Residential Energy Assessments

DUKE ENERGY
139 East Fourth Street
Cincinnati, OH 45202

September 17, 2009

Dear

Duke Energy understands your concern about your rising energy costs. That's why we're pleased to offer a free **Personalized Energy Report (PER)™**. The report details how you use energy and how you can save energy. Plus, for a limited time you will also receive a **free** six pack of Compact Fluorescent Light Bulbs (CFLs). An ENERGY STAR®-qualified CFL saves about $30 in energy costs over its lifetime. Replace your home's six most frequently used bulbs with CFLs and watch your savings grow to $150.

Your Personalized Energy Report will provide you with a better understanding of your energy usage and offer customized ideas to help you save money on your monthly bill. You simply answer a few questions about your home appliances and how you use energy, and the report is personalized for you.

With the Personalized Energy Report you can:

- Understand how your household uses energy
- View your home's month-to-month energy usage and bill amount trends
- Compare your home's energy usage to similar households in your area
- Receive energy savings tips for your home
- Learn about programs that may save you money

Get Your FREE Personalized Energy Report and Six Pack of CFLs Now

Just complete the Home Energy Survey. You can complete the survey in one of two ways:

- **Online**. Go to www.duke-energy.com. If you are a current Online Services user, sign in to manage your account. If you are a new online user, click Register to sign up. Once you sign in, take the brief Energy Survey, you will see your customized Personalized Energy Report online immediately.

Important: To receive your free six pack of CFLs, you must enter promotion code 1901 at the bottom of the Energy Survey Web page.

While you are at our Web site, check out all the other energy saving information, interactive tools and programs we offer to help you save energy and money.

- **Paper**. If you prefer, you can complete the enclosed questionnaire and mail it in the postage-paid envelope before September 30, 2009. Your Personalized Energy Report will be mailed to your home within three weeks from the date we receive the completed questionnaire.

You will receive your free six pack of CFLs soon after you receive your Personalized Energy Report. Thank you for your interest in saving energy. We look forward to helping you take control of your monthly energy costs.

D. Welklin

D. Welklin
Personalized Energy Report Manager

Residential Energy Assessments

RECEIVE YOUR FREE, PERSONALIZED ENERGY REPORT (PER)™

FOR THE ADDRESS SHOWN ABOVE, PLEASE ANSWER THE FOLLOWING QUESTIONS RELATED TO YOUR HOME AND ENERGY USAGE. FILL IN THE CIRCLES COMPLETELY USING BLUE OR BLACK INK.

PROPERTY DETAILS

1. What type of home best describes your primary residence? *(check only one)*
   - Detached single family
   - Duplex / 2 family
   - Townhouse
   - Apartment / Multi – Family / (3 or more units)
   - Condominium
   - Manufactured home

2. How many levels does your home have, excluding the basement and unfinished attic?
   - 1
   - 2
   - 3

3. In what year was your home built?
   - Before 1959
   - 1960 – 1979
   - 1980 – 1989
   - 1990 – 1997
   - 1998 – 2000
   - 2001 – 2007
   - 2008

4. Does your home have an attic?
   - Yes
   - No

5. Does your home have a basement?
   - Yes, heated
   - Yes, unheated
   - No

6. Excluding bathrooms and hallways, how many rooms are in your home? *(include finished basement)*
   - 1
   - 2
   - 3
   - 4
   - 5
   - 6
   - 7
   - 8
   - 9
   - More than 9

7. How would you describe the size of the rooms in your home?
   - Above average
   - Average
   - Below average

8. Approximate size (heated area) of your home? Your answers to questions 6 & 7 above will allow us to estimate the size of your home in square feet. Or, if you know the square footage of your home, you may choose it here and we will use your input.
   - < 500
   - 500-999
   - 1000-1499
   - 1500-1999
   - 2000-2499
   - 2500-2999
   - 3000-3499
   - 3500-3999
   - 4000 or more
   - Don't know

MAIN HEATING SYSTEM

9. What is the fuel used in your primary heating system?
   - Electric
   - Natural Gas
   - Oil
   - Propane
   - Other (solar, wood, etc)
   - No heat system

10. Which of the following bests describes your home's primary heating system?
    - Electric Baseboard or ceiling cable
    - Forced air furnace
    - Standard heat pump
    - Ground source heat pump
    - Water boiler
    - Steam boiler
    - Wood heating system
    - Heat pump with gas backup
    - Heat pump with propane backup
    - Heat pump with oil backup
    - No heat system

11. How old is your heating system?
    - 0 – 4 years
    - 5 – 9 years
    - 10 – 14 years
    - 15 – 19 years
    - 20 years or greater

COOLING SYSTEM

12. Do you have a central cooling system? (If you use window or room air conditioners, you will note this in question 14)
    - No central cooling system
    - Central air conditioning
    - Heat Pump

13. If you have any cooling system, how old is it?
    - 0 – 4 years
    - 5 – 9 years
    - 10 – 14 years
    - 15 – 19 years
    - 20 years or greater

14. Do you use room or window air conditioners?
    - Yes
    - No

15. How many room or window A/Cs?
    - 1
    - 2
    - 3

16. If you have a central heating and cooling system with air ducts, are any of these ducts located in the attic?
    - Yes
    - No
    - Not applicable

Duke Energy.

Residential Energy Assessments

17. What is your thermostat setting for a typical heating day and a typical cooling day in the afternoon?

Heating
- <67 °
- 67 – 70 °F
- 71 – 73 °F
- 74 – 77 °F
- > 77 °F
- Thermostat off/ No thermostat

Cooling
- <69 °
- 69 – 72 °F
- 73 – 76 °F
- 77 – 78 °F
- > 78 °F
- Thermostat off/ No thermostat

18. Do you have any of the following comfort issues in your home?

a. *Cold drafts in the winter*
- Yes
- No

b. *Sweaty windows in the winter*
- Yes
- No

c. *Cooling system will not keep the home comfortable*
- Yes
- No

d. *Heating system will not keep the home comfortable*
- Yes
- No

e. *Uneven temperatures between rooms*
- Yes
- No

19. How many people live in your home?
- 1
- 2
- 3
- 4
- 5
- 6
- 7 or more

20. Do you own or rent this home?
- Own
- Rent

21. What fuel is used by your water heater?
- Electric
- Natural Gas
- Propane
- Other
- None

22. What is the age of your water heater?
- 0 – 4 years
- 5 – 9 years
- 10 – 14 years
- 15 – 19 years
- 20 years or greater

23. What type of fuel do you use for clothes drying?
- Electric
- Natural Gas
- Other
- None

24. What type of fuel do you use for your cook top?
- Electric
- Natural Gas
- Other
- None

25. What type of fuel do you use for your oven?
- Electric
- Natural Gas
- Other
- None

26. a. Do you have a swimming pool?
- Yes
- No

b. *Do you have a pool heater?*
- Yes
- No

c. *What type of fuel do you use to heat your pool?*
- Electric
- Natural Gas
- Oil
- Propane
- Not applicable

27. a. Do you have a hot tub?
- Yes
- No

b. *What type of fuel do you use to heat your hot tub?*
- Electric
- Natural Gas
- Oil
- Propane

28. Would a two degree increase in your home's indoor temperature during summer weekday afternoons affect your family's comfort?
- Not at all
- A small impact
- A moderate impact
- A large impact

29. Are you planning to make any large purchases to improve the energy efficiency of your home within the next three years?
- Yes
- No
- Not sure

30. How many CFLs* do you have installed in your home?

* 0 0 0 0 0 0 1 *

31. Please print your email address in the boxes below:

*compact fluorescent light bulbs

Residential Energy Assessments

PERSONALIZED ENERGY REPORT (PER)™

November 24, 2009



Dear Customer:

Thank you for joining thousands of households that have taken steps to save energy and money by requesting a **Personalized Energy Report (PER)™.** This report analyzes your past energy usage and evaluates your answers from the energy survey, to provide:

- A history and seasonal chart of your energy use
- A pie chart estimating how much energy is used
- A comparison of your energy use to similar homes
- Tips that help you save energy and money.

A copy of your report is also available online at www.duke-energy.com when you sign in to Online Services. When you sign in to manage your account, be sure to visit the Home Energy Center, where you will find a wide assortment of energy saving tips, tools and helpful charts.

Sincerely,

D. Welklin

Dan Welklin
Personalized Energy Report (PER)™ Manager

YOUR PERSONALIZED ENERGY REPORT (PER)™	
Prepared for	Mark Clinton
Account No.	00004321437
Date Prepared	November 24, 2009
Type of Home	SingleFamily
Home Size	1,750
Year Home Built	2001 - 2007
Space Heating Fuel	Propane
Water Heating Fuel	Electricity

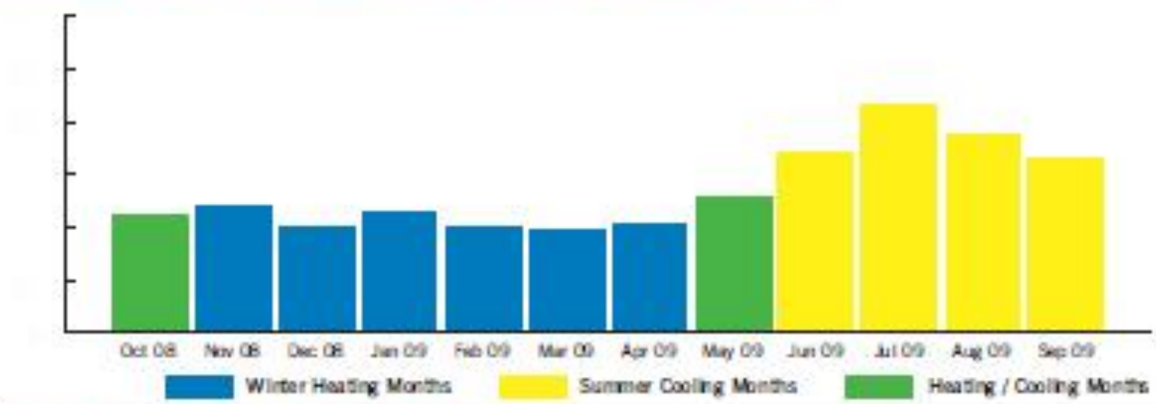
Residential Energy Assessments

YOUR MONTHLY ELECTRIC USAGE WITH AN APPROXIMATE ELECTRIC CHARGE*

OCTOBER 2008 - SEPTEMBER 2009		
Bill Month	Electricity Usage (kWh)	Approximate Bill*
Oct 08	915	$78
Nov 08	982	$84
Dec 08	827	$71
Jan 09	944	$81
Feb 09	820	$70
Mar 09	787	$67
Apr 09	848	$72
May 09	1,056	$90
Jun 09	1,397	$119
Jul 09	1,777	$152
Aug 09	1,532	$131
Sep 09	1,352	$115
Total	13,237	$1,129

*Important. Average energy rates are used in this report. The bill amounts in this table and following charts will not match your actual energy costs. For detailed information on your actual bills, visit "Energy Usage and Cost Details" in your Online Services account at www.duke-energy.com.

A SAMPLE OF YOUR HOME'S MONTH-TO-MONTH ELECTRIC USE*



* Note that your energy use can be impacted by seasonal weather.

KNOW YOUR BILL AMOUNT IN ADVANCE

The Equal Payment Plan is a free service that makes managing your budget easier by providing a predictable monthly bill. Equal Payment Plan covers all basic services. Additional services, such as outdoor lighting, are not included in the plan.

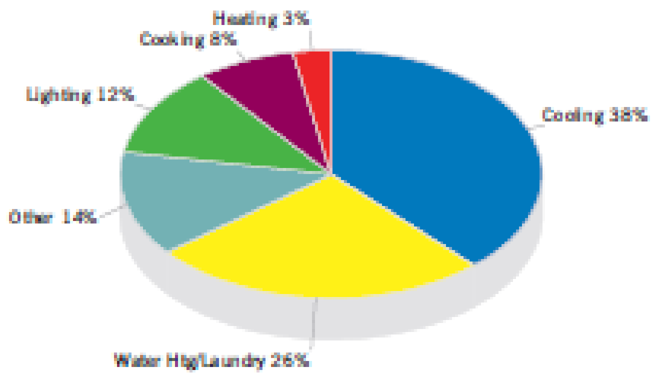
Your monthly bill is based on your previous year's electricity usage and is divided into 11 equal payments. It makes planning and budgeting your energy costs more accurate and convenient. All you need is an account with a record of good payment for the past 12 months.

To sign up or learn more, visit **www.duke-energy.com/south-carolina/billing/equal-payment.asp.**

Residential Energy Assessments

HOW YOUR HOUSEHOLD USES ELECTRICITY

2008-2009 ANNUAL COST BREAKDOWN	
Cooling	$431
Water Htg/Laundry	$294
Other	$154
Lighting	$131
Cooking	$86
Heating	$33
Total	**$1,129**



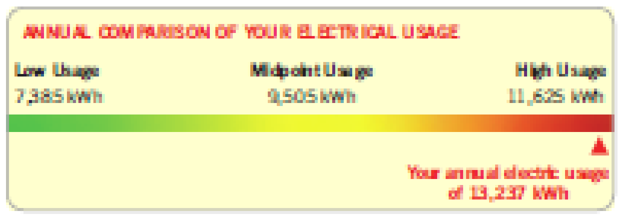
The dollar amounts and percentages in this pie chart are estimates based on inputs you provided on your survey. They are not based on actual measured readings from your home.

YOUR HOME'S ANNUAL ELECTRIC USAGE COMPARISON TO SIMILAR HOMES

The scale to the right shows you how your household's annual electric usage compares with the range of usage by similar households serviced by Duke Energy in South Carolina.

This comparison considers your home's fuel blend, the number of people in your family, and other information you provided in your questionnaire.

Using electricity wisely is good for the environment, saves you money, and may reduce the need to build more power plants in South Carolina. And that's good for everybody.



NO CHECKS, NO STAMPS, NO HASSLES

Automatic Monthly Payment is a free service that automatically pays your energy bill by withdrawing from your bank account on or after your payment date. There are no due dates to remember, checks to write or stamps to buy.

When you enroll, you select a payment date that is 10 to 14 days after your bill date. Enrolling is easy. All you need is a check or deposit slip from your bank and your Duke Energy account number.

To sign up or learn more, visit **www.duke-energy.com/south-carolina/payment/automatic-monthly.asp.**

Residential Energy Assessments

ENERGY SAVING TIPS FOR YOUR HOME

HEATING

In the winter, if you manually set your thermostat down to save money while you're gone, when you return, reset your thermostat to the normal temperature setting. Setting the thermostat really high won't help it heat up any faster.

When heating your home, try to minimize the number of times that doors to the outside are opened and closed; cold outside air enters your home each time you open the door.

The use of ceiling fans in the winter is most effective in rooms with very high ceilings, where warm air rises and collects above the living space. Normal rooms of 8 to 10 foot ceilings will see little benefit from fan usage.

If you've turned down your thermostat in the winter to save money, you may be uncomfortable in the evening hours when you are less active. For these short periods, consider using a portable heater to warm the room that you occupy instead of turning up the thermostat.

COOLING

In the summer, if you manually set your thermostat up to save money while you're gone, when you return, reset your thermostat to the normal temperature setting. Setting the thermostat really low won't help it cool down any faster.

In the summer, use the exhaust fans in your kitchen and baths to exhaust hot air and moisture. Both the heat and the humidity is an extra load on your air conditioner.

When air conditioning your home, try to minimize the number of times that doors to the outside are opened and closed; hot and humid outside air enters your home each time you open the door.

When air conditioning, avoid activities that add heat and humidity to your home during the hottest parts of the day. This includes cooking, bathing, clothes drying and dishwashing.

WATER HEATING & LAUNDRY

Don't overload the dryer. Overloading makes the dryer work harder and may cause excessive lint and wrinkling.

Dry loads consecutively to take advantage of heat build-up in your dryer.

Remove clothes as soon as they are dry. This not only saves energy but also helps to prevent wrinkling.

Your dishes should not need rinsing before putting them in the dishwasher, but if you do, use cold water instead of hot.

WEATHERIZATION

Heavy curtains or the use of window quilts will help reduce heat loss at night during the heating season. When the sun is shining, open the covering and allow the sun to help heat the room.

During the heating season, keep window shades open during the day to benefit from the heat of the sun. Close the window shades at night to keep the heat in.

LIGHTING

The money you spend on light bulbs is only 5-10 percent of your total lighting costs. The other 90-95 percent is the cost of electricity. Energy efficient compact fluorescent lights cost more to purchase, but only use about one fourth the energy to supply the same amount of light.

Take advantage of daylight whenever possible and turn off unneeded lighting. Fixtures with photocells and motion detectors are an excellent way to save on your lighting costs.

Use dimmers to control the amount of light you need. Dimming the lights to half the illumination cuts energy consumption roughly in half. (Note: For compact fluorescent lights, use only bulbs that are rated for use with dimmers.)

Look for the ENERGY STAR label on light bulbs and light fixtures. These models save energy, and money, and help the environment.

MISCELLANEOUS

If you are thinking about purchasing a new TV or VCR, look for ENERGY STAR models. These energy efficient models save money and help protect the environment by using less energy.

Computers and monitors qualify for an ENERGY STAR rating if they have a low energy "sleep" mode when not in use. If your computer has this feature make sure that it is enabled. Of course, you can save even more energy by turning these items off.

Screen savers, while effective in preserving the monitor, actually don't save energy. The best way to preserve the monitor and save energy is to turn it off.

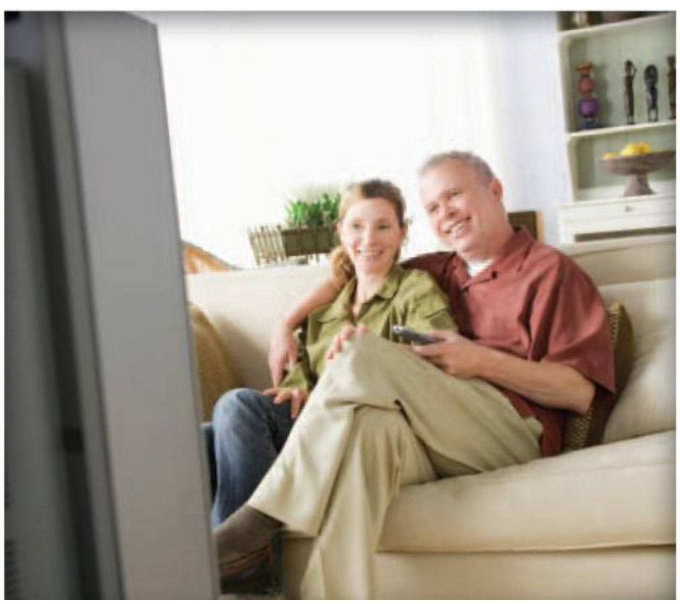
SACE 1st Response to Staff
012013 Duff Exhibit 6

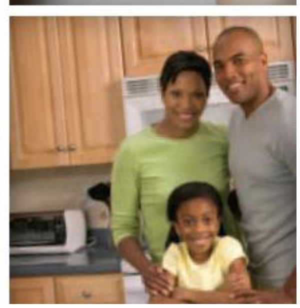
Residential Energy Assessments

HEHC Brochure

SAVE SOME GREEN
WITH A HOME ENERGY HOUSE CALL

Duke Energy®





Residential Energy Assessments

REDUCE YOUR ENERGY BILL

Home Energy House Call is a free in-home energy assessment designed to help you learn how your home uses energy and how you can save on your monthly bills. The program provides personalized information unique to your home and energy practices.

An energy specialist will visit your home to

- Pinpoint potential energy problems in your home at no cost to you
- Explain how to improve the heating and cooling comfort level of your home
- Help you preserve the environment for the future and keep electric costs low
- Provide you with a free Energy Efficiency Starter Kit

From the energy specialist's observations, a customized report is prepared detailing steps you can take to increase efficiency and reduce your energy bill.

RECEIVE FREE ENERGY SAVING ITEMS

As a part of your Home Energy House Call, you will receive a free Energy Efficiency Starter Kit. At your request, the energy specialist can install the efficiency items so that you can begin saving right away.

TO QUALIFY, YOU MUST

- Be a Duke Energy residential customer in North or South Carolina
- Have one of the following: electric heat, electric water heater or central air
- Own a single-family home and have lived there for at least four months (rental properties and mobile homes do not qualify)

START SAVING TODAY!

To sign up for your free Home Energy House Call, use one of the following methods

- Visit us online at www.duke-energy.com
- Call 1-877-388-7676 (toll free)
- Complete and return the postage-paid reply card

**Items in actual kit may differ slightly from those shown in photo.*

MAKE A DIFFERENCE

WORKING TOGETHER FOR A BETTER TOMORROW

By the year 2030, demand for electricity in the United States is expected to grow by approximately 25 percent, according to U.S. Department of Energy forecasts. In addition to developing nuclear and advanced cleaner-coal power plants, Duke Energy is leading the way by pursuing clean, renewable energy sources and helping you save energy through innovative efficiency programs. By carefully balancing all of these sources, we can meet our goal of providing you with reliable and affordable energy.

With energy efficiency programs such as Home Energy House Call, Duke Energy is helping you lower your energy consumption, and your energy savings helps us to meet the growing need for electricity. By participating in Home Energy House Call, you help preserve the environment, conserve energy and lower your bill.

Working together, we can reduce your energy consumption and contribute to a better tomorrow for all!

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO 1930 DULUTH MN

POSTAGE WILL BE PAID BY ADDRESSEE

ATTN HOME ENERGY HOUSE CALL
DUKE ENERGY
1 E 1ST ST STE 300
DULUTH MN 55802-9951

Residential Energy Assessments

SIGN UP TODAY

EXPERIENCE THE BENEFITS

TO QUALIFY, YOU MUST

- Be a Duke Energy residential customer in North or South Carolina
- Have one of the following: electric heat, electric water heater or central air
- Own a single-family home and have lived there for at least four months (rental properties and mobile homes do not qualify)

Name on Account ____________________

Address ____________________

City __________ State _____ Zip _____

Daytime Phone ____________________

Evening Phone ____________________

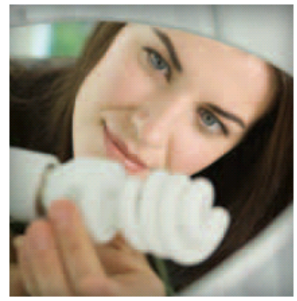
County of Residence ____________________

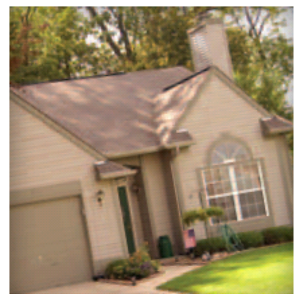
Account Number ____________________

VISIT WWW.DUKE-ENERGY.COM TO SIGN UP OR CALL 1-877-388-7676 (TOLL FREE) OR RETURN THIS CARD.

- A trained Energy Specialist will look for energy issues in your home at no cost to you
- Learn how you can improve your home and save energy with a customized report
- Improve the comfort of your home
- Receive a free Energy Efficiency Starter Kit
- Help preserve the environment for the future and keep electric costs low

080099 – Carolinas – Revised 5/09





Duke Energy®
EY573 / 139 East Fourth Street
Cincinnati, OH 45202

PRSRT STD
US POSTAGE
PAID
DUKE ENERGY

Carolinas

HEHC

Residential Energy Assessments

HEHC On-Site Report

HOME ENERGY HOUSE CALL ONSITE REPORT

Duke Energy.

Customer Name ______________________________

State ____________ Account # ____________________ Date ____________ Home Size ____________

1. Home shell insulation. Home insulation helps keep heated or air conditioned air from getting out of your home. Your home insulation needs: a) none, b) attic, c) wall cavity, d) basement wall insulation, e) floor insulation or insulation around the perimeter of the crawl space.

   ____

2. Home shell air tightness. Air leaks in your home allow conditioned air to escape and outside air to invade your home. Your home sealing needs: a) none, b) seal leaky windows c) seal leaky doors, d) seal leaky fireplace, e) seal leaky attic access, f) seal leaky plumbing, electrical, ceiling lights or other openings in shell, g) a major source of outside air infiltration was discovered and should be sealed.

   ____

3. Duct insulation. If your heating/cooling duct system is outside of your home's heated or cooled space, the ducts need to be well insulated to R-19. Your duct insulation needs: a) no action, b) attic duct insulation, c) garage duct insulation, d) crawl space or basement ducts or insulate perimeter walls and seal space.

   ____

4. Duct air tightness. Heating and cooling duct systems should be relatively airtight, especially if the duct system is not located in your home's heated or cooled space. Your duct sealing needs: a) no action b) attic ducts sealed, c) garage ducts sealed, d) a major duct repair is needed to seal your system.

   ____

5. Heat pump condition. An electric heat pump is very energy efficient. Your heat pump appears to be: a) high efficiency, b) an acceptable age and working, c) could not test heat pump to see if it is working, d) appears to be an acceptable age but may need to be serviced, e) appears to be old or you have no heat pump now. Installing a new heat pump will give you significant energy savings.

   ____

6. Furnace filter. A dirty furnace filter can reduce your heating and cooling efficiency. Your furnace filter: a) appears acceptable, b) needs attention. (Needs cleaned or replaced or the filter area needs repair.)

   ____

7. Crawl space vents. Your crawl space or basement vents should be closed during the winter heating season. Your home: a) has no crawl space, no crawl space vents or vents are always closed, b) consider closing vents in summer, c) close vents in winter, d) a significant crawl space or basement sealing repair is needed.

   ____

8. Summer window shading. Air conditioning costs can double if direct sunlight is not blocked. When air conditioning is on: a) window coverings are usually fully drawn or you have no air conditioning, b) window shades half drawn, c) shading rarely used, d) significant east/west, un-shaded solar exposure.

   ____

9. Furnace fan run time. Running your furnace fan all the time may increase your comfort, but it also adds to your electric bill. Your furnace fan is: a) you have no central fan b) ECM fan, c) always set to "auto" (cycling off and on) d) set to "auto" half the time and "on" half the time, e) always set to "on".

   ____

10. Hot water. Do not overheat your water. Today's laundry detergents allow for energy savings by using cold water for the wash and rinse cycles in your clothes washer. For your laundry: a) reduce your water heater temperature to 120 degrees, b) all washing and rinsing is in cold water, c) change wash loads from hot to warm or cold, d) change rinse loads from hot to cold.

    ____

11. Extra refrigerator. If your second refrigerator is not needed in all seasons, unplugging it or removing it will save you energy and money. In your home: a) you have only one refrigerator, b) consider unplugging your extra refrigerator.

    ____

080097 – Revised 10/08

Residential Smart Saver®

A. Description

Residential Smart Saver® Energy Efficient Program is an energy conservation program in North Carolina and South Carolina where incentives are paid to residential customers.

<u>CFLs</u>

The program is designed to offer incentives to customers and increase energy efficiency by installing CFLs in high use fixtures in the home. The incentives were offered in a variety of ways, including but not limited to "free" coupons, business reply cards (BRC) and IVR/WEB/OLS on-demand ordering tool. The new channels allowed us to increase impacts, encourage our customers to become more energy efficient and lowered program costs. The benefits include being

- easier for the customer to participate
- able to manage inventory demand
- able to simplify coordination for the program
- able to realize results on a quicker timeline.

1. **<u>GE/Walmart Coupon</u>** – Duke Energy (DE) mailed a "free" coupon to eligible residential customers redeemable at Walmart. The offer was for a six pack of GE Energy Smart CFLs.
2. **<u>BRC (Business Reply Card)</u>** – Duke Energy mailed a business reply card to eligible customers to "opt-in" and request a free 6 pack of CFLs to ship directly to their homes at no additional cost. Each BRC contains a unique barcode to track requests to a DE account number. Kits were fulfilled by a 3rd party vendor and results were available within weeks of the order.
3. **<u>IVR/WEB/OLS (CFL offer)</u>** – Duke Energy provided eligible customers three new channels to request free CFL to ship directly to their homes at no additional cost. Customers can choose the channel they prefer to request the bulbs.
    a. The IVR (Interactive Voice Response) consists of a toll free phone number for DE customers to use for account validation and to determine how many bulbs they are eligible to order. Customers acknowledge the order and DE processes the file to be fulfilled by a 3rd party vendor. The file will go directly to the vendor (processed daily) to speed up the ordering process.
    b. The WEB consists of screens that walk a customer through the CFL ordering process. Customers enter their account number and/or phone # plus last four digits of their SS # to check eligibility. Customers will see how many bulbs they qualify to order, they accept or decline the order, and proceed to check out.
    c. OLS (On line Services) customers (new and existing) will receive a "pop up" upon logging into OLS stating that they qualify for CFLs. They can choose to accept or decline. The same ordering process is identical to the WEB stated above. If an OLS customer declines upon logging into OLS, he / she will only see a "promo" box upon entering OLS during their next visit.

<u>HVAC and Heat Pump</u>

Incentives are paid to home builders, heating contractors and/or customers when high efficiency heat pumps or air conditioners are installed. The incentive is $300 per installation and is designed to increase the efficiency of HVAC systems in new homes and for replacements in existing homes.

Residential Smart Saver®

Duke Energy employs Wisconsin Energy Conservation Corporation (WECC) to promote and deliver several Duke Energy programs, including the Residential Smart Saver®. CustomerLink is another company that supports the program and is responsible for handling program related inquiries. WECC Representatives work closely with Trade Allies, such as heating contractors or builders, who are the direct interface with the residential customers. Once the home builder or customer decides to purchase a qualifying measure, an incentive application is prepared by the Trade Ally and sent to WECC. WECC receives and processes the incentive application from the trade ally and validates qualification. Once this is complete, they split incentive payments for existing homes are made by WECC to the heating dealer and customer. For new homes, the builder submits an application for a qualifying home and receives the entire $300.

Audience

CFL

Eligible customers are those Duke Energy Carolinas residential customers served on a Duke Energy residential rate schedule from the Company's retail distribution system. Duke Energy promoted each campaign through various marketing channels including direct mail, online advertising, bill insert, bill message, mass media, press release, Duke Energy Web site and other social media channels.

HVAC

Eligible customers are those Duke Energy Carolinas residential customers living in existing or building new owner-occupied residences, condominiums and mobile homes.

B & C. Impacts, Participants and Expenses

$ in millions	Filed (Annual)	Vintage 1	% of Target
NC Nominal Avoided Cost	$21.4	$117.7	550%
Program Costs	$5.8	$23.8	410%
Energy Impact (kW)	10,893	43,999	404%
Energy Impact (kWh)	79,662,163	466,455,566	586%
Units		7,815,114	

CFL

The Residential Smart Saver CFL program participation increased due to the new offers and distribution channels (e.g., GE/Walmart "free" Coupon, BRC, IVR/WEB/OLS online ordering tool). All eligible Duke Energy customers were targeted for the new CFL offers including Low Income customers. The new channels offered an easier way for Duke Energy customers to participate in Energy Efficiency programs. Response rates increased from 1.3% (traditional discounted coupons provided in 2009) to approximately 28% overall for new offers/channels in 2010.

Residential Smart Saver®

Campaign Results Take Rate

1. GE/Walmart coupon offer

[CONFIDENTIAL]

State	# of Coupons Mailed	Total Coupons Redeemed	% Take Rate	Cost Per Bulb (A)
NC	1,008,866	255,378	25.30%	[redacted]
SC	290,343	76,163	26.21%	[redacted]

2. Business Reply Card

[CONFIDENTIAL]

State	# of BRCs Mailed	Total BRCs Redeemed	% Take Rate	Cost Per Bulb (A)
NC	597,853	223,158	37.26%	[redacted]
SC	176,416	75,227	42.55%	[redacted]

3. IVR/WEB/OLS ordering tool

[CONFIDENTIAL]

State	Total Orders	Total Bulbs	Cost Per Bulb (A)
NC	217,260	2,860,570	[redacted]
SC	73,418	961,172	[redacted]

A) Cost Per Bulb data in italics is confidential

HVAC

Smart Saver Residential participation is higher than expected; however, as CFLs are the high volume measure of the Smart Saver program, the HVAC results are not easily identifiable in the numbers. We more than tripled our expected participation of 4,001 heat pumps and air conditioners in 2010 and realized participation of 14,594. Variance from the estimated budget, participation and impacts are a result of greater than expected acceptance of the program by customers and participating trade allies. Another contribution to this success is the work done by WECC trade ally representatives in signing up approximately 580 participating trade allies in 2010 and over 880 trade allies since program start up in June 2009.

Residential Smart Saver®

D. Qualitative Analysis

Highlights

CFL

Campaign success can be attributed to the no cost coupon offer by GE/Walmart and the new channels offering "free" CFLs delivered directly to the customer's home. The BRC and IVR/WEB channels allowed a "hassle-free" opportunity for customers to participate in the CFL programs without redeeming a coupon. Customers simply returned the postage paid BRC or utilized the IVR/WEB channels to opt-in for the CFLs. Inventory issues were eliminated by working with a 3rd party vendor to stock CFLs in advance to meet demand. One highlight for the new IVR/WEB/OLS channels is the ability for customers to check eligibility, order CFLs and track the status of their order; from requested date to delivery. The IVR/WEB/OLS channels allow Duke Energy to utilize low-cost, no-cost marketing channels to reach eligible customers who have not participated in traditional coupon offers. Total bulbs distributed through CFL campaigns exceeded 7.8 million bulbs in 2010.

HVAC

One of the most important attributes to our success is the incentive given to our heating contractor or to the sales representative. This incentive motivates the sales person to pursue the high efficiency sale at every opportunity. It is also a fair compensation for the amount of time the sales rep has in completing the incentive application for the customer. Customers do not have the technical information we are requesting on the application form, so we ask the trade ally to do this for the customer. Another very important highlight of the program is the ability of the WECC trade ally representatives to be able to sign up almost every heating contractor doing business in the Duke Service territory. To date we have over 880 participating trade allies signed up in North and South Carolina.

Issues

CFL

The GE/Walmart coupon offer was very successful and the response rate was higher than anticipated. Managing inventory to meet the high demand during the first phase of the coupon mailing was a challenge. Although coupon mailings were staggered over several weeks, some stores depleted their inventory which created a less than ideal customer experience. Duke Energy worked with GE and Walmart to quickly address the inventory issue. GE extended the expiration date of the coupon, offered substitute products, transferred inventory from other store locations and shipped additional products to meet demand. Addressing the inventory issues and extending the campaign expiration date allowed customers additional time to redeem coupons contributing to positive results.

Residential Smart Saver®

Potential Changes

CFL

1. **<u>IVR/WEB/OLS (CFL offer)</u>** – Duke Energy will continue to utilize the new channels to eligible customers requesting free CFLs to ship directly to their homes at no additional cost. We will utilize new marketing channels to reach eligible customers in the Carolinas.
   a. Additional marketing channels will consist of the following:
      i. Earned Media (Print, Press Release, TV, Radio)
      ii. Social Media (Twitter, Facebook, YouTube Video)
      iii. Duke Energy Web site (State Landing Pages, Portal Story, OLS Promo boxes, Opt-in E-mail)
      iv. Duke Energy Messaging Channels (Bill Messages, Bill Insert, Bill Envelopes)
      v. Print (Direct Mail piece, Event/Low Income Agency Postcard)

2. **<u>Property Manager</u>** – Duke Energy has selected Honeywell as the vendor to manage the distribution of CFLs to property managers. Honeywell will partner with NC and SC property managers to enroll multi-family complexes that will install CFLs. Duke Energy pays for the bulbs and the Property Manager pays for the shipping costs. The goal is to identify the number of units and permanent fixtures available with each apartment unit. Property Managers will install CFLs into the permanent fixture during their routine maintenance visits and provide tracking for each unit and the number of bulbs installed. Honeywell will validate and report the activity for each individual unit on the property.

HVAC

Program enhancements currently being considered include developing an electronic application submission process to allow for easier, quicker and more efficient submission of customer applications. Additional measures are currently being developed that are complimentary to the Smart Saver® HVAC program. The new services would further incentivize customers to increase their home's efficiency of through measures, such as attic insulation and air sealing, duct sealing, and HVAC tune ups.

E. Marketing Strategy

CFL

The overall strategy of this program is to reach residential Duke Energy customers who have not adopted CFLs, an easy and low cost way to become energy efficient without sacrificing comfort. We will continue to utilize new channels and educate customer on the benefits of CFLs while addressing barriers for consumers who have not purchased CFLs.

- The IVR/WEB CFL offer will use low/no cost channels to target DE customers. During the initial rollout, customers will hear about the offer through bill message, bill insert, e-mails Opt-in, internal employee communications; sponsorship programs/radio spots, tradeshow events and social media. As the program matures, additional channels will be utilized, such as, direct mail, e-mail and online advertising.

HVAC

This program is promoted by Duke, WECC and CustomerLink directly to HVAC contractors, builders and homeowners with aging equipment. All heating contractors and new home builders are encouraged to go to the Smart Saver® Web site and complete the Heating Dealer and Builder Sign up Form. All Participating Heating Dealers and Builders are included in an online list of participating trade allies.

The overall strategy for this program is to reach customers who are in need of an HVAC system and most importantly, to have our offer presented at the exact time a customer is deciding between a standard efficiency or high efficiency system. By keeping in very close contact with most all the significant trade allies in our service territory, we believe this program is being offered to nearly all customers who are making this decision. Program information is available to heating dealers, builders and customers via our Web site. It is also available in a brochure that is offered from many sources. The text of this brochure is attached at the end of this document.

F. Measurement and Verification

Evaluation, Measurement and Verification Schedule

CFL

Estimated 2011 Process Reporting	Estimated 2011 Impact Reporting	Estimated 2012 Process Reporting	Estimated 2012 Impact Reporting	Estimated 2013 Process Reporting	Estimated 2013 Impact Reporting
Q2	Q3	Q2	Q4	Q2	Q4

HVAC

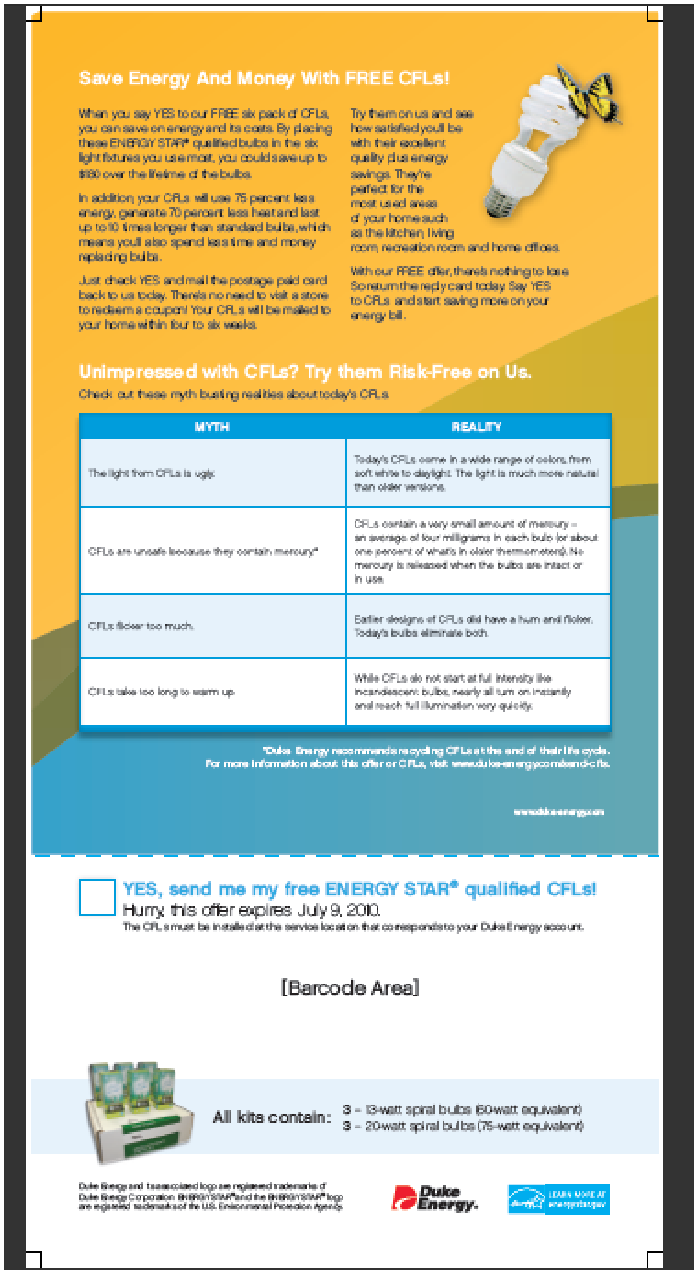
Estimated 2011 Process Reporting	Estimated 2011 Impact Reporting	Estimated 2012 Process Reporting	Estimated 2012 Impact Reporting	Estimated 2013 Process Reporting	Estimated 2013 Impact Reporting
Q2	Q3	Q2	Q4	Q3	Q4

Appendix

Residential Smart Saver®

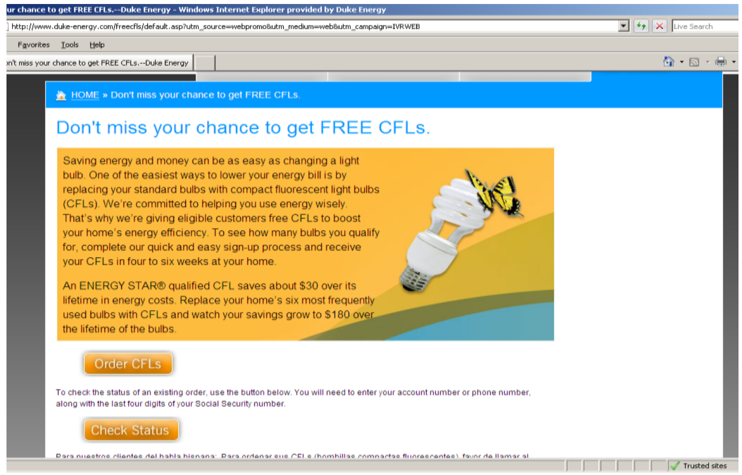
The coupon above is for the GE/Walmart CFL offer. The coupon was mailed to 1,008,866 customers in NC and 290,343 customers in SC. The campaign ran from March 3rd, 2010 thru July 15th, 2010. The offer was valid for a 'free' six pack of 13 Watt CFLs.

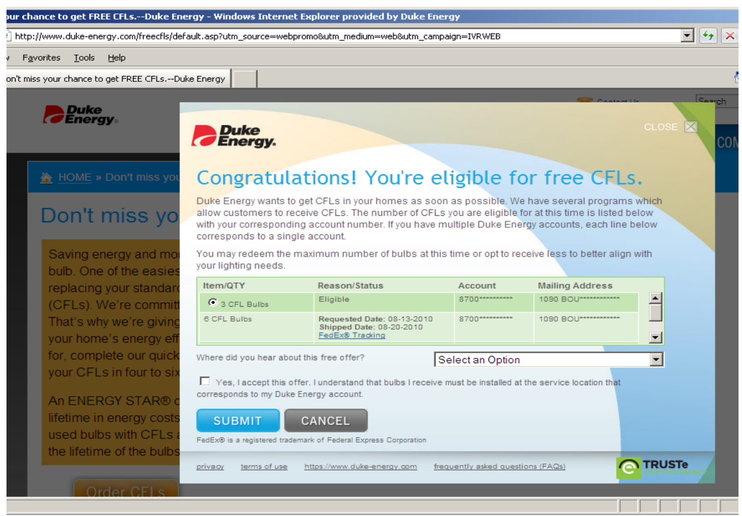
Residential Smart Saver®

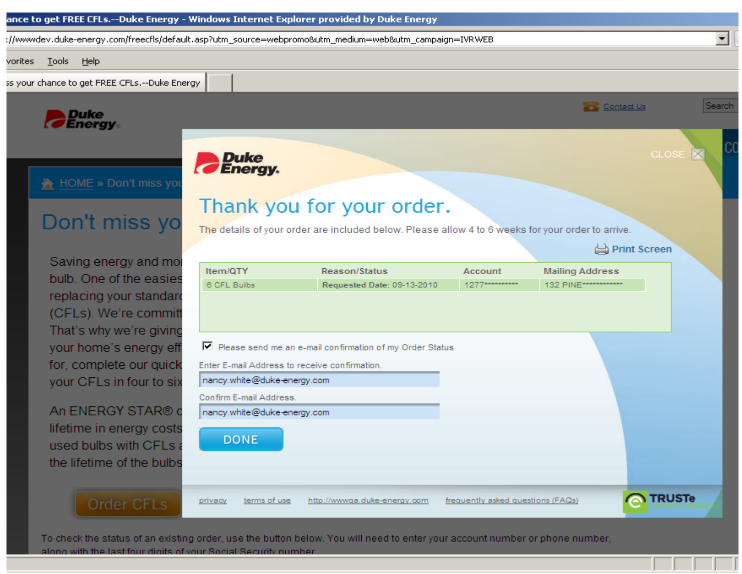


The Business Reply Card (BRC) was mailed to 597,853 customers in NC and 176,416 customers in SC. The campaign ran from June 1st thru July 16th, 2010. The offer was valid for six pack of CFLs (three - 13 watt and three - 20 Watt).

Residential Smart Saver®



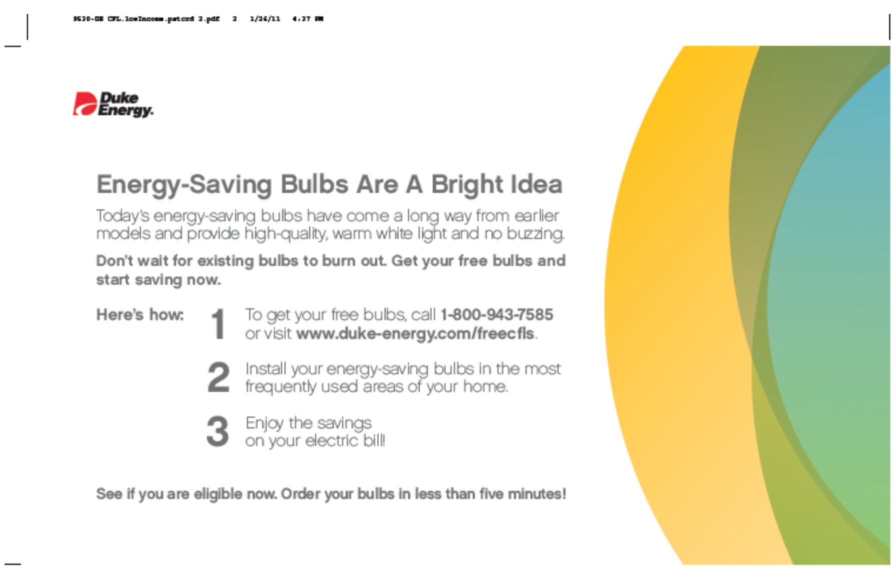




Residential Smart Saver®

IVR/Web/Online Services Tool

- An on-demand ordering and fulfillment capability
- Customers can check eligibility, place orders and track order status
- Officially launched on November 2nd in NC
- Total bulbs orders for NC 2,860,510; Total bulbs ordered in SC 961,172



**Above is the 'draft' of the Low Income/Event Postcard that will be distributed during 2011 for the IVR/WEB campaign.

Residential Smart Saver®

Brochure text for HVAC / Heat Pump:

RECEIVE A REBATE AND SAVE ON YOUR ENERGY BILL

SMART SAVER™ PROGRAM FOR EXISTING & NEW HOMES

Duke Energy encourages you to take advantage of our Smart Saver Program, which provides you an immediate rebate when you invest in a high efficiency heating or cooling system. And, with a high efficiency system, you'll experience savings on your home energy bills for years to come.

There are many new features in today's high efficiency heat pumps and air conditioners. This new technology will not only save you energy but it will also provide you greater comfort in your home.

By choosing a high efficiency system, you are helping to reduce our nation's need for energy, promote a clean environment and save valuable energy resources – now and in the future. You can find more information about Smart Saver, other energy efficiency programs, and ways to save energy and money at www.duke-energy.com/savings.

SMART SAVER REBATES*

You may qualify for a rebate in your existing home when you replace your heating and/or cooling system. New homes may also qualify when a new high efficiency heating and cooling system is selected. Choose a qualifying high efficiency air conditioner or heat pump listed in the chart below.

Type of high efficiency heating or cooling system	Rebate amount to customer in an existing home	Rebate amount to builder of a new home**
New 14 SEER or greater air conditioner with ECM fan	$200	$300
New 14 SEER or greater heat pump with ECM fan. Heat Pump HSPF must be an 8.2 or greater.	$200	$300
New 11.5 EER or greater geo thermal heat pump with ECM fan	$200	$300

* Rebates are paid for each qualifying system if more than one system is used in the home.

** For new homes, rebates are made to the builder unless the builder agrees that the customer will receive the rebate.

SMART SAVER FREQUENTLY ASKED QUESTIONS

How do I qualify for the Smart Saver rebates?

Smart Saver rebates are available for Duke Energy customers who purchase a new high efficiency heat pump or air conditioner. Heat pumps and air conditioners must also be equipped with a high efficiency fan motor (ECM). The qualifying efficiencies are listed in the rebate table above.

Why should I consider spending more on a high efficiency system?

Your new air conditioner or heat pump is an important investment for your home. You can expect this new system to last about 15 years and many systems last even longer. Investing in more efficient technology now will help keep your energy bills lower for years to come.

What is a SEER or EER?

Residential Smart Saver®

These are energy efficiency ratings to help consumers compare efficiency levels between all the available air conditioners and heat pumps. The higher the number, the less energy the system uses. The SEER or EER rating provided by your installer should be certified by the Air-Conditioning and Refrigeration Institute (ARI).

What is HSPF?

This is an energy efficiency rating for heat pumps. The higher the number, the less energy the system uses while heating your home.

What is an ECM fan?

Most all heating and cooling systems use a fan to distribute the heating or air conditioning to all the rooms in your home. This is also referred to as the blower. The type of fan motor should be considered in the total energy required to heat and cool your home, as it can be a considerable expense on your energy bill. Today's new efficient fan motors are referred to as "ECM", which stands for Electronically Commutative Motor. Many people simply refer to these new motors as a "variable speed fan" but the ECM specification is required. In addition to saving you money, this new technology is quieter than traditional fan motors and will increase your family's comfort in many ways. Ask your heating contractor for more details.

I do not have a heat pump now. Should I consider one?

Yes. When it's time to replace your central air conditioner, you can instead choose an add-on heat pump to significantly lower your monthly energy costs. In addition to providing energy efficient cooling in the summer, there is no heating technology that is more efficient than a heat pump during most winter temperatures. In a "dual-fuel" system, where an electric heat pump works in conjunction with a gas or oil furnace, the more efficient heat pump is used for 60% to 75% or more of your total heating load, and your furnace is used only on the coldest days.

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 979

In the Matter of	)	DIRECT TESTIMONY OF
Application of Duke Energy Carolinas	)	ASHLIE J. OSSEGE
LLC for Approval of Vintage 3 Rider EE	)	FOR
	)	DUKE ENERGY CAROLINAS, LLC

I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Ashlie J. Ossege and my business address is 139 East Fourth Street, Cincinnati, Ohio 45202.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed as Manager, Market Analytics for Duke Energy Business Services LLC ("Duke Energy Business Services"), a wholly-owned service company subsidiary of Duke Energy Corporation ("Duke Energy").

Q. PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL QUALIFICATIONS.

A. I have a Bachelor's degree from the University of Cincinnati in Marketing and Real Estate. I have completed additional coursework at the graduate level in Quantitative Analysis. I am an Instructor in the Graduate Economics department at the University of Cincinnati, teaching Applied Statistical Programming Methods for Economists.

From 1994 to 1997, I was employed by various real estate brokers, including Comey & Shepherd Realtors as a certified Realtor in Ohio. From 1997 to 2006, I worked for Cinergy and Duke Energy as a Lead Market Analyst developing and managing product/program design activities as well as market research projects. Since 2006, I have been employed by Duke Energy Business Services (formerly Duke Energy Shared Services, Inc.), currently in the role of Manager, Market Analytics supporting energy efficiency ("EE") analytics.

Q. PLEASE DESCRIBE YOUR DUTIES AS MANAGER, MARKET ANALYTICS

A. As Manager, Market Analytics, I have responsibilities for a variety of analytical functions in support of product development and operations, including managing impact and process evaluation studies, market research data collection and analysis, marketing design testing, energy load analysis, EE cost effectiveness analysis, and product design research. In this role, I provide Evaluation, Management and Verification ("EM&V") services for Duke Energy affiliates, including Duke Energy Carolinas, LLC ("Duke Energy Carolinas" or the "Company"), and have represented the Company on various national EM&V and energy consortiums.

Q. HAVE YOU PREVIOUSLY PROVIDED TESTIMONY BEFORE ANY OTHER REGULATORY AGENCIES?

A. Yes. I have presented testimony before the Indiana Utility Regulatory Commission in Cause No. 43955 and Cause No. 42693.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. My testimony supports Duke Energy Carolinas' Application to update its demand-side management ("DSM") and EE cost recovery rider, Rider EE, to incorporate the third vintage ("Vintage 3") of programs ("Rider 3"). In particular, my testimony: (1) provides an overview of Evaluation, Measurement, and Verification ("EM&V") process and activities; and (2) details the current findings from the Company's EM&V work.

Q. PLEASE DESCRIBE THE EXHIBITS ATTACHED TO YOUR TESTIMONY.

A. Ossege Exhibit 1 provides descriptions of the North Carolina EM&V activities to be conducted during the rate period, including their estimated costs and timeframe for completion. Ossege Exhibit 2 provides the same information but for the South Carolina EM&V activities. Ossege Exhibit 3 provides an overview of the Company's planned EM&V activities for 2012. Ossege Exhibit A provides the detailed EM&V report for

Residential Smart $aver CFLs. Ossege Exhibit B, on the other hand, shows the detailed Non-Residential Smart $aver EM&V results. Lastly, Ossege Exhibit C provides the analysis for the Non-Residential Smart $aver marketing approach known as Smart Buildings Advantage.

Q. WERE OSSEGE EXHIBITS 1, 2, 3, A, B, and C PREPARED BY YOU OR AT YOUR DIRECTION AND SUPERVISION?

A. Yes, they were.

II. OVERVIEW OF EVALUATION, MEASUREMENT, AND VERIFICATION

Q. WHAT IS EVALUATION, MEASUREMENT, AND VERIFICATION?

A. Evaluation, measurement and verification of EE programs, referred to as "EM&V," determines both program and measure impacts. Evaluation studies determine the impacts and effectiveness of EE programming from both the utility and customer perspective. Evaluation also allows the Company to refine and improve existing programs by analyzing feedback from customers. Measurement and verification activities, on the other hand, encompass the data collection, monitoring, and analysis associated with the calculation of gross energy and demand savings from individual sites or projects, and can be a subset of program evaluation. The data from measurement and verification is used to determine a program or measure's cost-effectiveness.

Q. WHY IS EM&V AN IMPORTANT COMPONENT OF ENERGY EFFICIENCY AND DEMAND SIDE MANAGEMENT?

A. As stated in Witness Schultz's testimony in Docket No. E-7, Sub 831 and the Agreement and Joint Stipulation of Settlement between Duke Energy Carolinas, the Public Staff, and Southern Alliance for Clean Energy, Environmental Defense Fund, Natural Resources Defense Council, and the Southern Environmental Law Center filed June 12, 2009 in the same Docket ("Settlement Agreement"), all programs will have EM&V performed in order to appropriately calculate the lost margins, avoided costs, and savings generated. Further, the Settlement Agreement established aggressive kWh and kW reduction goals for Duke Energy Carolinas to achieve, and EM&V is the mechanism to demonstrate the Company's progress towards meeting those goals. Duke Energy Carolinas also believes successful, reliable and cost-effective EE programs require EM&V activities for two primary reasons: First and foremost, reliably measuring savings achieved from EE provides certainty for resource planning and provides accountability to customers and shareholders. Second, properly executed evaluation activities support program improvements. Accurately understanding savings estimates and program efficacy enables Duke Energy Carolinas to drive increased energy savings through improved program design, including insights surrounding the targeting and marketing of specific programs to improve overall participation and how best to cost-effectively generate kW and kWh yield from the Company's EE investments.

Q. WHAT METHODOLOGY DOES THE COMPANY USE TO EVALUATE, MEASURE, AND VERIFY ENERGY EFFICIENCY PROGRAMS?

A. There are five types of evaluation that the Company relies upon. First, there is a cost-effectiveness evaluation, which requires establishing a set of assumptions around impacts and market potential before the program has been implemented.

Second, there is an impact evaluation, which strives to accurately estimate the actual energy and demand load reductions realized from a program through billing analysis, engineering analysis, or statistically adjusted engineering models. Third, the Company relies upon measurement activities performed after the program has been implemented to determine actual program results. Measurement typically refers to metering, sub-metering, hours-use logger meter, statistical pre- and post-analyses, or other methods of measuring load reduction. Measurement may often be a subset of an impact evaluation. Fourth, there is verification, which refers to the confirmation that customers actually installed the intended measures that vendors are performing to expectation and that other operational factors on the customer site are occurring such that the expected load savings are being realized. Finally, there are also process evaluations that refer to a set of review and auditing methods that ascertain program effectiveness, EE, customer satisfaction and experience, vendor satisfaction and other factors that contribute substantially to program success. These activities also help the Company understand which programs might not be as well understood or recognized by customers. Evaluating impacts carefully across different segments can contribute substantially to savings yields by helping product managers adjust their programs to better meet customer needs.

Q. HOW DOES DUKE ENERGY CAROLINAS PLAN TO MEASURE, MONITOR AND VERIFY THE PROGRAMS?

A. In general, the following approach will be used for measurement and verification of programs:

Paper and Electronic Verification: Paper or electronic verification will be completed on all applications for EE incentives by customers. As part of the application process, specific customer and measure data will be requested from applicants. Data requested will vary depending on the program, the measure, the equipment and the delivery of the application. Customers and/or contractors will be contacted for clarification and completion of the application if they fail to provide necessary information. Incentives will only be processed once verification is complete and information is entered into the electronic tracking systems. Verification information and all customer applications for incentives will be maintained by Duke Energy Carolinas.

Field Verification and Monitoring: Field verification and monitoring, in most cases, will occur on customer premises using randomly selected samples of approximately 5% of installations. On-site visits will verify the installation of the claimed equipment in the proper application, confirm appropriate contractor or vendor processes and performance, and bring to light potential discrepancies or process improvements for the programs. Sample size will be larger for very large projects with significant incentives or energy impacts at risk. The size of such samples will be commensurate with the increased load savings as determined by Duke Energy Carolinas. Field training and support will be given to auditors performing assessments, to ensure quality both for communications and technical capabilities.

Customer Satisfaction Surveys: Customer satisfaction surveys will be utilized to monitor satisfaction with program delivery and design, seek additional improvements to the program, and potentially uncover latent problems or issues with the measure/installation.

System Performance Tests: System performance tests for load control resources will be conducted periodically to ensure that operational systems are working correctly, and that the projected load reductions are reliably available when needed. Load research metering samples and tracking will also be used to verify energy reductions.

Early Feedback is an important element in EM&V for all components of process and impact evaluations. If a problem is found with EE-related installations or program operations, the contractor and customer will be notified for correction. In addition, subsequent work or projects performed by that contractor will be monitored until Duke Energy Carolinas is satisfied that the work is being completed according to program specifications and operational standards. If the problems are not resolved to the satisfaction of Duke Energy Carolinas, that contractor, at the Company's discretion, may be eliminated from the program.

Duke Energy Carolinas has provided for the independent review and evaluation of its proposed programs by establishing initial evaluation plan summaries that propose specific EE evaluation studies and activities that will be competitively bid, designed, managed, supervised or conducted by independent and qualified evaluation professionals.

Evaluation studies will generally include methods such as loggers to capture appliance usage times, load research metering for hourly load analysis, statistical pre- and post-billing analysis using comparison control groups, engineering analysis and modeling, reference and comparisons to impact studies conducted in other regions for similar programs, phone and online interviews, and other methods reviewed within the International Performance Measurement and Verification Protocols, the California Evaluation Framework, and the Model Energy Efficiency Program Impact Evaluation Guide prepared as part of the National Action Plan for Energy Efficiency.

Q. PLEASE DESCRIBE HOW ENERGY EFFICIENCY PROGRAMS AND MEASURES ARE ANALYZED FOR COST-EFFECTIVENESS.

A. EE measure analysis consists of determining the net present value of the financial stream of costs versus benefits, *i.e.*, the costs to implement the measures are valued against the savings or avoided costs. The resultant benefit/cost ratios, or tests, provide a summary of a measure's cost-effectiveness relative to the benefits of its projected load impacts. The Participant Test is the first screen for a program or measure to make sure a program makes economic sense for the individual consumer. Duke Energy Carolinas also uses the Utility Cost Test ("UCT"), the Total Resource Cost ("TRC") Test, and the Ratepayer Impact Measure ("RIM") Test for a comprehensive screening of EE measures.

- The Participant Test compares the benefits to the participant through bill savings and incentives from the utility, relative to the costs to the participant for implementing the EE measure. The costs can include incremental equipment and installation costs as well as increased annual operating cost, if applicable.
- The UCT compares utility benefits (avoided energy and capacity related costs) to utility costs incurred to implement the program such as marketing, customer incentives, and measure offset costs, and does not consider other benefits such as participant savings or societal impacts. This test compares the cost (to the utility) to implement the measures with the savings or avoided costs (to the utility) resulting from the change in magnitude and/or the pattern of electricity consumption caused by implementation of the program. Avoided costs are considered in the evaluation of cost-effectiveness based on the projected cost of power, including the projected cost of the utility's environmental compliance for known regulatory requirements. The cost-effectiveness analyses also incorporate avoided transmission and distribution costs, and load (line) losses.
- The TRC test compares the total benefits to the utility and to participants relative to the costs to the utility to implement the program along with the costs to the participant. The benefits to the utility are the same as those computed under the UCT. The benefits to the participant are the same as those computed under the Participant Test, however, customer incentives are considered to be a pass-through benefit to customers. As such, customer incentives or rebates are not included in the TRC though some precedent exists in other jurisdictions to consider non-energy benefits in this test.

- The RIM Test, or non-participants test, indicates if rates increase or decrease over the long-run as a result of implementing the program.

The use of multiple tests can ensure the development of a reasonable set of EE programs, indicate the likelihood that customers will participate, and also protect against cross-subsidization. It should also be noted that none of the tests described above include external benefits to participants and non-participants that can also offset the costs of the programs.

Q. HOW WILL THE EVALUATION, MEASUREMENT, AND VERIFICATION RESULTS BE UTILIZED IN DEVELOPING THE PROPOSED EE RIDER 3?

A. The EM&V process produces two important data sets used in the development of the rider: actual customer participation and load impacts. Actual customer participation from EM&V is incorporated into the Vintage 1 EMF portion of Rider 3 in order to reconcile any differences from estimated participation that may have occurred. The initial evaluation of program cost-effectiveness for Vintage 1 utilized projected numbers for participants and estimates of load impacts. EM&V is utilized to update those initial participation estimates with actual results for the purposes of the EMF. In addition to the EMF, actual participation and load impacts are utilized prospectively together to update estimates of future lost revenues and achievements for the Vintage 3 calculations in Rider 3. As shown in more detail in Witness McManeus' testimony, these EM&V impacts will be used prospectively to estimate lost revenues, to adjust future target achievement levels, to modify EE measure incentive costs. These results will also be utilized in future cost-effectiveness evaluations for each program and measure.

III. RESULTS FROM EM&V

Q. WHICH PROGRAMS OR MEASURES HAVE COMPLETED THEIR EM&V?

A. The process and impact evaluation study for Carolinas-based residential CFLs (as part of the Residential Smart $aver® Programs) is finished and included as Ossege Exhibit A. Likewise, the Company has received the Carolinas-based non-residential lighting EM&V process and impact evaluation reports (as part of the Non-Residential Smart $aver® Program). It is attached as Ossege Exhibit B.

Q. HAS THE COMPANY EVALUATED ANY MARKETING APPROACHES FOR EE PROGRAMS?

A. Yes. Duke Energy Carolinas' also evaluated the Smart Buildings Advantage ("SBA") marketing approach for the Company's Non-Residential Smart $aver Custom and Prescriptive programs. The results from this evaluation are included in Ossege Exhibit C.

Q. WHAT WERE THE LOAD IMPACTS FROM THE EM&V AND HOW DO THEY COMPARE TO THE COMPANY'S ORIGINAL ESTIMATES?

A. Load impacts came from lighting-related measures in both the Residential and Non-Residential Smart $aver programs. Within Residential Smart $aver, CFLs were the only lighting measure offered. Based on the EM&V, gross energy savings per CFL bulb were adjusted from 64 kWh to 42.6 kWh (net[1] energy savings per bulb were modified from 58.75 kWh to 49.19 kWh), reducing the recognized impacts by approximately 30%. This modification was driven by changes to the customer's hours of CFL bulb use , average room type where a bulb was installed, bulb mix per room, and average bulb installation rate. The coincident kW had a minor adjustment from 0.0054 kW to 0.0052 kW, contributing to a small reduction to recognized impacts. Data collection for this EM&V

[1] Net adjustments include free-ridership, spillover, and line losses.

included logging Carolinas-specific hours of use for a more accurate reflection of bulb use.

Load impacts for lighting measures from Non-Residential Smart $aver were also updated. When compared to original estimates, actual measured energy and demand savings realization rates for high-bay lighting measures were very close to 1.0, indicating the program planning estimates currently provide a good indication of average high-bay lighting participant savings. Thus, impacts from these measures were not greatly modified from their original estimates. Specific impacts by measure can be found in Ossege Exhibit B.

Q. WHICH PROGRAM EVALUATIONS ARE CURRENTLY IN PROGRESS AND WHAT ARE THEIR ESTIMATED COMPLETION DATES?

A. The following program evaluations are in-progress. Included in the parenthesis by each program are the estimated dates in 2011 when the Company expects for them to be completed:

- Power Manager (Second Quarter 2011)
- Residential Smart $aver® (Second/Third Quarter 2011)
- Residential Energy Assessments (Second Quarter 2011)
  - Personalized Energy Report®
  - Online Services
  - Home Energy House Call
- Energy Efficiency Education Program for Schools (Second/Third Quarter 2011)
- Low Income Energy Efficiency & Weatherization Assistance Program (Fourth Quarter 2011)

- PowerShare® (Second/Third Quarter 2011)
- Non-Residential Energy Assessments (Second Quarter 2011)
- Residential Retrofit (pilot program South Carolina) (Second Quarter 2011)
- Home Energy Comparison Report (pilot program in South Carolina) (Second/Third Quarter 2011)
- Non-Residential Smart $aver
  - Non-Residential Smart $aver Custom (Second/Fourth Quarter)
  - Non-Residential Smart $aver Prescriptive (Second/Fourth Quarter)

Q. WHICH PILOT PROGRAM EVALUATIONS ARE PLANNED FOR 2012?

A. EM&V studies of Duke Energy Carolina's Smart Energy Now pilot program and Home Energy Comparison Report are planned for 2012.

Q. ARE THERE ANY OTHER NON-ENERGY BENEFITS FROM THESE PROGRAMS?

A. While, theoretically, EE programs may provide some non-energy benefits such as lower bad debt write-off, reduced carrying costs on arrearages; require fewer notices and customer calls, need fewer shutoffs and reconnections for delinquencies, and increase homeowners' insurance savings, these savings are extremely difficult to quantify. For example, stripping out the effects of weather, changes in capital structure, and general economic activity from changes in the Company's carrying costs on arrearages due to EE would provide numerous technical and quantitative challenges. Furthermore, some non-energy savings may require extensive data collection in order to calculate possible EE-related results. Also, Transmission and Distribution Losses are measured periodically and already incorporated into base rates as appropriate. Lastly, some data collection activities necessary to determine non-energy savings may raise customer privacy concerns, do not accrue directly to Duke Energy Carolinas, or would prove difficult to implement (e.g. determining homeowners' insurance savings).

Although these impacts cannot be specifically identified or are very difficult to obtain, this does not mean they will not be captured. Instead, many of these results will be determined in the course of a general rate case. Therefore, due to the problems associated with capturing the necessary data, the best place to address possible non-energy benefits is through the Company's general rate case rather than this energy efficiency proceeding.

Q. HAVE PARTICIPANTS IN THE ENERGY EFFICIENCY EDUCATION PROGRAM FOR SCHOOLS INCLUDED STUDENTS WHO ARE NOT CUSTOMERS OF DUKE ENERGY CAROLINAS?

A. Yes. Duke Energy Carolinas serves various elementary, middle, and high schools where student households may or may not be customers of the Company. Some impacts from this program may therefore occur in student households outside of Duke Energy Carolinas' service territory. The EM&V study for this program will therefore delineate impact results for Duke Energy Carolinas customers from non-customers. The results for non-Duke Energy Carolinas customers will be provided in the report for informational purposes only because the Company feels it is important to recognize all of the impacts its EE programs have had on the Carolinas. Yet, Duke Energy Carolinas will not use impacts from non-Duke Energy Carolinas customers to calculate the impacts, avoided costs, or net lost revenues from the Energy Efficiency Education Program For Schools.

Q. **DESCRIBE THE FREE RIDERSHIP RESULTS OBSERVED BY THE COMPANY'S EM&V FROM INSTALLATION OF CFLS BY RESIDENTIAL CUSTOMERS?**

A. Duke Energy Carolinas uses an internal tracking system for monitoring customer installations of CFLs. This tracking system is supported through bar-coded coupons and survey results to directly tie shipped CFLs to households. It allows the Company to indirectly manage free-ridership, by marketing to customers that may not already be pre-disposed to CFLs. In addition, through the residential CFL-related programs, Duke Energy Carolinas has incorporated multiple marketing channels to reach diverse markets, including, but not limited to, convenience-driven customers and renters. These marketing channels include discount coupons, business reply cards, free CFLs sent to homes or redeemed in retail locations, and to renters via their property managers. With a variety of marketing channels, the Company directly impacts adoption and education around CFLs. In fact, this activity led to significant "spillover," spurring the adoption of additional EE CFLs and other measures beyond what was initially supplied by the Company. Spillover is calculated as part of the EM&V process and can reduce or eliminate the effects of free-ridership. Because this measure produced significant spillover, the latest EM&V results show free ridership was essentially equal to spillover so that the net effects of the measures were improved. This result is not unusual in that it has also been seen in other states that measure spillover, such as New York within NYSERDA's programs and in the Pacific Northwest within the NWEEA's programs, and in Wisconsin.

IV. <u>LOST REVENUES</u>

Q. PLEASE EXPLAIN HOW THE ENERGY AND CAPACITY REDUCTIONS FOR THE NET LOST REVENUE CALCULATIONS WERE CALCULATED.

A. Based on the available EM&V analysis, the Company ran the DSMore model in order to calculate the kWh and kW reductions associated with net lost revenues. These results were then provided to Witness McManeus in order for her to determine the Company's net lost revenues. Energy and capacity associated with net lost revenues for Vintage 3 were calculated beginning January 1, 2012 and ending December 31, 2012 using rates in effect as of the beginning of 2011.

V. CONCLUSION

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes.

Duke Energy Residential Smart $aver® CFL Program in North Carolina and South Carolina

Results of a Process and Impact Evaluation

Prepared for

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139 East Fourth Street
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February 15, 2011

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Table of Contents

Executive Summary

This report presents the findings of the Residential Smart $aver® Compact Fluorescent Lightbulb (CFL) Program for Duke Energy from September 2009 through July 2010. Two campaigns took place during this time:

1. Campaign 556 was four manufacturer's coupons redeemable at any store for 2 GE Energy Smart 2-packs. (September 10th, 2009 – December 31st, 2009)
2. Campaign 617 was a manufacturer's coupon redeemable at Wal-Mart for a free GE 6-pack. (March 3rd, 2010 – July 15th, 2010)

Both of these campaigns featuring mailed coupons. This report reviews the program's customer satisfaction, demographics, CFL use, and the energy savings from the CFLs purchased through the program. The evaluation is separated into the two components: a process evaluation and an energy impact analysis: To support this a coupon redeemer survey was conducted. In addition, interviews were conducted of Duke Energy's program manager, CFL bulb retailers, and manufacturers that offered CFL coupons. Finally, for the impact evaluation, a lighting logger study was conducted with customers who redeemed CFL coupons to estimate lighting usage in their home.

Methodology

To conduct the energy impact analysis this study combined the information from two data collection approaches that together allowed the estimation of saved energy. In addition, this study conducted interviews with the program manager and retail store managers that when combined with customer surveys allowed for the assessment of the operations of the program.

The kilowatt hour savings were calculated using the data obtained from the lighting logger study performed on homes in the targeted areas served by the program, which provided average hours of use for each room type in which the CFLs were installed. These values were used to inform the customer responses to the CFL coupon redeemer survey which indicated the room type, wattage of lamp installed, wattage of lamp replaced, and customer-estimated hours of use.

A coupon redeemer survey was sent to customers who redeemed Duke Energy coupons for CFL bulbs. The coupon redeemer survey asked customers to provide information regarding their purchase of CFL bulbs, their experience with CFL bulbs, and their satisfaction with CFL bulbs. The survey can be found in the appendices of this report.

Program operations were evaluated through an in-depth interview with two program managers and five retail store managers.

Summary of Findings

An overview of the key findings and recommendations identified through this evaluation is presented below.

Findings

1. Duke Energy's CFL coupons are very popular with retailers, boosting sales 500 to 1,000 percent over typical sales, in some cases causing stores to move product from non-Duke Energy territories, providing substitutions and extending expiration dates for offers. This is a substantial increase in sales and reflects well on Duke Energy and on their marketing efforts and promotional initiatives. Duke Energy managers report large movements of CFLs in all Duke Energy territory stores carrying the GE brand with retailers reporting sales as fast as they can stock the covered bulbs.

2. Discount coupons are recently experiencing diminishing returns as far as reaching new customers to redeem the price reduction the coupons. Strategies are now being implemented to reach non-coupon users. Additional targeting and motivational appeals at younger and more mobile customers who are less likely to redeem coupons is needed if the use of discount coupons is maintained to increase redemption from this group. However, Duke Energy has moved to a no cost coupon for a free 6 pack of CFLs that has increased sales of CFLs to the point where the market is having trouble stocking bulbs and retailers are asking for advance notice of coupon distribution to enable them to have enough stock in the stores. Duke Energy managers report that redemption rates are running between 20% and 25% compared to about 3% with the price reduction coupons.

3. The strategy of using individual customer-coded coupons allows Duke Energy to focus on accurately tracking customer purchases rather than reconciling participation and sales counts with retailers. The move to customer-specific coupons also allow Duke Energy to move away from a store-focus program to a customer-targeted program, a more efficient method of operation that can expand and contract as needed by including or not including customers in direct mail targeting. The method also allows for strategic geo-expansion of the program by targeting more areas rather than increasing coordination with specific stores. This also allows Duke Energy the flexibility of moving between a discount coupon and a free bulb coupon to match the energy and cost effectiveness goals. This method has also allowed Duke Energy to identify a few (less than 10) customers who have copied the coupon in order to obtain more than the maximum number of free bulbs.

4. Home Depot (for example) did not carry the partnered brand resulting in a large CFL retailer not being allowed to participate in the program. The manufacturers' coupon was successful in acquiring cooperation with other specific retailers, such as an expansion into Wal-Mart. Since the coupon campaign, Duke Energy has also allowed customers to acquire the CFLs over the web if they cannot or are unable to go to one of the retail outlets, increasing exposure and adoption rates. In the web process Duke Energy can validate the potential participant's status as a Duke Energy customer and verify that they are eligible for the CFLs. This allows Duke Energy to mail only the number of bulbs that the customer is eligible to receive (up to 15 bulbs) by using a real-time database verification to see if they have redeemed a coupon in the past.

5. Retailers report that the coupons significantly affect sales and a discontinuation of the program would result in much fewer CFLs purchased as well as a significantly lower focus on CFL sales by the retailer.

6. Retailers report they need additional lead time to acquire additional stock because of the higher sales volumes that have occurred after Duke Energy's coupons were distributed. This is a problem growing out of the success of the effort. That is, the effort was successful enough that the retailers report needing extra time to obtain inventory from their non-Duke Energy territory stores to support the increased sales. Also, because of the increased demand and the strong customer acceptance, retailers report that coupons should have longer duration periods to allow them to not expire so quickly and allow participants more time to redeem their coupons. GE reported sending out 1.5 million postcards to Duke Energy's customers to let them know that they could still redeem their coupons after the expiration date to compensate for lack of stock. To be fair to Duke Energy, it should be noted that the program had advised retailers to stock more bulbs than they would have normally needed. However, few of the retailers took this action.

7. CFL coupons were far and away the primary driver for participants to purchase CFLs, and more than 40 % of coupon redeemers indicated that they would have purchased zero CFLs if the Duke Energy coupon had not been available.

8. While CFL coupons are driving spillover to more CFL purchases, the coupons are having only a small effect on simultaneous purchases of other energy efficiency technologies such as insulation and weather stripping.

9. Of the CFLs redeemed with coupons, 90% in North Carolina and 84% in South Carolina were reported to be installed and operating in sockets at the time of the survey.

10. Prior use of CFLs had no bearing on CFL program satisfaction ratings of CFL redeemers or self-reported likelihood of redeemers purchasing CFLs in the future, however those redeemers who experienced any bulb failure or removed at least one CFL because of light quality had a lower overall satisfaction rating with CFLs.

11. Prior use did have an effect on forward-looking confidence in CFLs with more new adopters than previous adopters finding they were much more confident in CFLs after participating in the program.

12. CFL forward-looking buying and installation habits are similar for new and previous adopters

Energy Savings Summary

Gross Energy Savings Calculations

Past evaluations have indicated that self-reported hours of use tend to over-estimate estimated savings by over-estimating typical hours of use. As a result, in order to reliably estimate energy impacts, it was necessary to use the results of the logger study that recorded the actual hours of use. This allowed the impact estimate to be based on the measured hours of use, times the difference in wattage between the lamp replaced and the lamp installed, as reported by the participants. From this calculation there is a gross yearly energy savings of 46.9 kWh per lamp in North Carolina and 40.3 kWh per lamp in South Carolina.

Free Riders and Free Drivers

From the survey results, it was determined that 19% of CFL purchases made were due to free riders[1], while 32% of purchases made were due to free drivers[2] for a net-to-gross adjustment factor of 107% excluding additional market effects caused by the program beyond the participant purchases[3].

Total Program Net Energy Savings Calculations

Program impacts are presented in the Impact Evaluation Summary Table below.

Table 1. Impact Evaluation Summary Table

Metric		North Carolina	South Carolina
Total lamps redeemed		1,619,990	490,670
ISR		0.9053	0.9102
Gross kWh per lamp redeemed		42.4265	36.6900
Gross kW per lamp redeemed		0.0445513	0.0378810
Coincidence Factor		0.123	0.123
Gross Coincident kW per lamp redeemed		0.0055	0.0047
Total Gross Program MWh Savings		68,731	18,003
Total Gross Program kW Savings		72,173	18,587
Total Gross Program Coincident kW Savings		8,877	2,286
Free rider adjustment		0.81	0.81
Spillover adjustment		1.32	1.32
Net to gross ratio including spillover		1.07	1.07
Total Net Program MWh Savings (free riders only)		55,672	14,582
Total Net Program kW Savings (free riders only)		58,460	15,056
Total Net Program Coincident kW Savings (free riders only)		7,191	1,852
Net kWh per lamp redeemed (free riders only)	(A)	34.37	29.72
Net kW per lamp redeemed (free riders only)		0.0361	0.0307
Net Coincident kW per lamp redeemed (free riders only)		0.0044	0.0038
Total Net Program MWh Savings (free riders plus spillover)		73,542	19,263
Total Net Program kW Savings (free riders plus spillover)		77,225	19,888
Total Net Program Coincident kW Savings (free riders plus spillover)		9,499	2,446
Net kWh per lamp redeemed (free riders plus spillover)	(B)	45.40	39.26

[1] Free rider: someone who would have taken the same action without the program's influence.
[2] Free driver: someone who takes additional actions as a result of the influence of the program.
[3] As retailers focus on stocking and displaying more CFL products as a result of the program's marketing push, additional sales are generated by non-participating shoppers. This study excludes the savings acquired by non-participating customers as a result of the way in which the program influenced total CFL sales.

Net kW per lamp redeemed (free riders plus spillover)	0.0477	0.0405
Net Coincident kW per lamp redeemed (free riders plus spillover)	0.0059	0.0050
Measure life	5	5
Lifetime net MWh savings (free riders only)	278,359	72,911
Lifetime net MWh savings (free riders plus spillover)	367,708	96,314

(A): Net kWh per lamp redeemed, for the free riders only, is calculated using the total net program MWh savings (free riders only) divided by the total lamps redeemed.
(B): Net kWh per lamp redeemed, including both free riders and spillover, is calculated using the total net program MWh savings (free riders plus spillover) divided by the total lamps redeemed.

* While the advertised expected life of the installed CFLs is greater (10 years), recent research in California has indicated that CFL bulbs installed in typical rooms have switching behaviors that erode about half the advertized effective useful life. The adjustment approach for reducing the effective useful life to 5 years is presented in Appendix E: Effective Useful Life Adjustment Factor for Installed CFLs.

Recommendations

TecMarket Works and Building Metrics offer the following recommendations for the Smart $aver® CFL Program.

1. Consider conducting light logger studies at different times of the year to observe the daylength effect. Doing the logging studies over the equinox removes the daylength effect from the logger data. However, if Duke Energy would like to study the magnitude of the daylength effect, the evaluation team will need to design an experiment that would require logging at different times of the year. Doing so will involve much larger samples and a longer timeframe than what was needed for this or previous studies, so this should be considered carefully given the budget and timeline expansions needed if Duke Energy would like to explore this effect in future evaluations.

2. Link light logger installations unambiguously to self-reported hours of use data.

3. Continue use of targeted marketing efforts to identify customers most likely to purchase CFLs during the specific promotion or campaign. 2008 targeted messaging analysis shows that targeting messages to customers based on likelihood of adoption is successful in providing lift to populations that were not as likely to purchase CFLs. (Note: during the drafting of this report Duke Energy has continued testing motivational message content and redemption rates and reports that they have narrowed the messaging to energy and environmental appeals that experience the higher adoption and redemption rates and have moved to the use of free product coupons that together are substantially increasing redemption rates for CFLs.)

4. Savings for typical CFL bulbs may decrease over the long term as more customers adopt CFLs and continue to install bulbs in lower use sockets and fixtures. Recognizing the need to cost-effectively distribute CFLs, Duke Energy designed a tracking system to mitigate over-distribution of traditional CFLs. Consider transitioning the CFL program to incorporate other types of CFL offers, such as specialty bulbs (candelabras, torchieres, outdoor, etc.), LEDs, and other emerging technologies as they become cost effective. (Evaluation Review Follow-Up Note: Duke Energy reports that they are currently examining the inclusion of specialty bulbs to understand their potential with both past CFL redeemers and previous purchasers of CFLs as well as approaches for reaching new customers with specialty bulb appeals and offers. In addition, TecMarket Works is currently assessing the market for CFLs and will address the potential for specialty bulbs in the CFL potentials report to be delivered in April 2011. Duke Energy also reports that CFL adoption has increased due to offering web and phone-based ordering platforms where CFLs can be shipped directly to the customer's home as soon as they are ordered. Duke Energy customers can check eligibility and request CFLs by accessing a unique URL or OLS (Online Services) or by calling a toll-free number.

5. Consider incorporating a market effects study to identify ways to transition the program moving forward as traditional incandescents are phased out in the coming years, as shown in Table 2 below.

Table 2. EISA Schedule for General Service Incandescent[4]

Current Wattage	Rated Lumen Ranges	Maximum Rated Wattage	Minimum Rated Lifetime	Effective Date (Manufactured on or after)
100	1490-2600	72	1,000 hours	1/1/2012
75	1050-1489	53	1,000 hours	1/1/2013
60	750-1049	43	1,000 hours	1/1/2014
40	310-749	29	1,000 hours	1/1/2014

6. Consider coupling CFL efforts with other energy saving measures and/or programs. Customers did not buy many other energy efficiency items in addition to the CFLs when making their CFL purchases. Program managers could leverage both redeemer and non redeemers' awareness of ENERGY STAR to incorporate other energy saving items and/or encourage customers take other energy saving actions at the same time they are purchasing CFLs. Coupon redeemers purchased other energy saving measures (caulking, weather stripping, low-flow showerhead) in small quantities and might be interested in other simple energy saving measures if they were co-marketed with a CFL offer. Both redeemers and non redeemers may be interested in such measures as ENERGY STAR appliances, or other Duke Energy programs offering energy efficient measures such as HVAC or home audits. (Evaluation Review Follow-Up Note: Duke Energy reports that they have already started coordinating program services to include multi-product appeals and exposure in their small business programs, the Home Energy House Call program, neighborhood canvassing, and are considering other programs that can act as aggregation efforts to expose customers to multiple measures.)

7. Non coupon redeemers are generally not influenced by receiving Duke Energy coupons to purchase CFLs elsewhere, however, the price of CFLs is a factor for these customers. Consider additional marketing strategies for these customers that incorporate the Duke Energy reduced price of CFLs, recommendations of friends and family, and other types of advertising appeals. These customers were more influenced by in-store advertising than the coupon redeemers, so other types of offers for CFL savings, such as point of purchase offers, may appeal to these customers. (Evaluation Review Follow-Up Note: Duke Energy reports that they have started these efforts with property management programs, business reply cards and web campaigns.)

[4] Source: http://www1.eere.energy.gov/buildings/appliance_standards/residential/pdfs/lighting_legislation_fact_sheet_03_13_08.pdf

Process Evaluation

Program Design and Operations

The overall design of the program as related by program managers is to encourage people to start thinking in terms of energy efficiency in their homes and not necessarily to push CFLs specifically. CFLs are not seen as a long-term program offering but instead serve as a bridge to emerging technologies like LEDs and potentially high efficiency incandescent bulbs. Program managers also view the CFL offering as a high profile entry point for informing customers of other energy efficient technologies that are currently available through Duke Energy's programs such as programmable thermostats, high efficiency appliances, etc.

Program manager noted that while savings are measured at the bulb level, the program focuses on customers and the number of customers that can be cost effectively reached for the typical number of bulbs per participating customer. Managers report that the program is not an attempt at marketing CFLs to the point of socket saturation, but is an attempt to raise awareness of energy efficient products and behaviors via a focus on CFLs.

The customer incentive (value of the coupon) is delivered using direct-mail manufacturers' coupons partnering with GE, and for a period prior to the completion the program partnered with Lowe's and offered coupons for *BrightEffects* bulbs. Originally the program partnered with individual retailers.

The program is very popular with retailers. Neither of the retail partners interviewed could identify a component of the program or the approach used that is in need of improvement and indicated that their sales are very positively affected by the coupons.

Program managers however, suggest that there is room for expansion in CFL sales because of the number of sockets still filled with incandescent bulbs and the potential for expanded adoption of the technology. Managers report concern that with the changes in the federal standard, the window for CFLs as a program-pushed technology is not more than two years. Retail partners agree but also think that there is room for sales growth and report that saturation of first-time buyers is only 20% of the market with 80% of the households in their retail areas not yet adopting CFLs. They also report that second-time buyers need an incentive to continue to buy CFLs. They note that the vast majority of sockets are still filled with incandescent bulbs and note the availability of specialty CFL bulbs that can capture a larger share of the market. Retailers note that they continue to sell far more standard bulbs than CFLs.

Program managers note that the approach using GE bulbs works well because GE has their own fulfillment house that pays the stores the Duke Energy incentive and then bills Duke Energy for those coupon sales, greatly simplifying the operations of the program thereby increasing program cost effectiveness. It also allows the GE fulfillment house to maintain accurate records on program sales that are then made available to Duke Energy as a program tracking metric. In this way Duke Energy can avoid much of the management and administration costs of the coupon payments and focus on tracking customers, market share progress and energy savings from those who used the coupons.

Challenges

The redemption rate of discount coupons distributed is dropping and may indicate a beginning of a reduction in need for additional CFLs for the targeted group of coupon users. While customers who use their coupons may not be sent follow-up offers if they have already obtained their maximum number of CFLs, managers note that some customers just don't use coupons. Managers note that they need to find a cost effective way to motivate the non-coupon user to buy CFLs now rather than waiting until they have no choice.

The mailing of coupons is targeted by zip code and calibrated to the need for savings and the budget for the program. Partners are informed of the mailing, and store managers report that it can be a challenge to anticipate the high traffic. Some store managers report an increase in CFL sales volumes of 500%. As an example, Sylvania (before the switch to GE) gave Duke Energy four weeks of data on sales before a coupon mailing. After the mailing the volume jumped to 10 times the weekly average for several weeks.

As a result, store managers report needing as much lead time as possible to plan for the increased traffic. They report that because they order their bulbs months in advance, they need longer notification lead times. However, when asked what changes are needed to the program, retail managers only identified the need for longer lead times between notification of the mailings and the actual mailing to allow them to prepare for the sales surge and the need to extend the coupon expiration date to allow for a longer sales period.

Response to Possible Slowing of Redemption Rates

Duke Energy managers noted that should they see a reduction in redemption rates for the discounted CFLs, they are considering ways to increase penetration. Duke Energy is exploring the opportunities for partnering with property managers and apartment owners to help promote CFL use by their tenants. Each of these approaches represents an added market niche for pushing CFL adoption and use to save energy. In view that the costs for CFLs are low, and savings are comparatively high for such a low cost item, it make sense for Duke Energy to move as many of the CFLs into the market as possible in ways that acquire net savings that are below program costs. In view that there is a need to acquire net savings to meet Duke Energy's savings goals, all cost effective routes for moving CFLs into the market should be explored until such time that new federal appliance standards make CFLs mandatory. Exploring and using all cost effective routes into the market, until such time as the market is effectively transformed, as documented by a market conditions in which most sockets are filled with efficient lighting products, can also serve as market channels for more efficient LED bulbs or other similar products as they become cost effective to deliver via these same routes. At this time the CFL market does not appear to be transformed and should not be considered transformed until the vast majority of bulbs sold are at least as efficient as CFLs. Retail managers report that the vast majority of the bulbs they sell remain incandescent bulbs. This period of time, in which the market still buys incandescence bulbs as the lighting technology of choice represents an opportunity period in which new net savings can be acquired via approaches that increase the sales and use of CFLs. This market opportunity may not last but a few more years as Duke Energy and other market interventions transform the market to the point where CFLs represent the majority of sales and net new savings become difficult to acquire.

CFL Coupon Redeemers

This survey focused on customers who, according to program tracking records, redeemed their CFL coupons. A total of 1,000 mail surveys were sent out to CFL redeemers (NC 747, SC 253). A total of 218 surveys were returned for a response rate of 21 percent.. Of these, 167 surveys were returned in North Carolina and 51 were returned in South Carolina with usable responses.

Participation in the Program

As seen in Table 4 nearly all of the redeemers responding to the survey (95.8% in North Carolina and 98.0% in South Carolina) recall using the coupons provided by Duke Energy themselves, while some (7.8% in both North and South Carolina) recall giving at least one of their coupons away to another user.

Table 3. Participation in the Program

	Used Coupon themselves		Gave coupons to someone else	
	Yes	No	Yes	No
NC (n=130)	95.8%	4.2%	7.8%	92.2%
SC (n=51)	98.0%	2.0%	7.8%	92.2%
Weighted average	**96.3%**	**3.7%**	**7.8%**	**92.2%**

Redeemers were asked to rate the influence several categories on their decision to purchase CFLs These categories included:

- The Duke Energy CFL coupon
- In-store advertising
- Advertising that was not in-store, such as tv, radio and newspaper ads
- Other advertising
- CFL brand
- Sales associates
- Friends and family

Possible responses for each category were Very Influential, Somewhat Influential, and Not Influential at All.

One-hundred thirty-one (82.9%) redeemers in North Carolina and thirty-six (76.6%) in South Carolina found the coupon from Duke Energy to be “very influential” in their decision to purchase CFLs, indicating that the coupon was a key purchase driver. Although previous Duke Energy CFL studies have found the CFL coupon from Duke Energy to be even more influential, the coupon still seems to be the main driver in redeemers' decisions to purchase CFLs.[5] In-store CFL

[5] “An Evaluation of Energy Star Products: Results of a Process and Impact Evaluation of Duke Energy’s CFL Promotion and Lighting Logger Programs” prepared for Duke Energy by TecMarket Works and Building Metrics, September 24, 2008, page 38. This study will be referenced as the “2008 study” through this report.

displays and signs were found to be somewhat influential, and other forms of advertising were found to be not at all influential by most redeemers. Redeemers did not find CFL branding or friends and family recommendations to be influential in their decision to purchase CFLs. As indicated in Table 5 and Figures 1 and 2, the Duke Energy coupon was the primary driver leading to the purchase of the program-induced CFL by a significant margin, however, the decision was also influenced, to a limited degree, by other events.

Table 4. Factors influencing CFL buying decision

	NC				SC		
	Very influential	Somewhat influential	Not at all		Very influential	Somewhat influential	Not at all
The coupon from Duke Energy	131	23	4		36	10	0
	82.9%	**14.6%**	**2.5%**		**78.3%**	**21.7%**	**0.0%**
CFL Brand	35	39	33		12	11	11
	32.7%	**36.4%**	**30.8%**		**35.3%**	**32.4%**	**32.4%**
Non in-store advertising (TV, radio, newspaper, etc.)	16	53	35		9	11	12
	15.4%	**51.0%**	**33.7%**		**28.1%**	**34.4%**	**37.5%**
In-store CFL displays and signs	25	51	32		7	19	12
	23.1%	**47.2%**	**29.6%**		**18.4%**	**50.0%**	**31.6%**
Friends or family	24	32	41		9	10	12
	24.7%	**33.0%**	**42.3%**		**29.0%**	**32.3%**	**38.7%**
Other advertising	10	25	42		3	11	12
	13.0%	**32.5%**	**54.5%**		**11.5%**	**42.3%**	**46.2%**
Sales associates at the store	35	39	33		5	7	17
	15.6%	**17.8%**	**66.7%**		**17.2%**	**24.1%**	**58.6%**
Online coupon from Duke-energy.com	13	5	10		1	3	3
	46.4%	**17.9%**	**35.7%**		**14.3%**	**42.9%**	**42.9%**

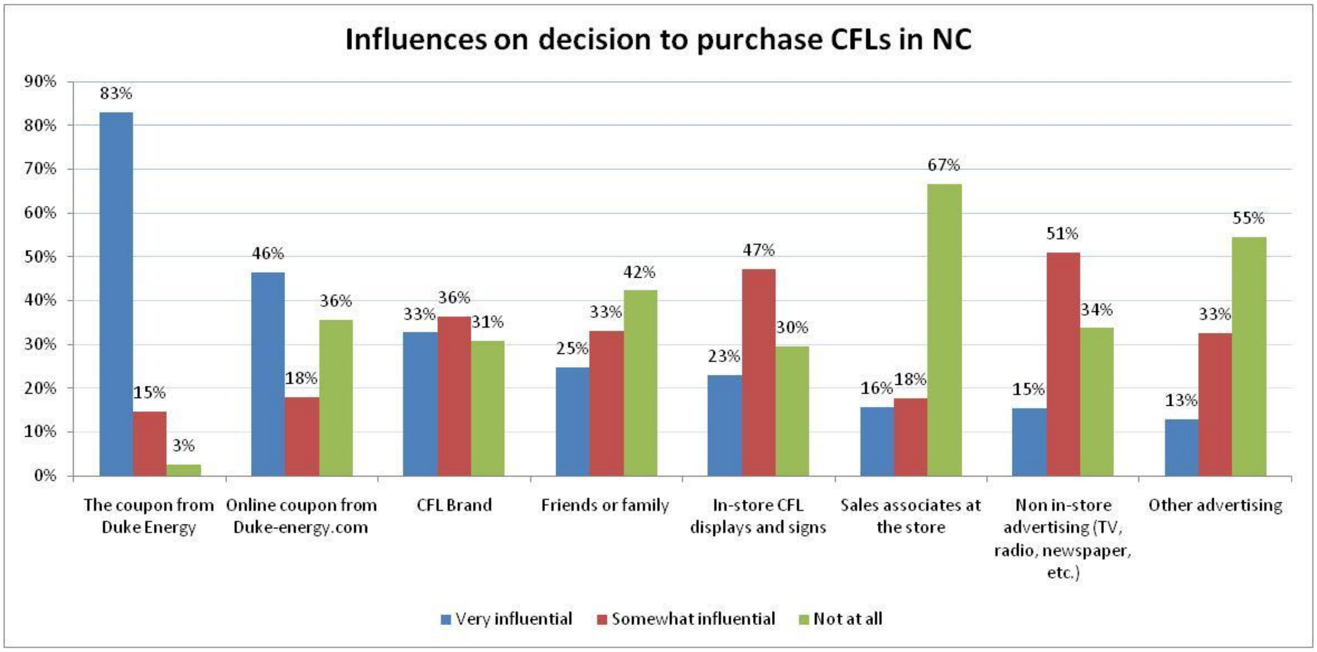


Figure 1. Influences on Decision to Purchase CFLs in North Carolina

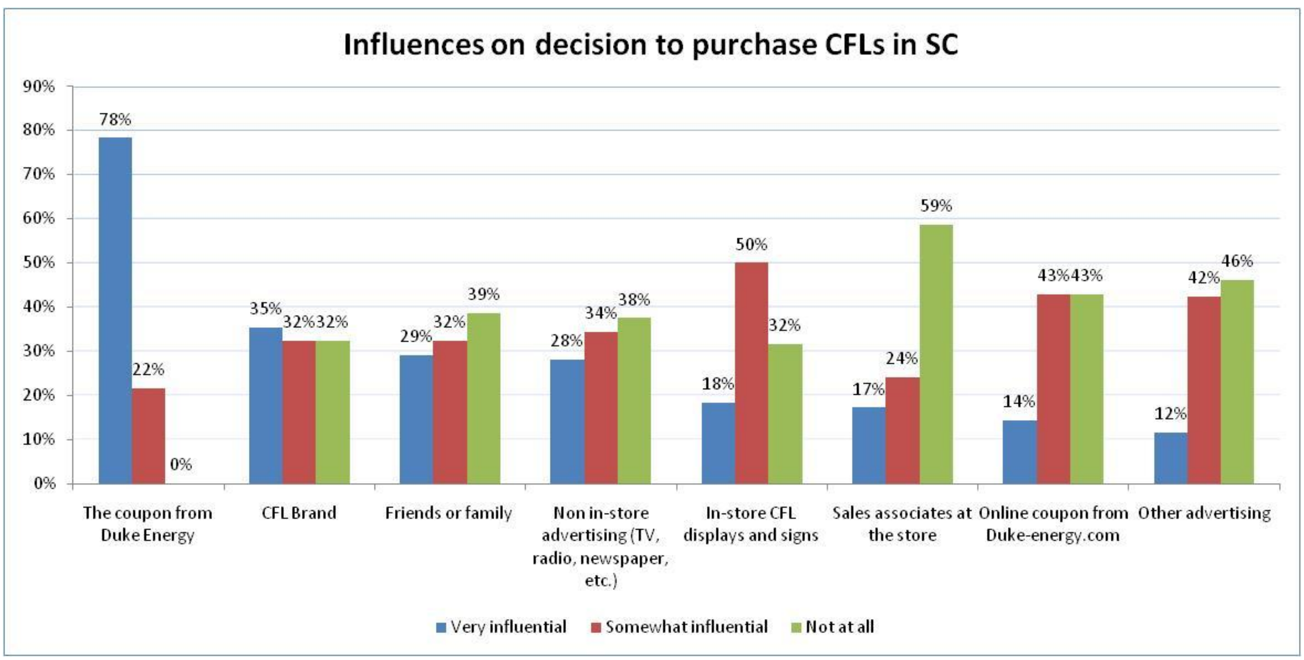


Figure 2. Influences on Decision to Purchase CFLs in South Carolina

As shown in the table below, the majority of redeemers in North Carolina (63.5%) and South Carolina (52.9%) recalled purchasing their CFLs at Wal-Mart using the CFL coupons. In addition, redeemers also mentioned other stores where they recalled purchasing CFL bulbs using the manufacturer's coupons.

Table 5. Location of CFL coupons redeemed

Store	NC		SC	
	N	%	N	%
Wal-Mart	106	**63.5%**	27	**52.9%**
Not specified	45	**26.9%**	21	**41.2%**
Home Depot	2	**1.8%**	1	**2%**
Lowe's	8	**4.8%**	1	**2%**
Target	3	**1.8%**	0	**0%**
Walgreens	1	**0.6%**	0	**0%**
Dollar General	2	**1.2%**	0	**0%**
Publix	0	**0%**	1	**2%**

Redeemers were asked if they purchased any of the following additional items when they purchased their CFLs: wall/ceiling insulation, faucet aerators, showerheads, weather stripping, caulking, outlet gaskets, or programmable thermostats. Most redeemers did not purchase additional items when purchasing their CFLs (88.3% in North Carolina and 90.2% in South Carolina). In North Carolina those redeemers who did purchase additional items purchased weather stripping, caulking, outlet gaskets, wall or ceiling insulation, or a programmable thermostat. In South Carolina redeemers who purchased additional items purchased weather stripping or caulking. These numbers reflect that when program participation influences additional purchases, those typically focus on lower cost items.

Table 6. Additional measures purchased when redeeming Duke Energy's CFL coupon

Measure	NC		SC	
	N	%	N	%
None	150	**88.3%**	46	**90.2%**
Caulking	7	**4.1%**	2	**3.9%**
Weather stripping	6	**4.6%**	3	**5.9%**
Low flow showerhead	2	**1.2.%**	0	**0%**
Faucet aerators	0	**0.0%**	0	**0.0%**
Electric wall outlet gaskets	1	**0.6%**	0	**0%**
Wall or ceiling insulation	3	**1.8%**	0	**0%**
Programmable thermostat	3	**1.8%**	0	**0%**

Use of CFL Coupons

Redeemers could have purchased between four and sixteen bulbs using the Duke Energy coupons. The majority of redeemers stated they purchased four or more CFLs, with over half of redeemers (64.5% in North Carolina and 47.4% in South Carolina) indicating they purchased six or more CFLs. This data indicates that not only was the Duke Energy coupon the key driver for the purchase decision, but that purchase decisions typically involved four or more bulbs. A small number of redeemers stated that they purchased 1 or 2 CFLs. Since the CFLs eligible for the coupons were packages of 2 or 6 bulbs, these redeemers may have been describing the number of packages of CFLs they purchased, or they did not recall the number of bulbs purchased and were providing their best guess. The results are shown in Table 8.

Table 7. Number CFLs purchased, installed and stored for later use as a percentage of redeemers.

			0	1	2	3	4	5	6	7-11	12+
CFLs purchased with coupon	NC	N	5	3	7	10	23	3	53	30	10
		%	3.5%	2.1%	4.9%	6.9%	16.0%	2.1%	36.8%	20.8%	6.9%
	SC	N	2	1	4	4	8	1	17	8	3
		%	4.2%	2.1%	8.3%	8.3%	16.7%	2.1%	35.4%	16.7%	6.3%
CFLS installed	NC	N	6	8	10	15	25	4	49	24	8
		%	4.0%	5.4%	6.7%	10.1%	16.8%	2.7%	32.9%	16.1%	5.4%
	SC	N	3	1	6	9	7	1	13	5	1
		%	6.5%	2.2%	13.0%	19.6%	15.2%	2.2%	28.3%	10.9%	2.2%
CFLs stored for later use	NC	N	103	9	12	7	7	0	7	3	0
		%	69.6%	6.1%	8.1%	4.7%	4.7%	0.0%	4.7%	2.0%	0.0%
	SC	N	35	2	3	3	1	0	3	1	1
		%	71.4%	4.1%	6.1%	6.1%	2.0%	0.0%	6.1%	2.0%	2.0%

CFL Installation Rates

In North Carolina redeemers indicated that they had purchased 903 CFLs with coupons and of those 827 (91.6%) were installed. Two-hundred eighty-three (283) CFLs were purchased with coupons and 218 (77.1%) were installed in South Carolina. To obtain these numbers the 7-11 choice category was averaged to 9 bulbs and the specific numbers given by redeemers who had more than 12 CFLs were used. Along with the high installation rates Figure 8 illustrates that a high percentage of program CFLs are being put installed in sockets.

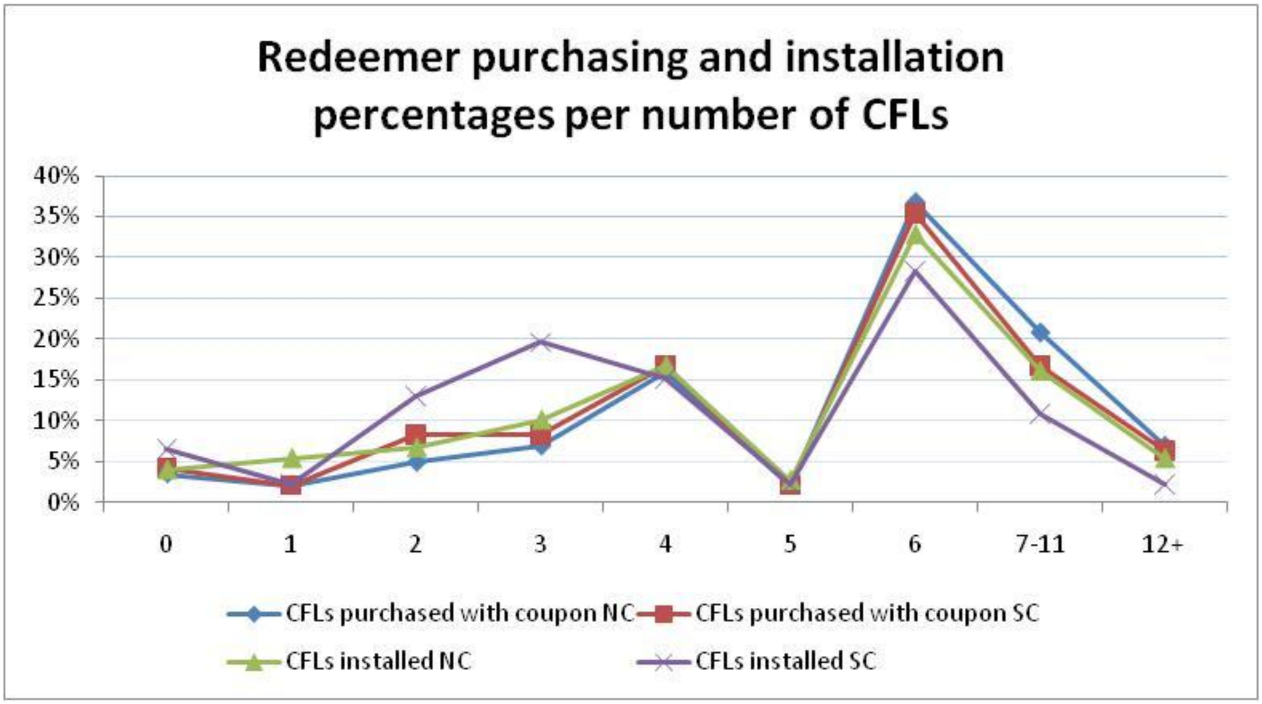


Figure 3. Number of CFLs purchased, installed and stored as a percentage of respondents

CFL Coupon Estimated Negative Influence

Redeemers were asked if they would have purchased any CFLs if the Duke Energy Smart $aver® coupon had not been available, and, if so, how many.

As shown in Table 8, more than 40% (43% in North Carolina and 48.6% in South Carolina) of redeemers stated that they would not have bought any CFLs if the coupon had not been available, and an even larger number of redeemers (51.8% in North Carolina and 55.6% in South Carolina) stated that they have not purchased any additional CFLs since using the coupon. These two statements corroborate the previous statement made by redeemers that receiving the coupon in the mail was most influential in a participant's decision to purchase CFLs.

Table 8. Estimated Influence of No Coupon, Additional Purchases and CFLs given away

			None	1	2	3	4	5	6	7-11	12+
Estimated CFLS bought if coupon had not been available	NC	N	69	5	14	10	19	1	16	9	4
		%	**46.9%**	**3.4%**	**9.5%**	**6.8%**	**12.9%**	**0.7%**	**10.9%**	**6.1%**	**2.7%**
	SC	N	23	1	9	1	3	0	6	4	2
		%	**46.9%**	**2.0%**	**18.4%**	**2.0%**	**6.1%**	**0.0%**	**12.2%**	**8.2%**	**4.1%**
CFLs purchased since participating	NC	N	93	3	9	3	14	2	10	12	2
		%	**62.4%**	**2.0%**	**6.0%**	**2.0%**	**9.4%**	**1.3%**	**6.7%**	**8.1%**	**2.0%**
	SC	N	25	1	2	2	7	2	7	2	2

		%	**50.0%**	**2.0%**	**4.0%**	**4.0%**	**14.0%**	**4.0%**	**14.0%**	**4.0%**	**4.0%**
CFLs given away	**NC**	N	138	2	1	3	0	0	2	0	0
		%	94.5%	1.4%	0.7%	2.1%	0.0%	0.0%	1.4%	0.0%	0.0%
	SC	N	41	1	1	1	1	1	1	0	1
		%	85.4%	2.1%	2.1%	2.1%	2.1%	2.1%	2.1%	0.0%	2.1%

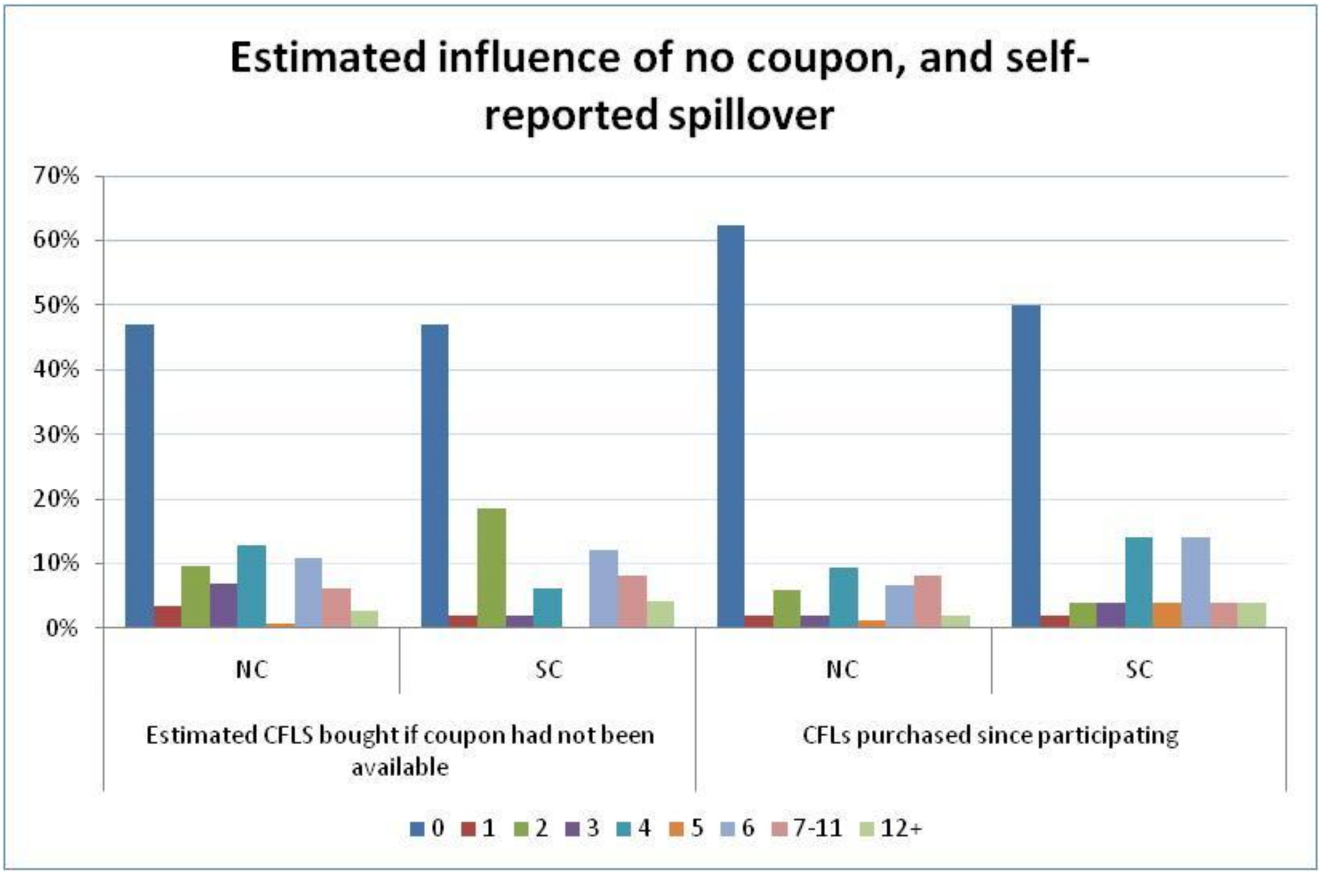


Figure 4. Estimated amount of bulbs bought if no coupon had been available, and additional purchases of CFLs in NC and SC

CFL Usage and Satisfaction

Redeemers were asked if their lighting hours of use had changed at all after installing CFLs. Most redeemers have not altered their behavior after installing their CFLs; that is, 84.3% of redeemers in North Carolina and 82.2% of redeemers in South Carolina reported that they have not changed the hours of use of light fixtures. Of those redeemers who did change their usage in North Carolina, 11.1% reported increasing hours and 4.6% reported decreasing their hours of use. In South Carolina 13.3% of redeemers reported decreasing their hours of use while 4.5% said that their hours of use had increased. This data suggests that snap-back is not associated with the Duke Energy CFL purchases – that is, customers are not using their fixtures more now that they are saving money on the use of those fixtures.

Eighty-nine percent (89%) of redeemers in North Carolina and 88% of redeemers in South Carolina reported that they have not removed any of the CFLs they installed. Of those redeemers who did remove a CFL they had installed, two-thirds (66.7%) in North Carolina and 46.7% in South Carolina did so because the bulb burned out.

Table 9. Lighting hours of use changes in NC and SC

	NC			SC		
	Increased	Decreased	No change	Increased	Decreased	No change
Fixture hours of use	17	7	129	2	6	37
	11.1%	**4.6%**	**84.3%**	**4.5%**	**13.3%**	**82.2%**

Table 10. CFLs bought with coupon and subsequently removed

Number of bulbs		0	1	2	3	4	5
NC	N	97	9	14	7	2	2
	%	**74.0%**	**6.9%**	**10.7%**	**5.3%**	**1.5%**	**1.5%**
SC	N	31	5	2	1	1	0
	%	**77.5%**	**12.5%**	**5.0%**	**2.5%**	**2.5%**	**0%**

Table 11. Reasons for removing coupon CFLs

Reasons for removal→		**Burned out**	**Not bright enough**	**Too slow to start**	**Did not like the light**	**Other**
NC	N	24	5	5	1	2
	% of all bulbs removed	**66.7%**	**13.9%**	**13.9%**	**2.8%**	**5.6%**
SC	N	6	4	2	0	2

	% of all bulbs removed	**46.7%**	**26.7%**	**13.3%**	**0%**	**13.3%**

Survey respondents in both North Carolina and South Carolina who chose "other" for their reason of removal declined to give specific reasons.

Previously installed CFLs

44.1% of redeemers in NC and 66.7% in SC stated they already had at least one CFL installed in their house before purchasing bulbs with Duke Energy coupons, and just over half of redeemers stated they had not already had CFLs installed. Of those redeemers who indicated that they had already installed a CFL, 52.1% in North Carolina and 58.9% in South Carolina had already installed 2, 3, or 4 bulbs. That is while they were already users, the level of use was small, representing only a few sockets per home. That is, these customers had not been previously transformed by other market pressures to be dedicated CFL users

32% of redeemers in North Carolina and 29.5% in South Carolina with previously installed CFLs had 6 or more bulbs installed. This translates to 16.9% of all redeemers surveyed in North Carolina, and 19.5% in South Carolina. CFLs continue to penetrate the market with new adopters moving to CFLs and significantly more new adaptors moving to CFLs via Duke Energy programs. Duke Energy is moving the market forward with respects to CFL first us adopters and increased adoption from previous adopters.

Table 12. Pre-installed CFLs

	NC		**SC**	
	Yes	No	Yes	No
CFLs pre-installed?	75	95	34	17
	44.1%	**55.9%**	**66.7%**	**33.3%**

Table 13. Numbers and percentages of pre-installed CFLs

Number of bulbs pre-installed →		**1**	**2**	**3**	**4**	**5**	**6**	**7-11**	**12+**
NC	N	8	13	11	15	2	4	5	13
	% of respondents with pre-installed CFLs (n=75)	10.7%	17.3%	14.7%	20%	2.7%	5.3%	6.7%	17.3%
	% of all surveyed (n=170)	**6.2%**	**10%**	**8.5%**	**11.5%**	**1.5%**	**3.1%**	**3.8%**	**10%**
SC	N	4	4	5	11	0	4	4	2
	% of respondents with pre-installed CFLs (n=33)	11.8%	11.8%	14.7%	32.4%	0.0%	11.8%	11.8%	5.9%
	% of all surveyed (n=51)	**7.8%**	**7.8%**	**9.8%**	**21.6%**	**0.0%**	**7.8%**	**7.8%**	**3.9%**

Table 14. Addition CFL purchases in NC and SC

	Number of respondents who purchased additional CFLs	Percentage of all respondents	Number of CFLs purchased	CFLs purchased divided by all survey respondents
NC	58	34.7%	322	1.93
SC	24	47.0%	139	2.72

In addition to the number of pre-installed CFLs, redeemers were asked how long they had been using CFLs before using the Duke Energy coupon. Responses included:

- Never purchased until now
- 1 year or less
- 1-2 years
- 2-3 year
- 3-4 years
- 4 or more years

As seen in Table 15 below, 17.9% of redeemers in NC and 34.7% of redeemers in SC indicate that they have been using CFLs for more than two years and 33.3% of redeemers in North Carolina and 26.5% of redeemers in SC indicate that this is their first time using a CFL. This data suggests that CFL saturation is still low within the coupon redeeming population prior to the use of the Duke Energy coupon.

Table 15. Time since first purchase of CFLs in NC and SC

	Never purchased until now	1 year or less	1-2 Years	2-3 Years	3-4 Years	4 or more years
NC	52	29	47	18	3	7
	33.3%	**18.6%**	**30.1%**	**11.5%**	**1.9%**	**4.5%**
SC	13	9	10	11	2	4
	26.5%	**18.4%**	**20.4%**	**22.4%**	**4.1%**	**8.2%**

Redeemers were asked to rate their satisfaction with the CFLs redeemed with their Duke Energy coupon. Ninety-eight percent (97.9%) of redeemers in North Carolina and 93.6% or redeemers in South Carolina are at least somewhat satisfied and 79.9% of redeemers in North Carolina and 74.5% of redeemers in South Carolina of were very satisfied with their CFLs.

Table 16. CFL satisfaction in NC and SC

	Very	Somewhat satisfied	Not at all satisfied

		Satisfied		
NC	N	115	26	3
	%	**79.9%**	**18.1%**	**2.1%**
SC	N	35	9	3
	%	**74.5%**	**19.1%**	**6.4%**

When CFL satisfaction was tallied for only those redeemers who removed the CFLs purchased with the Duke Energy coupon, 83% (5 of 6) of redeemers in South Carolina and 65% (11of 17) of redeemers in North Carolina indicated they were very satisfied with their Duke Energy CFLs. In North Carolina 35% (6 of 17) of redeemers who removed a CFL indicated that they were somewhat satisfied with the CFLs. This is twice the percentage of "somewhat satisfied" responses in the overall survey population and nearly a third of all the "somewhat satisfied" responses in North Carolina, indicating that bulb removal, as would be expected, has a negative correlation with CFL satisfaction. Time since first installation of CFLs had no impact on satisfaction levels suggesting that long-time users are not more or less satisfied with their CFLs than are new users.

Effects of Price on Future CFL Purchases

Redeemers were asked to consider their future CFL purchases and identify how many CFLs they would expect to purchase in the next year if CFLs were offered at a certain price compared to a standard (incandescent) bulb. The prices offered were:

- The same price as a standard bulb
- $1 more than a standard bulb
- $2 more than a standard bulb
- $3 more than a standard bulb

Redeemers were also asked how many CFLs they would purchase if they were free, but required a mail-in rebate form.

Results are shown for North Carolina in Table 17 and for South Carolina in Table 18 below and illustrated in Figure 5 through Figure 7. With CFLs being offered at the same prices as a standard bulb, 91.3% of redeemers in North Carolina and 83.7% of redeemers in South Carolina will purchase at least one CFL, and 72.4% of redeemers in North Carolina and 74.4% of redeemers in South Carolina indicated they would purchase four or more. More than 71% of redeemers in North Carolina and 68% of redeemers in South Carolina indicated they would purchase at least one CFL bulb if the price per bulb was $1 more than standard incandescent bulbs. When the price reaches $2 more 54.7% of redeemers in North Carolina and 46.5% of redeemers in South Carolina indicate they would not purchase CFL bulbs. This indicates that customers are expecting CFL prices that are comparable to incandescent lighting.

If the CFL bulbs are free with a rebate form, 80.3% of redeemers in North Carolina and 81.0% of redeemers in South Carolina said that they would purchase at least one CFL. Since these percentages are lower than the percentages for CFLs at the same price as incandescent bulbs in both states, this suggests that 10% to 15% of redeemers may be experiencing a barrier other than price when deciding to purchase CFLs.

For example, some customers may not be at all interested in purchasing CFLs due to size, slow illumination, aesthetics or the quality of light and would not purchase CFLs regardless of price or price difference. In addition, for some of these redeemers the hassle of the rebate process may outweigh other advantages of purchasing CFLs; for example, 17 (9.9%) redeemers in North Carolina and 3 (7.4%) redeemers in South Carolina stated they would purchase CFLs at a price equal to standard bulbs would not obtain them if they were free through the use of a rebate.

Table 17. Hypothetical CFL buying habits in North Carolina under 4 different pricing scenarios

		0	1-2	3	4	5	6	7-11	12+
If CFLs were the same price as a standard bulb	N	13	17	7	12	5	28	19	33
	%	**9.7%**	**12.7%**	**5.2%**	**9.0%**	**3.7%**	**20.9%**	**14.2%**	**24.6%**
If CFLs were $1.00 more than standard bulbs	N	33	19	9	15	6	17	5	11
	%	**28.7%**	**16.5%**	**7.8%**	**13.0%**	**5.2%**	**14.8%**	**4.3%**	**9.6%**
If CFLs were $2.00 more than standard bulbs	N	58	18	7	11	6	2	0	4
	%	**54.7%**	**17.0%**	**6.6%**	**10.4%**	**5.7%**	**1.9%**	**0.0%**	**3.8%**
If CFLs were $3.00 more than standard bulbs	N	75	14	5	7	1	4	0	2
	%	**69.4%**	**13.0%**	**4.6%**	**6.5%**	**0.9%**	**3.7%**	**0.0%**	**1.9%**
If CFLs were free but required a mail-in rebate form	N	24	9	6	11	2	21	15	34
	%	**19.7%**	**7.4%**	**4.9%**	**9.0%**	**1.6%**	**17.2%**	**12.3%**	**27.9%**

Table 18. Hypothetical CFL buying habits in South Carolina under 4 different buying scenarios

		0	1-2	3	4	5	6	7-11	12+
If CFLs were the same price as a standard bulb	N	7	4	0	5	2	13	4	8
	%	**16.3%**	**9.3%**	**0.0%**	**11.6%**	**4.7%**	**30.2%**	**9.3%**	**18.6%**
If CFLs were $1.00 more than standard bulbs	N	13	5	2	4	4	9	0	4
	%	**31.7%**	**12.2%**	**4.9%**	**9.8%**	**9.8%**	**22.0%**	**0.0%**	**9.8%**

If CFLs were $2.00 more than standard bulbs	N	20	9	5	1	1	4	2	1
	%	46.5%	20.9%	11.6%	2.3%	2.3%	9.3%	4.7%	2.3%
If CFLs were $3.00 more than standard bulbs	N	32	1	3	2	0	2	0	1
	%	78.0%	2.4%	7.3%	4.9%	0.0%	4.9%	0.0%	2.4%
If CFLs were free but required a mail-in rebate form	N	8	5	0	4	3	13	3	6
	%	19.0%	11.9%	0.0%	9.5%	7.1%	31.0%	7.1%	14.3%

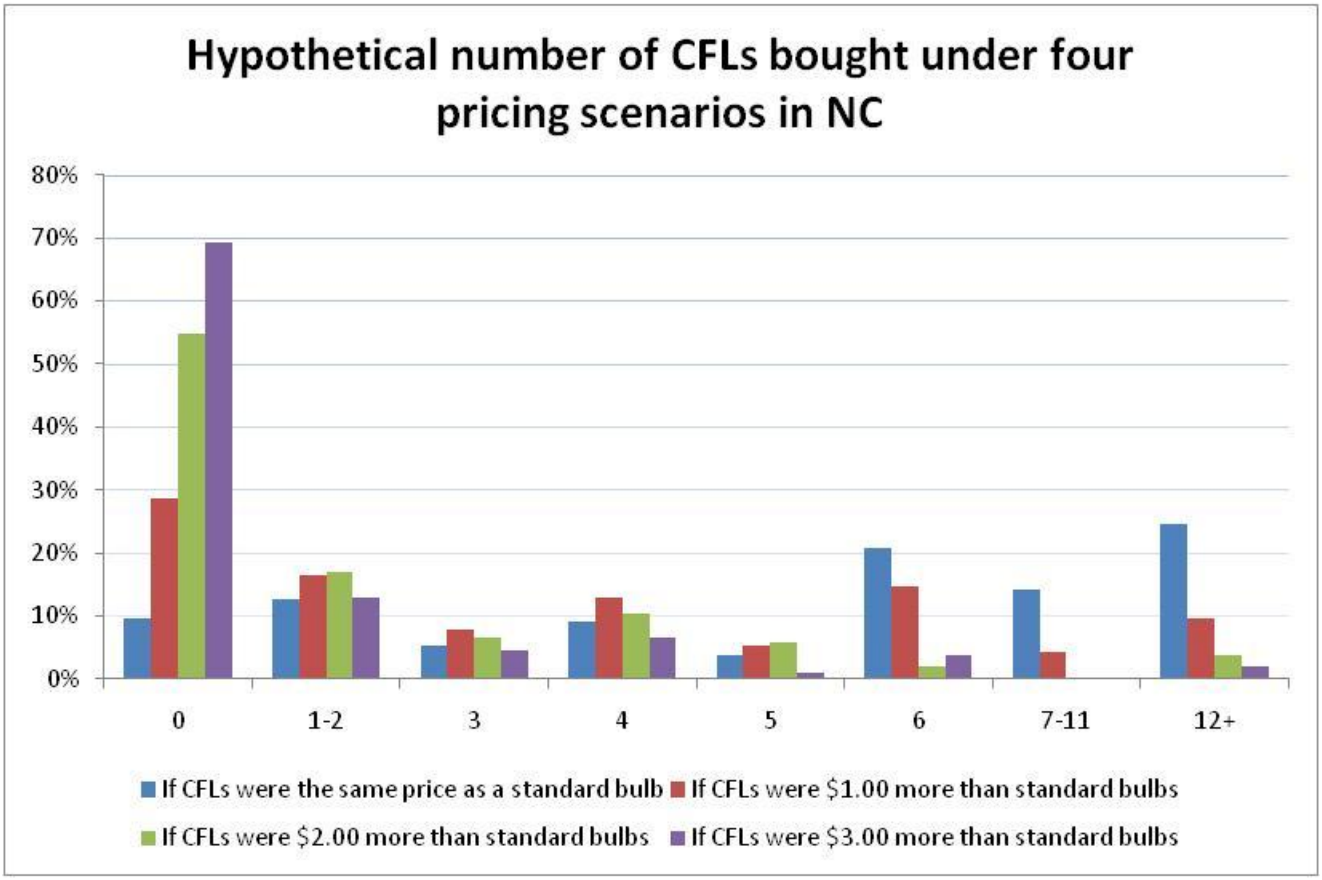


Figure 5. Hypothetical CFL pricing scenarios in North Carolina

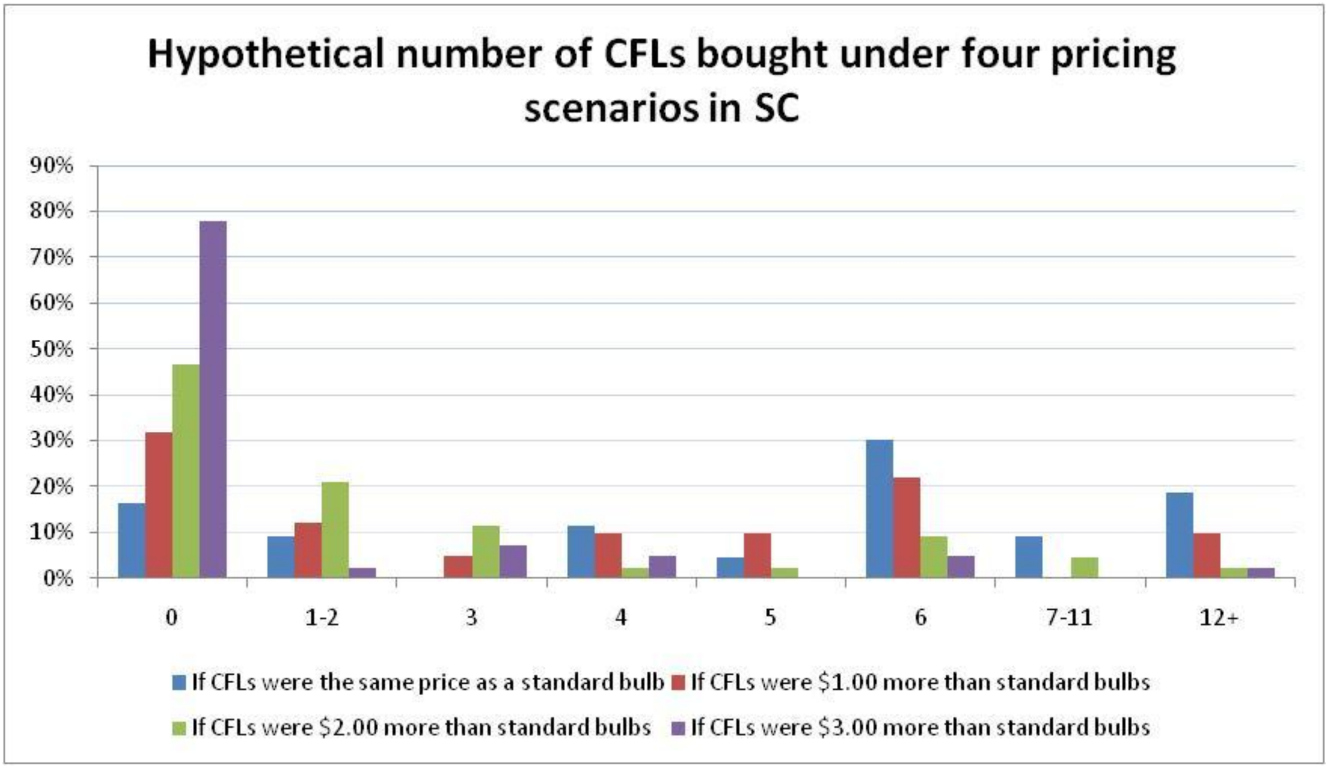


Figure 6. Hypothetical pricing scenarios in South Carolina

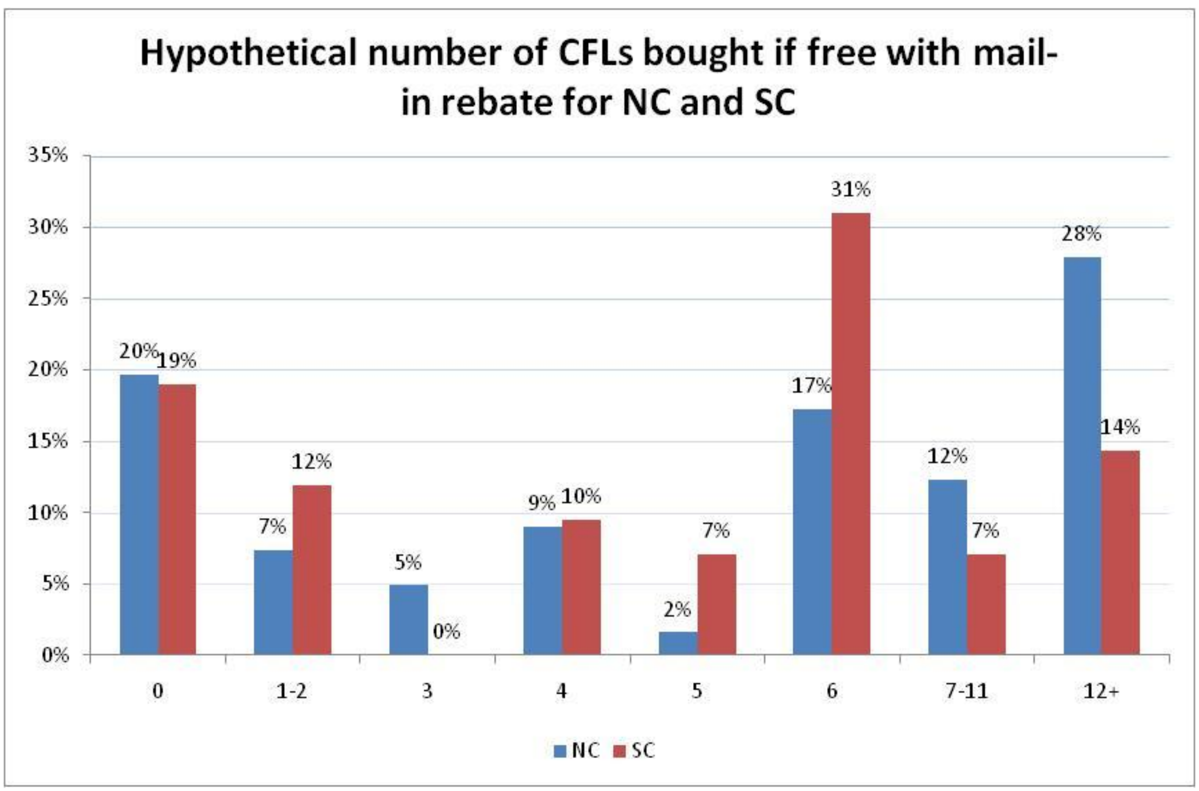


Figure 7. Hypothetical CFLs bought with free mail-in rebate in NC and SC

Influence of program CFLs on redeemer confidence and future use of CFLs

Redeemers were asked a series of five questions to determine the influence of program CFLs on their confidence in CFLs and their likelihood of buying CFLs in the future.

The specific categories to rate were:

- Confidence to use CFLs in the future
- Coupon’s influence to in choosing CFLs in the future
- Confidence in performance of CFLs bought with the coupon to meet expectations
- Likelihood of buying CFLs in the future
- Likelihood to use a CFL if you had to change a light bulb

Each category had five ratings for redeemers to choose from:

- Much more likely/confident/better
- More likely/confident/better
- About the same
- Less likely/confident or worse
- Much less likely confident or worse

Results are compared between new and previous adopters and summarized in Figure 8 and Figure 9 below. NC and SC results were combined to provide a more reliable sample size for both adopter categories.

Overall, new adopters rated their confidence in CFLs, influence of the program, and performance of CFLs higher than redeemers who had used CFLs previously. However, when combining the ratings of “about the same” or higher, new adopters and previous adopters had very similar total percentages in all categories. This suggests that the program has a positive influence on the confidence level of new adopters of CFLs and does not negatively affect the opinions of previous adopters.

Figure 9 shows that new adopters and previous adopters are equally as likely to purchase and install CFLs in the future. This suggests that in North and South Carolina, new adopters who participate in the Duke Energy Smart $aver® CFL program are likely to deliver savings via installation and continued use rates that are comparable to previous adopters of CFLs.

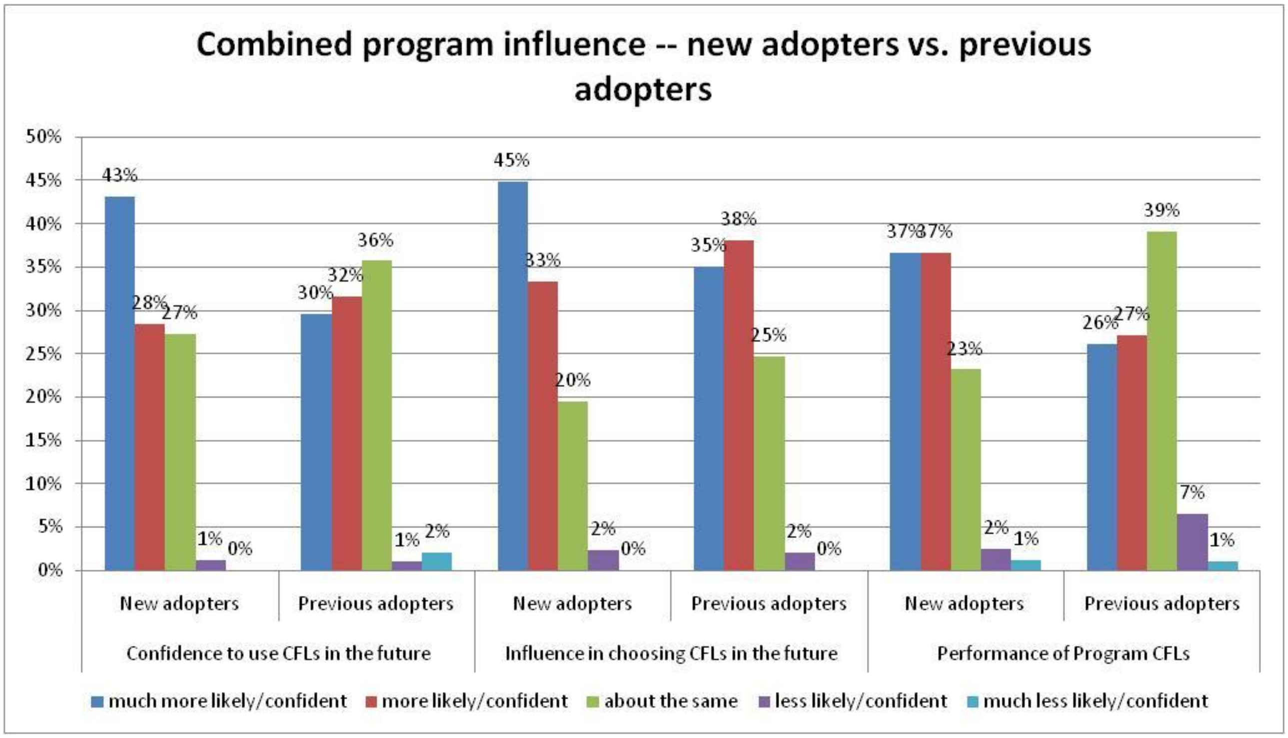


Figure 8. Forward looking influence of program in NC and SC combined. N=97 for previous adopters. N=87 for new adopters.

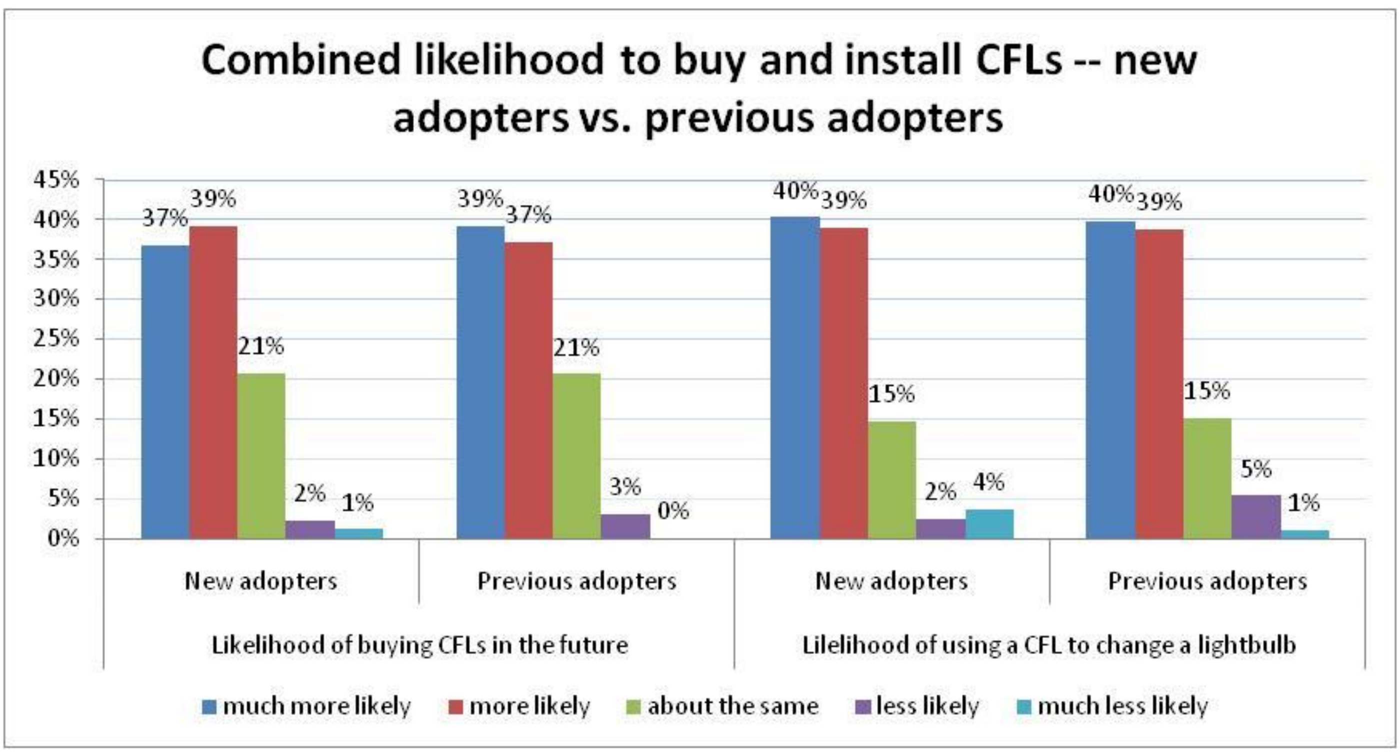


Figure 9. Forward-looking influence of program on buying and replacing habits in NC and SC combined. N=97 for previous adopters. N=87 for new adopters.

CFL Net to Gross Analysis

In order to assess the net impacts of the CFL coupon distribution effort we assessed the level of freeridership (those who would have taken the same action without the program) and the level of spillover (similar actions taken on their own after the program experience as a result of the program but without the Duke Energy coupon). Together the results of these two analyses are combined to estimate the total short-term net effects of the program and to calculate the net-to-gross ratio for the savings achieved as a result of the effort. These approaches and their results are presented below:

Freerider Analysis

The freerider analysis uses a typical self-reporting approach for estimating freeridership levels. This analysis compares what people actually purchased with what they said they would have purchased without the Duke Energy Coupon. The purchase records for each customer were taken from the Duke Energy coupon redemption database. This database tracks all coupons redeemed by the individual customer who received the coupon. Each coupon was bar-coded for the individual customer's address, allowing each customer's purchase behavior to be tracked, including the number of bulbs they purchased. The number of bulbs that these customers said that they would have purchased was taken directly from the coupon redeemer survey. To estimate the level of freeridership, only the surveys from customers who answered the question about their purchase behavior in the absence of the coupons were used. Likewise, only the number of bulbs actually purchased from these same customers was used in the freerider analysis. This approach, while reducing the population for the analysis, does allow the freeridership analysis to be conducted using a direct comparison of purchase behavior and stated purchase intent (without the program). All freeridership data from customers who could not answer the purchase behavior questions is not used in the analysis. In addition, the survey data was cleaned of illogical responses. That is, when the customer indicated that they would have bought more CFLs without the discounted price than they had purchased with the coupons, these survey responses, and the associated bulbs that they had purchased, were also excluded from the freeridership analysis. It does not make logical sense that participants would buy more CFLs at a higher price than they would have purchased as a reduced price.

A total of 1,000 mail surveys were sent out to CFL redeemers (NC 747, SC 253). A total of 218 surveys were returned for a response rate of 21 percent. Of the 218 surveys that were returned for analysis, 132 of the respondents were able to provide answers to the questions regarding how many bulbs they would have purchased without the Duke Energy coupon (61%) and also provided logical responses to these questions. In this data quality control step customers were allowed to indicate that they would have purchased up to the total amount of bulbs that were purchased with the Duke Energy coupons as the maximum level of bulbs that they would have purchased without the program. If the customer said that they would have purchased more bulbs than the maximum level without the discounted price (coupon value) without the program, his or her survey answers were excluded from the freeridership analysis for having invalid responses. The responses from this group of 132 respondents are used to calculate the freerider rate by comparing their self-reported estimate of the amount they would have purchased with the number of bulbs they actually purchased. This is called the self-report approach.

Self-report approaches typically provide conservatively biased results that act to increase the apparent freerider rate over the actual freerider rate. When self-report approaches are used, the resulting analyses should be considered conservatively biased, and represent the highest level of freeridership that would be typical for that population. There are three types of embedded biases which act to increase the apparent level of freeridership. These include:

1. **Self selection bias:** Customers who returned a CFL survey are a self-selected population. That is, they have elected to return the survey on their own, without prompting or incentives that act to increase response rates and potentially lowering the rate of bias. That is, customers who are most interested in CFLs and are more likely to use them on their own, and have a greater probability of returning the survey than people who do not.
2. **Socially accepted response bias:** People who respond to behavior-related surveys in which they are asked to report if they have taken an action associated with a social expectation are more likely to provide the more socially acceptable response. Because of the amount of social pressures to lower energy use and lower carbon footprint, survey respondents are more likely to indicate that they would have taken the socially accepted action without being pushed to take that action via a market push effort.
3. **Positive outcome bias:** The social science literature also indicates that causal attribution responses are influence by the outcome of the results of the behavior taken. If a respondent likes the results (saved energy / lowered utility bill) they are more likely to take credit for that behavior, and indicate that they would have taken the action on their own. If they do not like the results of the behavior taken, then they are more likely to credit that behavior to someone or something other than themselves.

This analysis assigned zero effects to these biases. That is, the results of the freerider analysis are not adjusted to account for these biases that tend to increase apparent freerider rates and lower apparent net savings. As a result, the levels of freeridership and the resulting net benefits should be considered conservative. It is likely the net energy savings estimated as a result of this analysis are greater than that indicated below.

There were a total of 908 bulbs purchased by the participants who were able to provide responses the survey questions on how many bulbs they would have purchased without the program's coupons. The total number of bulbs that these customers said that they would have purchased without the Duke Energy coupons is 172 bulbs.

Table 19. CFL freeridership estimate

	Number of bulbs purchased by the 278 respondents	Number of bulbs they said that they would have bought at the same time without the coupon	Freerider estimate
Summary analysis	908	172	18.9%

This means that according to the customer's responses pertaining to what they would have purchased if the program had not been in effect, 81.1% of all bulbs acquired would not have been acquired without the Duke Energy coupons. By distributing discount coupons to Duke

Energy's customers, approximately 18.9% of those bulbs would have been purchased without the program. This level of freeridership is also consistent with previous evaluations that indicate that freeridership for CFLs typically falls in the 20 to 40% range, but also indicate that when mass mailed coupons are used, the freeridership rate may be less than the score for programs in which participants must first enroll in a program to receive their bulbs. That is, the Duke Energy coupon program may put more CFLs in homes of people who would not have acquired them on their own than programs that require the completion of a program application.

Spillover Analysis

Spillover is defined as additional savings that are caused by the program, but not associated with the actions (rebates or coupons) offered by a program. They are the actions that customers take because of the behavior changes caused directly or indirectly by participation in a program. There are two types of spillover (participant and non-participant), and within the two types of spillover there are two categories of spillover (short-term and long-term).

Table 20. CFL spillover matrix

	Short-Term Spillover	Long-term Spillover also called Market Effects
Participant	Actions taken by a participant above and beyond those provided by a program, but which were caused as a result of taking part in a program. (For example: When a participant replicates a program action outside of a program because of the influence of the program on their short-term purchase behavior.)	Savings achieved through a long-term change in the decision systems of a participant so that the energy efficient choice is replicated over a long term period; a more permanent behavior change. (For example: When a participant tries a technology via a program, likes it, and then decides to use only that technology whenever possible, over the longer term.)
Non-participant	Actions taken by a non-participant which were caused as a result of someone taking part in a program. (For example: when a participant tells a neighbor about what they did via the program, and the neighbor replicates that action taken by the participant, but does not take part in the program themselves.)	Actions taken that are the result of the effects of a program's impact on the ways a market operates. (For example: A program that changes the way technologies are ordered, stocked and sold in a market, when that change can be demonstrated as a result of the program's effects on that market.)

The spillover analyzed in this study examine only the short-term participant spillover.

In order to estimate the short-term spillover effects of the program we asked customers if they purchased additional CFLs that were influenced by their experience with the program's CFLs.

In conducting this analysis we applied cause-and-effect coefficients to estimate the percent of the additional bulbs purchased by participants that were caused or influenced by the program.

To conduct this analysis we asked participants how many additional bulbs they had purchased without the coupons following their purchase of the Duke Energy CFLs. Again, not all customers could provide answers to this question. Thus, this analysis only includes the responses from the customers that could answer the spillover questions. In addition, the answer to the questions that indicate spillover effects are not applied to the population and are only counted as spillover for the individual.

One-hundred forty-nine (149) of the surveyed respondents were able to provide answers for the spillover questions and also indicated that they had purchased additional CFLs. Of the 149 providing answers to the spillover questions, these customers self-reported that they had purchased an additional 307 bulbs following their participation in the program. This set 307 as the maximum number of bulbs that could potentially be counted as spillover impacts.

We then asked them questions pertaining to the influence of the Duke Energy coupons on their purchase decisions. Two different spillover influence factors were asked of this group; one focusing on the program impact in their confidence associated with using CFLs in the future, and the other focusing on confidence in purchasing CFLs in the future. This allowed the spillover analysis to be based on two different, but related, spillover calculation metrics (confidence in future purchases and confidence in future use). The spillover analysis was set to prohibit any double counting of savings from spillover (metric values greater than 1.0 when combined) but also to set the metrics at a conservative level to allow a bulb to be counted as spillover only when both the confidence in purchase question and the confidence in use question were scored at their maximum level of cause and effect.

To accomplish this we set the maximum value for each of these confidence factors at .5 and added their values to obtain a per customer spillover score. Credit for a spillover effect was only given if the respondent scored these factors as the program causing them to be “much more confident” (.5 score) or “more confident” (.25 score). That is, they had to provide a positive score across both these metrics in order to receive any credit as a spillover bulb. In addition, they had to provide the maximum response for both questions in order for a follow-up purchase to be considered a fully counted bulb. This approach provides a level of analytical assurance that spillover bulbs would not be over-counted, but left open the possibility that spillover bulbs could be undercounted. In conducting this analysis we only included bulbs that the participant reported that they had already purchased. While we asked if they are more likely to buy CFLs in the future because of their experience with the Duke Energy CFLs, this score was not used to project additional future sales, or provide a larger spillover credit for those projected sales. This approach allows the spillover analysis to be conservative in the estimated impacts. As a result of this approach, it is likely that spillover impacts are considerably higher than what is reflected in this analysis, especially if longer-term spillover were counted.

The scoring for both of the spillover factors (purchase and use) were conducted as follows:

Table 21. CFL confidence spillover scoring percentage

Much more confident	50% credit on follow-up purchases
More confident	25% credit for follow-up purchases
About the same level of confidence	zero % (0) credit for follow up purchases
Less confident	zero % (0) credit for follow up purchases
Much less confident	zero % (0) credit for follow up purchases

Using this scoring approach, if the participants indicated that their level of confidence was unchanged or less, no credit for a market effect is provided even if they followed up and purchased additional CFLs after receiving their Duke Energy CFLs and even if they indicated that the program increased the likelihood that they would purchase additional CFLs in the future as a result of the receipt and use of the Duke Energy CFL.

Table 22. CFL spillover percentage

	Confidence to use CFLs in future	Confidence to buy CFLs in future
Much more confident (.5 points)	39%	46%
More confident (.25 points)	28%	30%
About the same/ less confident or much less confident (zero points)	33%	24%
Total	100%	100%

The respondents who purchased addition bulbs indicated that they had purchased an addition 307 CFL bulbs after their acquisition of the Duke Energy CFLs. Applying the approach specified above on a per participant basis (see appendix for an extrapolated table of this algorithm) indicates that an additional 234 of these bulbs were purchased as a result of the customers experience with the Duke Energy CFLs. The remaining 73 spillover bulbs (307 – 234 = 73) purchased were not influenced by the Duke Energy CFLs. That is, on average, across the 149 participants who could answer the survey freeridership and spillover responses, the Duke Energy CFL experience caused the typical participant to buy an additional 1.7 net CFLs between their acquisition of the Duke Energy CFLs and the evaluation survey (approximately 1 month).

Duke Energy customers surveyed in this study who could answer the freeridership and spillover questions acquired 736 net CFLs via the Duke Energy program and an additional 234 net bulbs via short term spillover for a total of 970 net bulbs. Together, the total bulbs acquired by the population who could provide responses to the freeridership questions (n=149) had acquired 908 gross program bulbs, plus an additional 307 gross short-term spillover bulbs for a total of 1,215 gross bulbs. The following graphic displays the distribution of the number of participants and their spillover characteristics.

As a result of this analysis we conclude that the net to gross ratio for the program, including adjustments for freeriders and short term spillover is 1.07 as reflected in the following table.

Table 23. CFL Net to Gross Ratio

Acquired via	Gross bulbs	Net Bulbs	NTG ratio
Duke Energy Program	908	736	.81
Spillover	307	234	1.32
Totals	1215	970	1.07

Note: the NTG ratio for the spillover effects are added to the program's NTG ratio because the spillover bulbs are acquired as a result of the short term market effects of the program. That is, they are acquired at no cost to the program, yet the benefits are acquired because of the efforts of the program. Because this analysis is conservative, that is it does not include adjustments for the three types of bias or the market transformation benefits of adding the longer-term market effects bulbs, it is likely that the net to gross ratio for the program is higher than 1.07 if the longer term benefits and adjustments could be made.

Impact Evaluation

The savings presented in this section were calculated using survey data from participants in the 2010 CFL campaigns. Customers provided data describing their installation of the CFL bulbs purchased with Duke Energy coupons. This data was supplemented with lighting logger data collected from participants' homes during the month of September 2010. These two data sets were combined to calculate the per-bulb savings for this program.

Self Reported CFL Data

Customers who returned surveys indicating their participation in the CFL program (some of whom also participated in the lighting logger study) were asked to indicate where the CFL bulbs they purchased were installed, what wattage of bulb the CFLs replaced, and approximately how many hours the bulbs were used each day. Table 24 below presents the responses from the 256 survey responses obtained from those that redeemed the CFL coupons in North Carolina.

Table 24. NC CFL Redeemer Survey: Self Reported Location of Purchased Bulbs, n=256

Room	Total	% of Total
Living room	36	14.1%
Master bedroom	30	11.7%
Dining room	25	9.8%
Kitchen	25	9.8%
Bathroom	40	15.6%
Hall	29	11.3%
Other Bedroom	54	21.1%
Basement	3	1.2%
Other	14	5.5%
Total	256	

Table 25 below presents the responses from the 65 survey responses obtained from those that redeemed the CFL coupons in South Carolina.

Table 25. SC CFL Redeemer Survey: Self Reported Location of Purchased Bulbs, n=65

Room	Total	% of Total
Living room	11	16.9%
Master bedroom	8	12.3%
Dining room	5	7.7%
Kitchen	8	12.3%
Bathroom	12	18.5%
Hall	5	7.7%
Other Bedroom	14	21.5%

Basement	0	0.0%
Other	2	3.1%
Total	65	

The survey asked the participant the watts of the incandescent lamp removed and the watts of the CFL installed. These data provided a distribution of the CFL sizes installed and the ratio of the baseline watts to the CFL watts. These data are shown below.

Table 26. NC CFL Redeemer Survey: Self Reported CFL Replacement Watts, n=229

Watts Replaced	Count	Average CFL Size	Ratio
40	10	13.50	1.96
60	178	13.45	3.46
75	21	20.00	2.75
100	20	21.85	3.58
Total	229		

Table 27. SC CFL Redeemer Survey: Self Reported CFL Replacement Watts, n=65

Watts Replaced	Count	Average CFL Size	Ratio
40	13	13.27	2.01
60	51	15.31	2.92
75	0	20.00	2.75
100	1	21.85	3.58
Total	65		

Note, due to small samples in South Carolina, the wattage ratio from North Carolina was used for the 75 and 100 watt lamps in South Carolina.

Lighting Logger Study

In conjunction with the surveys, a lighting logger study was performed with a subset of customers who returned the CFL redeemer survey. The purpose of this logger study was to determine how customers who redeem Duke Energy coupons are using CFL bulbs (i.e., what room or fixture are the bulbs installed in), as well as to determine the actual hours of use of these CFL bulbs. Customers who indicated on their survey that they were interested in participating in the lighting logger study were contacted by an outside market research firm to determine the customers' interest and availability to participate in the study. Duke Energy field technicians then set up appointments with the customer to install the lighting loggers.[6] The loggers remained in place for approximately three weeks during the month of September[7], and then were removed

[6] The technicians were identified as Duke Energy representatives by their Duke Energy badges, Duke Energy clothing, and the Duke Energy magnets on their vehicles. All field technicians received proper employment screening prior to conducting this field work.
[7] Since the loggers were installed near the autumnal equinox, no daylength adjustment was made.

by the field technicians at follow up appointments. Customers received a $50 incentive for participating in the study. In total, 156 lighting loggers were installed across 34 homes. Logger installations were limited to homes in North Carolina.

The average daily hours of operation by room and daytype are shown in Table 28.

Table 28. Logger Study: Hours of Use by Room and Daytype

Room Type	Weekday Hours	Weekend Hours	Average
Living room	4.30	4.12	4.24
Master bedroom	1.71	1.81	1.74
Dining room	4.46	5.09	4.66
Kitchen	3.95	4.19	4.03
Bathroom	2.20	2.18	2.19
Hall	0.34	0.72	0.46
Other Bedroom	1.71	1.81	1.74
Basement	1.50	1.50	1.50
Other	2.03	2.18	2.07

The operating hours by room type were projected into the survey data showing quantity of lamps installed in each room to estimate the overall average CFL operating hours. Since the distribution of lamps across the room types varied by state, the average operating hours by state are shown in Table 29. With the exception of basements, every room type's hours of use are associated with the appropriate logger study data. Self reported values were used for basements because no logger data was present. The "other" room type's hours of use is defined as the household average.

Table 29. Logger Study: Average Hours of Use by State

State	Average Hours per Day
North Carolina	2.54
South Carolina	2.67

Load Shape

The average load shape for CFL use by daytype is shown in Figure 10. The average fraction of the CFLs that are in operation during each hour is plotted for weekdays and weekends. Note: the scale for hours is based on an "hours ending" convention, so hour 1 represents the average fraction of lamps in the hour that ends at 1am (e.g. midnight to 1am).

The coincidence factor is defined as the fraction of CFLs in operation during the hour coincident with the utility peak. At 4pm on a weekday, the percent of lamps in operation is 12.3%, thus the CFL coincidence factor is 0.123.

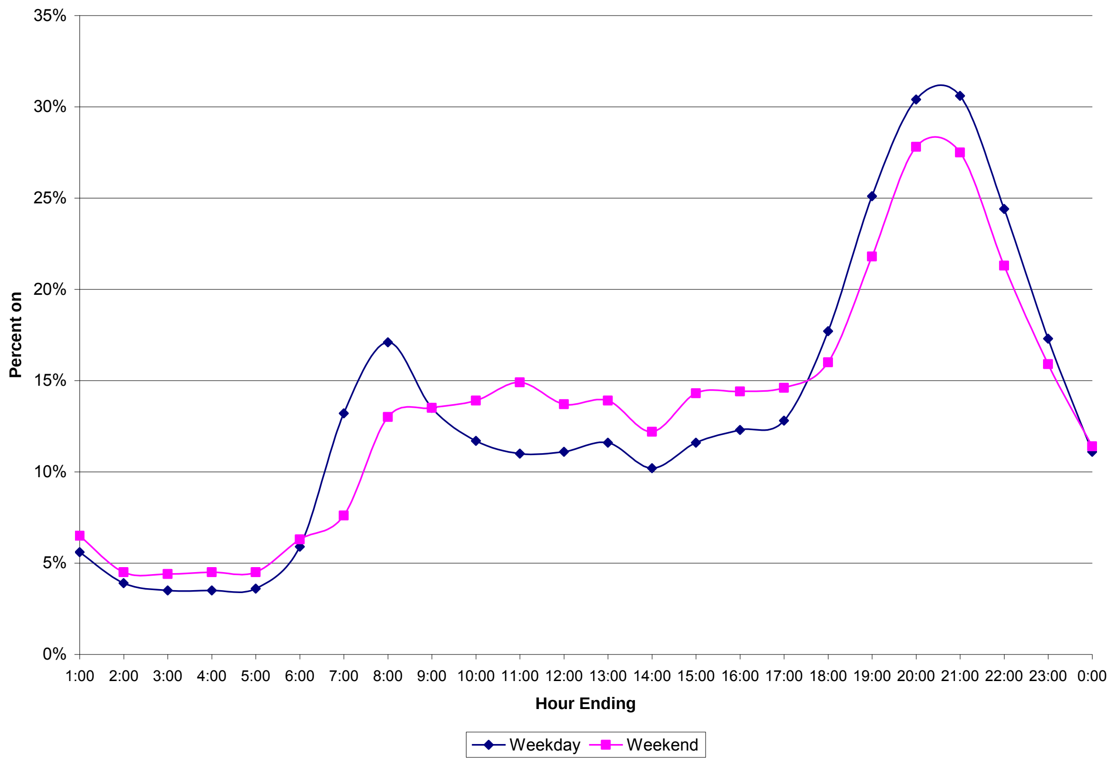


Figure 10. Average Daily Load Shape by Daytype

Program Savings

The total gross kWh savings for the sample was calculated as follows:

$$\Delta kWh = \sum_{i=1}^{room}\sum_{j=1}^{size}\left[quantity_{i,j} \times \left(Watts_{base,j} - Watts_{cfl,j}\right) \times hr_i \times 365\right]$$

where:

ΔkWh	= total kWh savings for sample
i	= index on room type
j	= index on base lamp size
$quantity_{i,j}$	= quantity of lamps of size j installed in room type i
$Watts_{base,j}$	= base lamp watts (40, 60, 75, 100)
$Watts_{cfl,j}$	= cfl watts corresponding to each base lamp watt
hr_i	= average hours per day by room type

The total gross kW savings for the sample was calculated as follows:

$$\Delta kW = \sum_{j=1}^{size} quantity_j \times (Watts_{base,j} - Watts_{cfl,j}) \times CF$$

where:

CF = coincidence factor (0.123)

The average savings per lamp was calculated simply by dividing the total kWh and kW savings by the number of lamps in the sample:

$$\Delta kWh/lamp = \frac{\Delta kWh}{quantity}$$

$$\Delta kW/lamp = \frac{\Delta kW}{quantity}$$

The total gross program savings were estimated from the average savings per lamp, the total number of rebated lamps, and the in-service rate. Since some lamps are put into storage, and others are used to replace other CFLs, the in-service rate is an estimate of the fraction of total lamps purchased that ultimately replace an incandescent lamp.

$$\Delta kWh_{gross,program} = \Delta kWh/lamp \times quantityredeemed \times ISR$$

$$\Delta kW_{gross,program} = \Delta kW/lamp \times quantityredeemed \times ISR$$

The in-service rate is estimated from the initial fraction of lamps installed, the lifetime number of lamps that are installed and the fraction of lamps initially in storage that are used to replace incandescent lamps:

ISR = $F_{initial}$ + ($F_{lifetime}$ – $F_{initial}$) x F_{incand}

where:

$F_{initial}$ = fraction of purchased lamps initially installed
$F_{lifetime}$ = fraction of lamps ultimately installed
F_{incand} = fraction of stored lamps used to replace an incandescent

The in-service rate for North Carolina and South Carolina participants is shown in Table 30.

Table 30. Data for In-Service Rate Calculation

Parameter	Value	Source
$F_{initial}$	0.86 (NC)	Survey data on number of CFLs

	0.87 (SC)	purchased and number of CFLs stored
$F_{lifetime}$	0.97	Ohio TRM[8]
F_{incand}	0.43	Ohio TRM[9]
ISR	0.91 (NC) 0.91 (SC)	Rounded result from calculation above

This analysis indicates that 42% of the lamps that initially went into storage will be used to replace an incandescent lamp, 3% will permanently remain in storage, and the remaining 55% will be used to replace a failed CFL.

The total program savings for North Carolina and South Carolina are shown in Table 31. Total coupon redemption and lamps per coupon data were obtained from Duke Energy. Net savings were estimated using the free rider and spillover fractions described in the preceding section.

Table 31. Total Program Savings for North Carolina and South Carolina

Metric	North Carolina	South Carolina
Total lamps redeemed	1,619,990	490,670
ISR	0.9053	0.9102
Gross kWh per lamp redeemed	42.4265	36.6900
Gross kW per lamp redeemed	0.0445513	0.0378810
Coincidence Factor	0.123	0.123
Gross Coincident kW per lamp redeemed	0.0055	0.0047
Total Gross Program MWh Savings	68,731	18,003
Total Gross Program kW Savings	72,173	18,587
Total Gross Program Coincident kW Savings	8,877	2,286
Free rider adjustment	0.81	0.81
Spillover adjustment	1.32	1.32
Net to gross ratio including spillover	1.07	1.07
Total Net Program MWh Savings (free riders only)	55,672	14,582
Total Net Program kW Savings (free riders only)	58,460	15,056
Total Net Program Coincident kW Savings (free riders only)	7,191	1,852
Net kWh per lamp redeemed (free riders only) (A)	34.37	29.72
Net kW per lamp redeemed (free riders only)	0.0361	0.0307
Net Coincident kW per lamp redeemed (free riders only)	0.0044	0.0038
Total Net Program MWh Savings (free riders plus spillover)	73,542	19,263
Total Net Program kW Savings (free riders plus spillover)	77,225	19,888
Total Net Program Coincident kW Savings (free riders plus spillover)	9,499	2,446
Net kWh per lamp redeemed (free riders plus spillover) (B)	45.40	39.26
Net kW per lamp redeemed (free riders plus spillover)	0.0477	0.0405
Net Coincident kW per lamp redeemed (free riders plus spillover)	0.0059	0.0050

[8] The Ohio Technical Reference Manual (TRM) references a study by Nexus Market Research, RLW Analytics and GDS Associates; "New England Residential Lighting Markdown Impact Evaluation," January 20, 2009.
[9] Ibid.

Measure life	5	5
Lifetime net MWh savings (free riders only)	278,359	72,911
Lifetime net MWh savings (free riders plus spillover)	367,708	96,314

(A): Net kWh per lamp redeemed, for the free riders only, is calculated using the total net program MWh savings (free riders only) divided by the total lamps redeemed.
(B): Net kWh per lamp redeemed, including both free riders and spillover, is calculated using the total net program MWh savings (free riders plus spillover) divided by the total lamps redeemed.
* While the advertised expected life of the installed CFLs is greater (10 years), recent research in California has indicated that CFL bulbs installed in typical rooms have switching behaviors that erode about half the advertized effective useful life. The adjustment approach for reducing the effective useful life to 5 years is presented in Appendix E: Effective Useful Life Adjustment Factor for Installed CFLs.

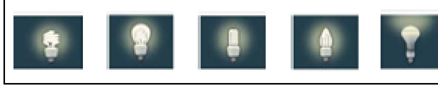
Appendix A: CFL Coupon Redeemer Survey

Duke Energy

Survey T. Est
123456 Does This Layout Work Rd.
Seems Like It Is, OK 55555

Dear Customer,

Duke Energy is continuously trying to improve our services for you. To help us improve the **Compact Fluorescent Light bulb** program, we would like your input. Please let us know what you think about the compact fluorescent light bulbs (CFLs) you purchased through our coupon promotion. Some examples of CFLs are in the pictures below. If you have any questions, please contact Duke Energy at mresearch@duke-energy.com.



WE WOULD LIKE YOUR OPINION ABOUT OUR COMPACT FLUORESCENT LIGHT BULB (CFL) COUPON PROGRAM. PLEASE FILL IN THE CIRCLES COMPLETELY USING BLUE OR BLACK INK.

Do you recall receiving Compact Fluorescent Light bulb (CFL) coupons from Duke Energy? ○ Yes ○ No

Did you give away any of your coupons to someone else to use? ○ Yes ○ No

Did you use at least one coupon yourself? ○ Yes – Continue this survey ○ No – Thank you. Please return survey.

How influential were the following in your decision to purchase CFL(s)?

	Very Influential	Somewhat Influential	Not at all Influential
The coupon from Duke Energy	○	○	○
In-store CFL displays and signs	○	○	○
Non-in-store advertising (TV, radio, newspaper, etc.)	○	○	○
Sales associates at the store	○	○	○
CFL Brand	○	○	○
Other advertising	○	○	○
Friends or family	○	○	○

At which store did you purchase your CFL bulbs using the Duke Energy coupons? ______________________________

Did you purchase any of the following items at the same time you purchased the CFLs with the Duke Energy coupons? Mark all that apply.

○ Wall or ceiling insulation ○ Faucet aerators ○ Low flow showerhead ○ Weatherstripping

○ Caulking ○ Electric wall outlet gaskets ○ Programmable thermostat ○ None of these

In this section of the survey, we would like to understand how you have used the CFL packs you purchased with the coupon(s).

	0	1	2	3	4	5	6	7-11	12+
How many CFL <u>bulbs</u> did you purchase in TOTAL with the Duke Energy coupon(s)?		○	○	○	○	○	○	○	○
How many CFL bulbs would you have bought if you had not had the Duke Energy coupon(s)?	○	○	○	○	○	○	○	○	○
How many CFL bulbs have you since purchased without Duke Energy coupons?	○	○	○	○	○	○	○	○	○

Of the CFLs you bought with the Duke Energy coupons:

	0	1	2	3	4	5	6	7-11	12+
How many CFLs are now installed?	○	○	○	○	○	○	○	○	○

For each CFL purchased with coupons that is now installed, please write in WHERE each CFL was installed, WHAT wattage the CFL is, WHAT wattage the old bulb was, and on average, HOW MANY HOURS you use that light each day.

	WHERE CFL INSTALLED	CFL WATTAGE	OLD BULB WATTAGE	HOW MUCH LIGHT IS USED (Hours Each Day)
Example	Living Room Floor Lamp	13Watt CFL	60Watt Incandescent	6 Hours Per Day (average)
Example	Hallway Ceiling Fixture	15Watt CFL	20Watt CFL	1 Hour Per Day (average)
Bulb 1	____	____	____	____
Bulb 2	____	____	____	____
Bulb 3	____	____	____	____
Bulb 4	____	____	____	____
Bulb 5	____	____	____	____
Bulb 6	____	____	____	____
Bulb 7	____	____	____	____
Bulb 8	____	____	____	____
Bulb 9	____	____	____	____
Bulb 10	____	____	____	____
Bulb 11	____	____	____	____
Bulb 12	____	____	____	____
Bulb 13	____	____	____	____
Bulb 14	____	____	____	____
Bulb 15	____	____	____	____

Have you changed the hours of use of any fixture in which you installed the CFLs? ○ Yes ○ No

If you answered yes, how did your average usage change? ○ Increased usage ○ Decreased usage

Have you removed any of the CFLs you installed? ○ Yes ○ No

	1	2	3	4	5	6	7-11	12+
If yes, how many did you remove?	○	○	○	○	○	○	○	○

Why did you remove them?

○ Not bright enough ○ Did not like the light ○ Too slow to start
○ Burned out ○ Not working properly ○ Other

If other, please specify:____

Did you have any CFLs installed in light sockets in your house before you bought the CFLs with the Duke Energy coupon? ○ Yes ○ No

	1	2	3	4	5	6	7-11	12+
If yes, about how many were already installed?	○	○	○	○	○	○	○	○

How long have you been using CFL light bulbs?

○ Never purchased a CFL until now ○ 1 year or less ○ 1 to 2 years ○ 2 to 3 years
○ 3 to 4 years ○ 4 or more years

	Very Satisfied	Somewhat Satisfied	Not at all Satisfied
Overall, how satisfied are you with the Duke discounted CFLs?	○	○	○

	Often	Sometimes	Never
Do you use the Duke Energy Website?	○	○	○
Have you added any major electrical appliances to your home in the past year?		○ Yes	○ No
Are you aware of the ENERGY STAR label?		○ Yes	○ No
Do you typically look for the ENERGY STAR label when purchasing an appliance?		○ Yes	○ No

Do you typically buy appliances with the ENERGY STAR label? ○ Yes ○ Some of the time ○ Never

CFL Purchasing

Considering future CFL purchases, how many CFL bulbs would you purchase in the next year if…

	0	1-2	3	4	5	6	7-11	12+
They were the same price as a standard bulb?	○	○	○	○	○	○	○	○
They were $1.00 more than standard bulbs?	○	○	○	○	○	○	○	○
They were $2.00 more than standard bulbs?	○	○	○	○	○	○	○	○
They were $3.00 more than standard bulbs?	○	○	○	○	○	○	○	○
They were free but you had to mail in a rebate form to get your money back?	○	○	○	○	○	○	○	○

General Information About Your Home

How would you best describe the type of home in which you live?

○ Detached single-family ○ Townhouse ○ Condominium ○ Duplex/2-family
○ Apartment ○ Manufactured home ○ Multi-Family (3 or more units)

In what year was your home built?

○ 1959 or before ○ 1960 - 1979 ○ 1980 – 1989 ○ 1990 - 1997
○ 1998 – 2000 ○ 2001 – 2007 ○ 2008 or later

What is the approximate square footage (heated area) of your home?

○ Less than 500 ○ 500-999 ○ 1,000-1,499 ○ 1,500-1,999
○ 2,000-2,499 ○ 2,500-2,999 ○ 3,000-3,499 ○ 3,500-3,999
○ 4,000 or more ○ Don't know

What range best describes your total annual household income?

○ Less than $25,000 ○ $25,000 to $49,999 ○ $50,000-$74,999 ○ $75,000-$100,000
○ Over $100,000 ○ Don't know ○ Prefer not to answer

How many people live in your home?

○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 or more

Do you own or rent your home?

○ Own ○ Rent

Primary heating fuel? ○ Electric ○ Gas ○ Oil ○ Propane ○ Other ○ None

Type of heating system?

○ Central furnace ○ Electric baseboard ○ Heat pump

○ Geo-thermal heat pump ○ Hot water or steam boiler ○ Other ○ Do not have

Age of heating system in years?

○ 0-4 ○ 5-9 ○ 10-14

○ 15-19 ○ >19 ○ Don't know ○ Do not have

Primary cooling fuel? ○ Electric ○ Gas ○ Oil ○ Propane ○ Other ○ None

Type of cooling system?

○ Central air conditioner ○ Window/Room unit air conditioner ○ Heat pump (for cooling)

○ Geo-thermal heat pump ○ Other ○ No cooling system

Age of cooling system in years?

○ 0-4 ○ 5-9 ○ 10-14

○ 15-19 ○ >19 ○ Don't know ○ Do not have

HAVE A CHANCE TO PARTICIPATE IN THE DUKE ENERGY LIGHTING STUDY

Would you be interested in participating in a lighting study in July and August 2009?

A Duke Energy representative would place small lighting monitors on 4 or 5 light fixtures which would remain in place for 2 to 3 weeks. The monitors are smaller than the size of a bar of soap and help us measure how often lights are turned on and off during the week. The first 100 returned surveys indicating interest will be contacted. Eligible customers that are selected will receive $50 for participating.

If yes, you may receive a follow-up phone call about this lighting study in July.

○ **Yes, I am interested in participating. My phone number is: __________________________________.**

○ **My address on the front page of this survey is correct.**

○ **My address is:**

____

○ No, I am not interested in participating.

THANK YOU FOR YOUR RESPONSES

Appendix B: Smart $aver® CFL Management Interview Instrument

Name: ____

Title: ____

Position description and general responsibilities:

____

____

____

We are conducting this interview to obtain your opinions about and experiences with the Smart $aver® CFLs program. We'll talk about the Smart $aver® CFLs Program and its objectives, your thoughts on improving the program, and the technologies the program covers. The interview will take about an hour to complete. May we begin?

Program Objectives

1. In your own words, please describe the Smart $aver® CFL Program's current objectives. How have these changed over time?

2. In your opinion, which objectives do you think are best being met or will be met?

3. Are there any program objectives that are not being addressed or not being addressed as well as possible or that you think should have more attention focused on them? If yes, which ones? How should these objectives be addressed? What should be changed?

4. Should the program objectives be changed in any way due to technology-based, market-based, or management based conditions? What objectives would you change? What program changes would you put into place as a result, and how would it affect the operations of the program?

Operational Efficiency

5. Please describe your role and scope of responsibility in detail. What is it that you are responsible for as it relates to this program? When did you take on this role? *If a recent change in management…*Do you feel that Duke Energy gave you enough time to adequately prepare to manage this program? Did you get all the support that you needed to manage this program?

6. Please review with us how the Smart $aver® CFL Program operates relative to your duties, that is, please walk us through the processes and procedures and key events that allow you do currently fulfill your duties.

7. Have any recent changes been made to your duties? If so, please tell us what changes were made and why they were made. What are the results of the change?

8. Describe the evolution of the Smart $aver® CFL Program. How has the program changed since it was it first started?

9. Do you have suggestions for improvements to the program that would increase participation rates or interest levels?

10. Do you have suggestions for improving or increasing energy impacts?

11. Do you have suggestion for the making the program operate more smoothly or effectively?

12. *(If not captured earlier)* Please explain how the interactions between the retailers, customers and the Smart $aver® CFL management team work. Do you think these interactions or means of communication should be changed in any way? If so, how and why?

13. Describe your quality control and tracking process.

14. Are key industry experts, trade professionals or peers used for assessing what the technologies or models should be included in the program? If so, how does this work?

15. Are key industry experts and trade professionals used in other advisory roles? If so how does this work and what kind of support is obtained?

16. Describe the Smart $aver® CFL retailer program orientation training and development approach. Are retailers getting adequate program information? What can be done that could help improve retailer effectiveness? Can we obtain any informational materials that are being used?

17. What market information, research or market assessments are you using to determine the best target markets or market segments to focus on?

18. What market information, research or market assessments are you using to identify market barriers, and develop more effective delivery mechanisms?

19. Overall, what about the Smart $aver® CFL program works well and why?

20. What doesn't work well and why? Do you think this discourages participation or interest?

21. Can you identify any market, operational or technical barriers that impede a more efficient program operation?

22. In what ways can these operations or operational efficiencies be improved?

23. In what ways can the program attract more vendors?

24. In what ways can the program attract more consumer participation?

25. How do you make sure that the best information and practices are being used in Smart $aver® CFL operations?

26. *(If not collected above)* What market information, research or market assessments are you using to determine the best target markets and program opportunities, market barriers, delivery mechanisms and program approach?

27. If you could change any one thing about the program, what would you change and why?

28. Are there any other issues or topics you think we should know about and discuss for this evaluation?

Appendix C: Smart $aver® CFL Retailer Management Instrument

Name: ____

Title: ____

Position description and general responsibilities:

____

____

____

We are conducting this interview to obtain your opinions about and experiences with the Smart $aver® CFL program. We'll talk about your understanding of the Smart $aver® CFL Program and its objectives, your thoughts on improving the program, and the technologies the program covers. The interview will take about 20-30 minutes to complete. May we begin?

Understanding the Program

We would like to ask you about your understanding of the Smart $aver® CFL program. We would like to start by first asking you to…

1. Please review for me how you are involved in the program and the steps you take in the participation process. Walk me though the typical steps you take to introduce the program to the customer, and what you do to help a customer become eligible for this program. What do you do to receive or help the customer receive the program incentive?

2. What kinds of problems or issues have come up in the Smart $aver® CFL program?

3. Have you heard of any customer complaints that are in any way associated with this program? Have callbacks increased due to the program technologies?

Program Design and Design Assistance

4. Do you feel that the proper technologies and equipment are being covered through the program?

5. Are the coupon levels appropriate?

6. Are there other technologies or energy efficient products that you think should be included in the program?

7. Are there components that are now included that you feel should not be included? What are they and why should they not be included?

Reasons for Participation in the Program

We would like to better understand why retailers/distributors become partners in the Smart $aver® CFL Program.

8. How long have you been a partner in the Smart $aver® CFL Program?

9. What are your primary reasons for participating in the program? Why do you continue to be a partner?…. *If prompts are needed*… Is this a wise business move for you, is it something you believe in professionally, is it that it provides a service to your customers, or other reasons?

10. Has this program made a difference in your business? How? Are your primary reasons for participation being met? Why/why not?

11. How do you think Duke Energy can get more distributors/retailers to participate in this program?

Program Participation Experiences

The next few questions ask about the process for participation.

12. Do you think the process could be streamlined in any way? How?

13. Do you have the right amount of materials such as information sheets, brochures or marketing materials that you need to effectively show and sell the CFLs covered by the coupons? What else do you need?

14. Overall, what about the Smart $aver® CFL Program do you think works well and why?

15. What changes would you suggest to improve the program?

16. Do you feel that communications between you and Duke's program staff is adequate? How might this be improved?

17. What specific benefits do you receive as a result of participating in Duke's Smart $aver® CFL Program or from selling Smart $aver® CFLs?

18. What do you think are the primary benefits to the people who buy Smart $aver® CFLs?

19. Are there other benefits that are important to a potential customer? What are these?

Market Impacts and Effects

21. How do you make customers aware of the CFL Program?

22. What percent of the customers are already aware of the program before you present it to them? What percent of the customers take advantage of the program after you present it and explain it to them?

23. Are customers more satisfied with this equipment? Why or why not?

24. Do you market or sell the Smart $aver® CFL differently than your other products? How?

25. What percent of your customers end up buying the CFL instead of an incandescent because of the coupon?

Recommended Changes from the Participating Contractors

27. Are there any other changes that you would recommend to Duke Energy for their Smart $aver® CFL Program that we have not already discussed?

28. If you could make any changes you wanted to the CFL program, what would you do differently?

Standard Practice vs. Smart $aver® CFL Practices

We would like to know what your presentation and sales practices were before your involvement in the Smart $aver® CFL program, and how you would offer your products without the program.

29. If the program were to be discontinued, would you still offer the CFLs? If yes, would you structure pricing differently? If yes, how?

30. How did the Smart $aver® CFL program change how you present and sell energy efficient light bulbs?

31. In your opinion is the Smart $aver® CFL program still needed? Why?

Appendix D: Spillover Algorithm Table

North and South Carolina Spillover Algorithm Table				
Survey ID	Number of additional bulbs purchased	Spillover confidence factor mmc=.5, mc=.25,	Spillover Influence factor: mmc=.5, mc=.25	Net Spillover effect
1	0	0.5	0.5	0.0
2	0	0	0	0.0
3	0	0	0.25	0.0
4	0	0.25	0.25	0.0
5	0	0.5	0.5	0.0
6	9	0.5	0.5	9.0
7	2	0.5	0.25	1.5
8	0	0.5	0	0.0
9	8	0.25	0.25	4.0
10	1	0	0	0.0
11	0	0.5	0.5	0.0
12	12	0.5	0.5	12.0
13	0	0	0	0.0
14	0	0	0	0.0
15	0	0.25	0.25	0.0
16	0	0.25	0.25	0.0
17	0	0.5	0.5	0.0
18	4	0.25	0.25	2.0
19	9	0.5	0.5	9.0
20	0	0.5	0.5	0.0
21	2	0.5	0.25	1.5
22	0	0	0	0.0
23	0	0.25	0.5	0.0
24	0	0.5	0.5	0.0
25	0	0	0.25	0.0
26	9	0.5	0.5	9.0
27	2	0.25	0.25	1.0
28	0	0	0	0.0
29	3	0.25	0.25	1.5
30	0	0.5	0.5	0.0
31	3	0.5	0.5	3.0
32	0	0	0.25	0.0
33	0	0	0	0.0
34	4	0.25	0.5	3.0
35	0	0	0	0.0
36	0	0	0	0.0
37	0	0.25	0	0.0
38	6	0.25	0.5	4.5
39	4	0	0.25	1.0
40	4	0.5	0.5	4.0
41	0	0.5	0.5	0.0
42	1	0	0.25	0.3
43	4	0	0.25	1.0

44	0	0	0	0.0
45	6	0.5	0.5	6.0
46	0	0.5	0.5	0.0
47	0	0	BLANK	0.0
48	0	0.5	0.5	0.0
49	0	0.5	0.5	0.0
50	0	0.25	0.5	0.0
51	0	0	0	0.0
52	4	0.5	0.5	4.0
53	0	0.5	0.5	0.0
54	0	0	0.25	0.0
55	5	0.5	0.5	5.0
56	0	0.5	0.5	0.0
57	9	0.25	0.25	4.5
58	0			0.0
59	0	0	0.25	0.0
60	0	0	0	0.0
61	9	0.5	0.5	9.0
62	0	0	0	0.0
63	0	0	0	0.0
64	0	0	0.25	0.0
65	4	0	0	0.0
66	0	0	0.25	0.0
67	0	0	0	0.0
68	0	0	0	0.0
69	4	0.25	0.25	2.0
70	0	0	0	0.0
71	0	0.25	0.5	0.0
72	2	0.5	0.5	2.0
73	0	0.5	0.5	0.0
74	0	0.25	0.25	0.0
75	4	0.25	0.25	2.0
76	0	0.5	0.5	0.0
77	0	0	0.25	0.0
78	0	0.25	0.25	0.0
79	2	0	0.25	0.5
80	9	0.5	0.5	9.0
81	0	0.5	0.5	0.0
82	0	0	0	0.0
83	0	0.5	0.5	0.0
84	9	0.5	0.5	9.0
85	0	0	0	0.0
86	0	0.25	0.5	0.0
87	4	0	0.5	2.0
88	0	0	0.25	0.0
89	0	0.5	0.5	0.0
90	3	0	0.25	0.8
91	0	0.25	0.25	0.0
92	0	0.25	0.25	0.0

93	0	0	0	0.0
94	0	0.5	0.5	0.0
95	0	0.5	0.5	0.0
96	0	0.25	0.5	0.0
97	0	0	0	0.0
98	6	0.25	0.25	3.0
99	15	0.25	0.25	7.5
100	9	0.25	0.25	4.5
101	0	0.5	0.5	0.0
102	0	0	0	0.0
103	0	0.5	0.5	0.0
104	1	0.5	0.5	1.0
105	0	0.25	0.25	0.0
106	0	0.25	0.25	0.0
107	9	0.5	0.5	9.0
108	2	0.5	0.5	2.0
109	2	0.5	0.5	2.0
110	0	0.25	0.25	0.0
111	9	0.25	0.5	6.8
112	6	0.5	0.5	6.0
113	0	0	0	0.0
114	8	0.5	0.5	8.0
115	0	0	0.25	0.0
116	0	0	0	0.0
117	3	0	0	0.0
118	0	0.5	0.5	0.0
119	0	0.25	0	0.0
120	6	0.25	0.5	4.5
121	4	0.5	0.5	4.0
122	0	0	0.25	0.0
123	0	0	0	0.0
124	4	0.5	0.5	4.0
125	4	0.25	0.5	3.0
126	9	0.5	0.5	9.0
127	6	0.5	0.5	6.0
128	5	0.5	0.5	5.0
129	9	0.25	0.25	4.5
130	1	0.25	0.25	0.5
131	0	0.5	0.5	0.0
132	4	0.25	0.5	3.0
133	0	0	0	0.0
134	4	0.5	0.5	4.0
135	0	0.5	0.5	0.0
136	0	0	0	0.0
137	6	0.25	0.5	4.5
138	0	0.25	0.25	0.0
139	6	0.25	0.25	3.0
140	0	0	0	0.0
141	2	0.25	0.25	1.0

142	0	0.25	0	0.0
143	2	0.25	0.25	1.0
144	0	0.5	0.5	0.0
145	4	0.5	0.5	4.0
146	0	0.5	0.5	0.0
147	0	0	0	0.0
148	0	0.5	0.5	0.0
149	0	0.5	0.5	0.0
Gross spillover	307		Net spillover	233.75

Appendix E: Effective Useful Life Adjustment Factor for Installed CFLs

The energy savings calculated in this study use a reduced effective useful life (EUL) for the program-incented CFLs instead of the period advertised by the manufactures. The reduction in the EUL is consistent with the results of the EUL of CFLs used in switched environments representative of the typically residential in-door installations. The adjustment used in this report is 0.523 of the advertised EUL for the installed bulbs. This adjustment is presented in the Excel spreadsheet table below for each of the rooms in which the bulbs have been reported to be installed by the customers and the adjusted hours of use of those bulbs as indicated by the Duke Energy lighting logger study.

It is anticipated that this adjustment may be less dramatic in the future as additional studies of newly manufactured (more reliable technologies) bulbs are conducted, if the newer generation of CFLs are less impacted by in-house switching behaviors. However, at this time, the results of the California DEER Effective Useful Life Study and other research (see references below) indicate that advertised EULs are about twice what can be expected from the CFLs once installed in homes and turned on and off consistent with typical applications.

Room	Self Reported	Actual Daylength Adjusted	Difference (Self Rep - Actual)	%	Weight (from # of self reports)	Weighted Percentages		wt * actual hours	EUL = Rated Life of Lamp (10000 hours) * Switching Degredation Factor (indoor only) / Annual usage
Basement	3.157	2.681	0.476	17.77%	0.104222	1.85%		0.279419182	
Bathroom	2.27	0.877	1.393	158.84%	0.097625	15.51%		0.085617125	
Bedroom	2.134	1.955	0.18	9.19%	0.216359	1.99%		0.422981845	
Den	4	0.685	3.315	483.54%	0.015831	7.66%		0.010844235	
Dining Roo	1.76	2.538	-0.778	-30.65%	0.040897	-1.25%		0.103796586	
Entryway	1.167	2.099	-0.932	-44.42%	0.011873	-0.53%		0.024921427	
Garage	1.289	1.105	0.185	16.71%	0.025066	0.42%		0.02769793	
Hallway	2.358	3.522	-1.164	-33.04%	0.067282	-2.22%		0.236967204	
Kitchen	4.735	3.415	1.319	38.63%	0.151715	5.86%		0.518106725	
Living Roo	3.622	3.85	-0.228	-5.92%	0.242744	-1.44%		0.9345644	
Office	3.294	9.001	-5.707	-63.40%	0.022427	-1.42%		0.201865427	
Stairway	3.5	0.538	2.962	550.99%	0.003958	2.18%		0.002129404	
			Average	91.52%	0.999999	28.60%		2.84891149	
						rated life	10000		Rated life varies from 8000 (Lowes) to 12000 (Wallmart). Use average of 10000
						Hr/day	2.85		Wt average from table above
						hr/yr	1040.25		
						adj facto	0.523		From California DEER EUL study
						EUL	5.027638		

References:
www.deeresources.com (California's deemed database and database resource site, CFL EUL multiplier for in-door residential applications).

Proceedings of the ACEEE Summer Study, 2008, *The Dark and the Bright: Effectiveness Issues for CFL Programs*, Corina Jump, Jane Peters, Dulane Moran, James Hirsh, Shahana Samiullah.

Final Report

Evaluation of the Non-Residential Smart Saver Prescriptive Program in North and South Carolina

Results of a Process and Impact Evaluation

Prepared for
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139 East Fourth Street
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February 6, 2011

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Executive Summary

Summary of Findings

This Executive Summary provides an overview of the key findings identified through this evaluation.

Significant Process Evaluation Findings

- The trade allies and commercial customers would like to have the prescriptive program application process available online. This would make the program operate more smoothly for both Duke Energy staff and the Smart $aver® partnering trade allies and would speed accessibility to the participation process and eliminate problems with obtaining hard-copy application forms and transmitting them via fax.

- The trade allies are disappointed that Duke Energy's bonus incentive was eliminated as a benefit to these customers because they said that it was an effective selling point for them to use with their customers in terms of return on investment. Trade allies suggest that more net savings can be acquired with the bonus incentive than without it.

- The trade allies would like an increase in collaborative marketing between Duke Energy and the trade allies to raise awareness of the program. To achieve this they suggested that Duke Energy provide more literature on the program to the trade allies and to a list of targeted contacts supplied by trade allies. Several trade allies also would like to see Duke Energy initiate a preferred vendor program for the Non-Residential Smart $aver® Program.

Significant Impact Evaluation Findings

- Even though these algorithms are not the source of record for program impact calculations, the measure savings algorithms in the third-party program tracking database contain errors. Program accomplishments should be tracked using measure counts from the program tracking database and unit energy savings from program design calculations contained within DSMore until the errors can be corrected. Duke Energy was aware of this problem, and steps will be taken to correct this issue.

- Customer self-reported fixture watts for new and replaced fixtures are inconsistently reported and proving to be unreliable. We suggest removing this information from the applications to reduce customer burden.

- Energy and demand savings realization rates for kWh and kW for high bay lighting were very close to 1.0, indicating the program planning estimates provide a good indication of average high bay lighting participant savings.

A summary of the impact findings is presented in the standardized Duke Energy Program Impact Metrics Table below:

Table ES-1 Program Impact Metrics Summary for North Carolina

Metric	Result
Number of Program Participants from 6-1-2009 to 4-30-2010	23,600 fixtures
Gross kW per fixture	kW/fixture
High Bay 2L T-5 High Output	0.122
High Bay 3L T-5 High Output	0.141
High Bay 4L T-5 High Output	0.278
High Bay 6L T-5 High Output	0.118
High Bay 8L T-5 High Output	0.825
High Bay Fluorescent 4 Lamp (F32 Watt T8)	0.194
High Bay Fluorescent 6 Lamp (F32 Watt T8)	0.303
High Bay Fluorescent 8 Lamp (F32 Watt T8)	0.204
Gross kWh per fixture	kWh/fixture
High Bay 2L T-5 High Output	774
High Bay 3L T-5 High Output	902
High Bay 4L T-5 High Output	1,773
High Bay 6L T-5 High Output	752
High Bay 8L T-5 High Output	5,268
High Bay Fluorescent 4 Lamp (F32 Watt T8)	1,238
High Bay Fluorescent 6 Lamp (F32 Watt T8)	1,932
High Bay Fluorescent 8 Lamp (F32 Watt T8)	1,304
Gross therms per fixture	N/A
Freeridership rate	30%
Spillover rate	
Self Selection and False Response rate	
Total Discounting to be applied to Gross values	30%
Net kW per fixture	kW/fixture
High Bay 2L T-5 High Output	0.085
High Bay 3L T-5 High Output	0.099
High Bay 4L T-5 High Output	0.194
High Bay 6L T-5 High Output	0.083
High Bay 8L T-5 High Output	0.578
High Bay Fluorescent 4 Lamp (F32 Watt T8)	0.136
High Bay Fluorescent 6 Lamp (F32 Watt T8)	0.212
High Bay Fluorescent 8 Lamp (F32 Watt T8)	0.143
Net kWh per fixture	kWh/fixture
High Bay 2L T-5 High Output	542
High Bay 3L T-5 High Output	632
High Bay 4L T-5 High Output	1,241
High Bay 6L T-5 High Output	526
High Bay 8L T-5 High Output	3,688
High Bay Fluorescent 4 Lamp (F32 Watt T8)	867
High Bay Fluorescent 6 Lamp (F32 Watt T8)	1,352
High Bay Fluorescent 8 Lamp (F32 Watt T8)	913
Net therms per fixture	N/A
Measure Life	10

Table ES-2 Program Impact Metrics Summary for South Carolina

Metric	Result

Metric	Result
Number of Program Participants from 6-1-2009 to 4-30-2010	12,615 fixtures
Gross kW per fixture	kW/fixture
High Bay 2L T-5 High Output	0.097
High Bay 3L T-5 High Output	0.112
High Bay 4L T-5 High Output	0.220
High Bay 6L T-5 High Output	0.094
High Bay 8L T-5 High Output	0.655
High Bay Fluorescent 4 Lamp (F32 Watt T8)	0.154
High Bay Fluorescent 6 Lamp (F32 Watt T8)	0.240
High Bay Fluorescent 8 Lamp (F32 Watt T8)	0.162
Gross kWh per fixture	kWh/fixture
High Bay 2L T-5 High Output	616
High Bay 3L T-5 High Output	718
High Bay 4L T-5 High Output	1411
High Bay 6L T-5 High Output	598
High Bay 8L T-5 High Output	4194
High Bay Fluorescent 4 Lamp (F32 Watt T8)	986
High Bay Fluorescent 6 Lamp (F32 Watt T8)	1538
High Bay Fluorescent 8 Lamp (F32 Watt T8)	1038
Gross therms per fixture	N/A
Freeridership rate	30%
Spillover rate	
Self Selection and False Response rate	
Total Discounting to be applied to Gross values	30%
Net kW per fixture	kW/fixture
High Bay 2L T-5 High Output	0.068
High Bay 3L T-5 High Output	0.079
High Bay 4L T-5 High Output	0.154
High Bay 6L T-5 High Output	0.066
High Bay 8L T-5 High Output	0.459
High Bay Fluorescent 4 Lamp (F32 Watt T8)	0.108
High Bay Fluorescent 6 Lamp (F32 Watt T8)	0.168
High Bay Fluorescent 8 Lamp (F32 Watt T8)	0.114
Net kWh per fixture	kWh/fixture
High Bay 2L T-5 High Output	431
High Bay 3L T-5 High Output	503
High Bay 4L T-5 High Output	988
High Bay 6L T-5 High Output	419
High Bay 8L T-5 High Output	2,936
High Bay Fluorescent 4 Lamp (F32 Watt T8)	690
High Bay Fluorescent 6 Lamp (F32 Watt T8)	1,076
High Bay Fluorescent 8 Lamp (F32 Watt T8)	727
Net therms per fixture	N/A
Measure Life	10

Recommendations

1. Evaluate the usefulness of a possible training webinar. Consider recording a webinar for future web access. A webinar may prove to be a benefit only if it is offered live, with a live question and answer period.

2. Explore the effectiveness of email and electronic campaigns and survey trade allies to determine the frequency with which they prefer to be contacted. Reports from the field suggest that trade allies may prefer the less-expensive email campaigns over mailed materials. This may allow the Non Res Smart $aver® to have a broader reach at a lower cost.

3. Duke Energy should consider the feasibility of providing more case studies on customers who have implemented energy efficiency projects using high-priority high-impact measures in program materials provided to trade allies for them to share with their customers. Duke Energy may wish to include case studies on customers from several market segments. If built correctly, such case studies would increase the understanding of the Smart $aver® program by customers in different market segments because they would have examples to which they can relate, lowering the perceived risk and uncertainty for new participants.

4. Duke Energy should explore the feasibility of developing a coordinated marketing campaign for one market segment, implementing it as a pilot, and evaluating its effectiveness. A small pilot would allow Duke Energy to assess whether targeting marketing to one segment would be a more effective approach for future program efforts.

5. Duke Energy and WECC should jointly share and discuss their technology selection processes. This would allow both parties to better provide feedback in order to make accurate estimates of market activity. This would also allow both Duke Energy and WECC to explain, if the trade allies ask, why certain technologies are not included.

6. WECC should provide timely feedback to Duke Energy about whether they believe the projected market activity levels provided by Duke Energy are realistic, based upon WECC's experience in the field. This would allow Duke Energy to use WECC's direct experience in the field to relay any upcoming customer purchasing trends.

7. If poor economic conditions are expected to impact customers' ability to take on retrofit projects, and if there is enough spread among the energy efficiency levels of equipment available to make offering multiple levels of efficiency a viable option, Duke Energy should assess whether it is feasible to test a tiered prescriptive program that would allow customers to still install energy efficient technologies when the highest efficiency models are priced out of their current means. However, Duke Energy should not trade off higher levels of free ridership in exchange for increased participation in a program that achieves lower levels of energy savings. It is possible that cost per achieved net kWh would be increased under such an offer depending on how the market would respond.

8. Explore whether it is feasible to create marketing and outreach campaigns that focus on lifecycle costs. This may allow customers to look beyond consideration

about a measure's capital cost and its incentive, and understand the energy savings that would be delivered over the measure's effective useful life.

9. Make the template for itemizing invoices available online. This guidance would allow trade allies and customers to send in more accurate applications that would be rejected less frequently and could be processed more quickly and cost effectively, without WECC needing to contact applicants for missing information.

10. Duke Energy should consider conducting usability studies and satisfaction surveys of the online application process. This may allow Duke Energy to quantify any reduction in application speed and any increase in customer satisfaction with the application process.

11. Duke Energy should consider the feasibility of designing, implementing, and evaluating a pilot program to help <500 kW customers to prioritize energy efficient projects. This may allow more Duke Energy customers to achieve greater savings by providing them with a more complete picture of their energy efficiency options.

12. Duke Energy should consider the potential benefits of increased market segment penetration if marketing were structured to specifically focus on barriers for a particular key market segment. Duke Energy may want to do this by identifying one high priority market and conducting a characterization study about that market. Duke Energy might then identify that market's specific barriers to participation and develop a logic model that specifies a strategic approach toward overcoming those barriers. Duke Energy can then evaluate the effectiveness of the approach at the end of the program cycle. This would allow Duke Energy to see if they would be able to successfully drive greater activity in a particular segment if there arose a need for doing so in the future.

Introduction

This report presents the results of a process and impact evaluation of the Non-Residential Prescriptive Smart Saver Program in North and South Carolina.

Program Description

The Non-Residential Smart Saver Prescriptive program seeks to reward businesses for saving energy by providing rebate incentives to install qualifying high-efficiency lighting, cooling or motors/pumps. Duke Energy's commercial and industrial customers fund this program by paying an energy efficiency rider based upon their kWh usage. The program has a custom component as well as the prescriptive component. This process evaluation study looks at the prescriptive program only. The custom program will not be evaluated here, but it works hand in hand with the prescriptive program. In the prescriptive program, customers may install selected energy efficient measures and then send in an application for rebates, up to 60 days after the installation. Energy efficiency measures that are not part of the prescriptive program may still earn a rebate, but the installation of these custom measures must first be approved by Duke Energy through an application process. Along with the Non Res Smart Saver program, there is also a Residential Smart Saver program that mainly involves prescriptive lighting and HVAC measures.

The prescriptive Non Res Smart Saver program was initially started as a limited-funds program that used ratepayer money. When the funds were depleted, the program ended. That has now been changed to an unlimited funds program because Duke Energy is allowed to reclaim program costs. The program has had several successes, but has not been meeting its goals.

About This Report

This report presents the results of a process and impact evaluation of Duke Energy's Non-Residential Smart Saver Program in North and South Carolina. The Smart Saver Program provides incentives to customers to upgrade to energy efficient lighting and commercial equipment. The study focuses on participants from program year 2009.

In order to better understand the program's operations and to identify possible areas of improvement, the evaluation team conducted nine in depth interviews with staff from Duke Energy, the Wisconsin Energy Conservation Corporation (WECC), and a technical consulting team.

This effort employed interviews with program trade allies and a survey of commercial customers using the program. To conduct the process evaluation we interviewed five trade allies and surveyed twenty program participants regarding twenty-five program measures. Contacts were selected randomly from the full population of trade allies and participants.

The second section provides findings from the impact evaluation efforts. The impact evaluation employed a tracking system review, onsite surveys and short term Measurement and Verification (M&V) of selected lighting fixtures using light loggers.

Process Evaluation

In order to better understand the program's operations and to identify possible areas of improvement, the evaluation team conducted nine in depth interviews with staff from Duke Energy, the Wisconsin Energy Conservation Corporation (WECC), and a technical consulting team. The results of these interviews follow.

Program Objectives

The program staff who were interviewed all were able to describe some of the multiple goals of the program.

- "Get as much participation as possible…get impacts so Duke will not have to build more power plants"
- "Drive the market toward more efficient solutions and applications"
- "Help through incentives to bring different and newer technologies to the market place.
- "To create sustainable energy savings within customer's facilities."
- "Lower the kW demand on their system."

Roles

Duke Energy

Duke Energy serves as the administrator of this program with WECC playing a key role in implementation. WECC processes applications, issues incentive checks, conducts installation verifications, and grows a network of vendors and trade allies who implement energy efficiency projects for the commercial and industrial customers. Duke Energy guides the strategic direction of the program using internal research as well as feedback from WECC. A technical consulting firm is brought into calculate program cost effectiveness, incentive levels, and projected market penetration.

WECC

WECC's development of a trade ally network relies upon the efforts of WECC's trade ally representatives. These WECC employees have program responsibilities in four areas: 1) physical meetings and outreach with vendors and trade allies, 2) recruitment of trade allies and vendors, 3) work with participating vendors to figure out the best energy efficiency project for specific customers, and 4) conduct physical verifications of measure installations[1].

WECC's Outreach Process

[1] There is some discrepancy in the use of the term "trade ally". Duke Energy uses "trade ally" to refer to WECC and "vendor" to refer to the distributors and sales people. WECC uses "trade ally" to refer to the distributors and vendors, and refer to themselves as trade ally representatives.

The WECC trade ally reps use a variety of tactics to conduct outreach. They look for opportunities in which they can actively promote the Smart Saver program. For example, one tactic some trade ally reps use is to try to meet with a distributor's sales force, in order to speak to as many people as once. Another rep mentioned that he would like to take advantage of more speaking opportunities such as the ones that are available at the chamber of commerce meetings.

> *"I look for opportunities to speak, see who is currently participating in the program and make sure they have a good experience and continue"*
>
> *"[I] touch base with new trade allies and see if they want me to come by and see them or if they have it under control."*

They see their responsibility as being able to provide any help necessary to trade allies who are filling out applications. *"When a trade ally is filling out an application, or has general questions, or wants to sign up, we drop what we're doing. The trade allies are our first and foremost priority."* Common questions from TAs include asking whether a particular customer or project is eligible and asking about the status of a check. WECC believes that the quickest and most cost effective way to get applications is to have the trade allies engaged. *"If your trades are not promoting the program, it's not on the mind of the customers.*

WECC recruits trade allies in a targeted approach: Duke Energy provides a list of trade ally prospects and the WECC trade ally reps' goals are based on the number of vendors they can recruit off that list. Recently, WECC was directed to place a higher priority on recruiting trade allies who have higher impact technologies such as HVAC and motors. This new focus will be discussed in detail later in this report. WECC keeps a scorecard on trade ally communications, applications, and recruitments. This is shared at the weekly conference call between Duke Energy and WECC. WECC management also conducts quarterly reviews with the trade ally reps. WECC management does "ride alongs" with the trade ally reps in order to provide feedback on issues such as the quality of their presentation, their product knowledge, and the number and quality of the calls they are making.

Trade Allies

A trade ally rep reported that there is currently no formal training for the trade allies. There previously was a training program but it was cancelled for reasons unknown to the rep. The rep would prefer to have a formal training program. "*We spend so much time reinventing the wheel with new trade allies"* The current informal process uses PowerPoint presentations that were developed by Duke Energy, and WECC only uses materials that have been approved by Duke.

Duke Energy has also designed brochures to promote the program, and WECC provided input to the design. One brochure is shared by Ohio and the Carolinas. WECC reported that the brochure and PowerPoint presentations are well received by the trade allies: "*The materials are great"*. The WECC trade ally reps have also trained the vendors to go to the Non Res Smart Saver website as the number one source of updated information. "*They know to go there and look for information*." WECC also promotes a "1-800" number to a call center that handles program questions.

Duke Energy also facilitated a series of trade ally roundtables in both Ohio and the Carolinas in order to obtain feedback about the Non Res Smart Saver program. The number one request made by the trade allies was to receive more help understanding how Duke Energy's rates are applied and how to calculate impacts and payback periods for the customers. In response to this feedback, Duke Energy is developing a series of webinars to train trade allies to be able to demonstrate the value proposition of energy efficiency measures in project proposals for the customers. The trade allies had been using an average rate to calculate payback, and the customers hold the trade allies responsible for any incorrect estimates.

RECOMMENDATION: Evaluate the usefulness of the training webinar. Consider recording the webinar for future web access, and develop guidelines for calculating impacts for different rates. The webinar may prove to be a benefit only if it is offered live, with a live question and answer period.

The trade allies for the Non Res Smart Saver program currently receive no incentives from participation "There is no incentive for the trade ally to help a customer fill out an application or pull up an invoice, pull a specification sheet and submit an application." In many cases, the trade ally representatives must spend a significant amount of time helping customers with application paperwork. They are motivated to participate when the proposal represents a large job and the sales contract relies upon the Smart Saver incentive being factored into the proposal. The trade ally representatives try to convey to the TAs that the more projects they are involved with, the higher chance they will have for up-selling customers to higher premium energy efficient equipment. Duke Energy believes that once the vendors are educated, they do understand the value proposition that the Non Res Smart Saver incentives represent, particularly since energy efficiency products tend to have higher profit margins "*so it's win-win all the way around*".

So far, this is enough motivation to have driven the Non Res Smart Saver program's current level of success. However, the issue of trade ally incentives was frequently mentioned by WECC's trade ally representatives because they also serve the trade allies for the Residential Smart Saver program. The Res Smart Saver program is *"wildly exceeding application goals"* because the residential trade allies are given incentives for each application. This discrepancy does have implications for the Non Res Smart Saver program, and the issue of paying trade allies incentives will be discussed in detail later in the report.

Technical consultant team

Duke Energy uses a team of technical consultants including Morgan Marketing Partners that handles the DSMore analyses that provides incentive levels and estimates cost effectiveness, Architectural Energy Corporation that handles DOE2 modeling, and Franklin Energy, that does engineering calculations for non-weather sensitive measures.

Call Center
Duke Energy provides a 1-800 number for the Non Res Smart Saver program. The call center is operated by CustomerLink, a third party company. They answer general program questions while technical questions are directed to WECC.

Collaboration and Communications

Duke Energy and WECC collaborate well and communicate frequently about the program. Duke Energy, WECC, and CustomerLink formally hold weekly conference calls to discuss feedback from the customers, and informally have more frequent calls to address specific issues as they arise. "*We have very frequent communication, it's very open*" stated a WECC manager.

One issue that interviewees frequently raised is fact that WECC and Duke Energy have different performance objectives. WECC's objectives are determined by their contract with Duke Energy and in that contract, WECC is currently paid per application. Duke Energy, however, is compensated on the basis of kW and kWh saved and avoided costs. This has been acknowledged as a problem by both sides, particularly as Duke Energy wishes to achieve deeper energy savings with higher impact measures that require more of a sell to customers because of their greater expense. Duke and WECC have already started discussions about changing the contract so that WECC's performance objectives are aligned with those of Duke Energy, and they hope to resolve this issue soon.

Currently, when WECC identifies an issue that needs improvement, they believe that Duke Energy calls on a third party consultant, Franklin Energy, for strategic input before making a decision[2]. WECC implements turnkey energy efficiency programs for other utility clients and they are accustomed to providing advice on strategic planning and program design. WECC believes that they have the expertise to help with the Non Res Smart Saver, but the current contract prohibits them from doing so. The working relationship between Duke Energy and WECC is operating well, and both parties actively work to address any issues that affect the efficiency of the program's operations. However, WECC seems uncertain about how much ownership Duke Energy wants them to have over the work they do. One WECC trade ally rep mentioned that Duke Energy is very quick to point out that Duke Energy runs the program, and "t*here is very little mention of WECC when I go out with Duke*". The same trade ally said that it doesn't stop WECC from trying to provide value. "*I don't know how Duke values WECC. My thought has been, that the more you do, the more value you're getting to Duke…I'm always analyzing what we could be doing better*." There may be regulatory accountability reasons for needing to make clear that Duke Energy runs the program, but in front of customers, it would be very important to make clear that WECC is a trusted partner in this effort, particularly if WECC has responsibility for helping to provide estimates of energy savings.

[2] In actuality, Franklin Energy is part of a team of technical consultants and they do not provide advice on program strategy or communications strategy

RECOMMENDATION: Duke Energy should make sure that WECC's key role in implementation is acknowledged to the customers. Duke Energy's clear acknowledgement of WECC's expertise in this field would help assure prospective trade allies and customers that they would be working with experienced advisors who would be able to help them resolve any barriers they might come across

Communications to Program Participants

The Non Res Smart Saver program has two categories of participants: the vendors or "trade allies", and the end use customer. One WECC trade ally rep stated that the program was initially designed so that WECC talks to the vendors while Duke Energy talks to their customers. WECC trade ally reps have been told that talking directly to the customers is outside WECC's scope of work. Duke Energy has since relaxed the restriction keeping WECC from talking with customers, but WECC believes that they could be much stronger advocates for Duke Energy if WECC is formally allowed to work closely with both vendors and customers. WECC believes they have the expertise and interest in working more closely with Duke Energy on this program than they are currently asked to. Duke Energy in the past has been reticent about using WECC for customer visits. If a business relationship manager (BRM) is available, then that person accompanies the contractor on the call. WECC is only asked to accompany the contractor if the BRM is not available.

WECC also reported that they are sometimes in the right place at the right time to help, but are not able to do so because of contractual boundaries. For example, Duke Energy's business relationship managers have called on WECC to ask the trade ally representatives to speak directly to customers about the program. WECC thinks the program would be more effective if they were able to work directly with the customer. WECC suggested that there may be a gap that they can fill for Duke Energy: There is a large faction of customers that don't have assigned Business Relationship Managers from Duke Energy because they are too small. WECC suggested during these interviews that they could represent these smaller customers, making sure that the customer understands that they are working on behalf of Duke Energy, but at this point WECC is not sure whether Duke Energy is receptive to this idea. One trade ally rep said that there already was "*some kind of effort*" to reach that mass market group but he was not sure what those plans are. Because these customers are not large enough to have the choice of opting out of paying the energy efficiency rider, "*they're underrepresented, there's great potential there*".

Market Research

The Non Res Smart Saver has two types of participants, the vendors and the end use customers, and some market research is conducted on those two groups. WECC reported that they do not do any market research for this program; rather, they have to rely on Duke Energy to provide that information. In some cases, WECC trade ally representatives reported that "*Duke does not share all market research results*", or that results might have only been shared with WECC management and not with the trade ally reps. In particular, findings from market potential studies are considered proprietary.

Duke Energy incorporates the market potential and market research results into their program design considerations and WECC is informed of any necessary changes to program design. One WECC manager said that this impacts WECC directly because WECC's first year performance goals were based on the results from the market potential study. Without knowing the findings from the market potential study, WECC could only give blind agreement to the performance goals. WECC may even be able to provide a reality check on market activity estimates that arise from the market potential studies if they had access to the research findings.

RECOMMENDATION: Share market research data when other partner's need to set goals from that data. Confidentiality may be obtained by use of non-disclosure agreements between Duke Energy and WECC's key managers. Without access to this data, WECC cannot make an informed decision about whether their performance objectives are realistic. WECC may even be able to provide a reality check on market activity estimates that arise from the market potential studies, if they had access to the research findings. This would allow them to provide more value to Duke Energy.

Duke Energy does share with WECC the market research that would help trade ally recruitment and support, in particular feedback that can help WECC identify any misconceptions about the program, or inaccuracies in the use of the program. Duke Energy and WECC collaborate on the list of trade ally prospects. They use listings purchased from Dun & Bradstreet to identify large manufacturers and high volume producers. WECC's performance objectives are based on number of recruitments off that target list. Duke Energy also conducted the trade ally round tables mentioned earlier.

There is less research available on the end use customers. A Duke Energy manager reported that they currently do not have the ability to capture market segment data effectively, in terms of targeting marketing towards customer preferences; "*We don't have good* [segmentation] *data on customers*"

Marketing

WECC markets to the trade allies and vendors using a combination of brochures, website resources, cold calls, and speaking engagements. Market segmentation studies have not been conducted on the Duke Energy commercial and industrial customers, and the program currently does not formally use targeted messaging. Program staff expressed a need for this kind of research. One WECC trade ally rep mentioned that the lighting brochure that "*lists a million lighting technologies"* that is used for all trades, and suggests that brochures on lighting by specific industries would be more useful. The WECC trade allies also reported that their trade allies and vendors prefer that marketing be conducted through emails. It's difficult for vendors to find the time to travel long distances to attend meetings with the WECC trade ally representatives. Even when smaller local training workshops are held, WECC hears "*'you could have just emailed me that information, or held a webinar' …They're much more savvy with technology than we give them credit for*."

RECOMMENDATION: Explore the effectiveness of email and electronic campaigns and survey trade allies to determine the frequency with which they prefer to be contacted. Reports from the field suggest that trade allies may prefer the less-expensive email campaigns over mailed materials. This may allow the Non Res Smart Saver to have a broader reach at a lower cost.

Duke Energy markets to the end use customer by two different channels. Brochures are distributed at trade shows and designed to raise customer awareness of the program. Duke Energy reported that this is marginally effective. Duke Energy has email marketing campaigns that are also marginally effective. "*The most effective [channel] is really the trade ally network.*" WECC stated, "*The most valuable marketing tool* [we] *have is the trade allies and* [we] *know that*. [We] *put a lot of time and energy into* [our] *trade ally network*."

Duke Energy program manager agreed: "*In the end it comes to the effectiveness of the vendor network…this is where you're going to drive* [customer] *behavior*."

The trade allies also need to market to the end use customer. One of the findings from the focus groups in the Carolinas is that the TAs in the HVAC, chillers and lighting industries were looking for calculators and case studies on end users in different market segments, to help communicate potential savings to customers. Other customer segments that trade allies were interested in include manufacturers, hospitals, and community colleges. "*We do need case studies*" for the Carolinas.

RECOMMENDATION: Develop case studies on customers who have implemented energy efficiency projects using high-priority high-impact measures. Include customers from several of market segments. This would allow customers in different market segments to have examples to which they can relate, lowering the perceived risk and uncertainty for new participants.

Coordinated marketing by WECC and Duke

A WECC trade ally representatives suggested that there has been a disconnect in trying to draw distinctions between WECC's marketing efforts to vendors and Duke Energy's marketing efforts to the end use customer. He suggested that the market should be approached on both the trade ally front and the end use customer front. "*WECC can be doing all the right things with the trade allies but can talk until they're blue in the face if* [end use customers] *are unaware of the program or if they can't buy anything due to the economy*." He suggested that Duke Energy needs to build more demand and awareness for energy efficient products with their customers. This is an oft-mentioned suggestion from WECC trade allies, and demonstrates a need either for Duke Energy to market the program more visibly to the customers, or for Duke Energy to share the effectiveness of their marketing with WECC. It is ultimately up to Duke Energy to decide how much marketing to do, and whether this program is a "demand pull" program, a "supply push" program, or a combination of both. But if Duke intends this program to be driven largely by supply push, with a greater marketing effort by the trade allies than by Duke, the program would require a different strategy in order to achieve success. We realize that this program must be cost effective and that Duke Energy prices are low compared to the rest of the country. This low avoided cost limits program expenditures and limits what can be cost effectively accomplished. However there is a need for more effective marketing. Duke will need to determine the available additional funding margin that can be allocated to marketing, if any.

RECOMMENDATION: Duke Energy should make clear to WECC the objectives of Duke's end user marketing campaign and share progress towards those objectives. Marketing efforts would be more effective if both Duke Energy's "demand pull" and WECC's "supply push" efforts were better coordinated, for example so that the two kinds of campaigns are introduced at the same time to the marketplace.

A WECC program manager reported that in his experience, the greatest chance of an energy efficient project going through is when the costumer sees both WECC and the trade ally or utility at the table. "*Greater success when that happened, than when trade ally or utility were by themselves…Customer could look at all three of these independent groups* [working together], *the trade ally who performs the work, WECC who cuts the check, and the IOU representative who knows my business and load shape and can tell me how rates will be affected*."

There is some occasional effort to coordinate marketing right now, but it needs to be part of the program design and strategically coordinated. WECC suggested that if a particular measure, such as VFDs, is targeted as a high impact objective, then WECC's efforts should be emphasizing VFD distributors with customized seminars and training sessions. At the same time, Duke Energy should be launching a marketing effort to their customers explaining payback periods and typical costs, to build excitement and demand pull from the customers.

RECOMMENDATION: Develop a coordinated marketing campaign for one market segment, implement it as a pilot, and evaluate its effectiveness. A small pilot would allow Duke Energy to assess whether targeting marketing to one segment would be a more effective approach for future program efforts.

Applications

Every application for the Non Res Smart Saver incentive program must be accompanied by a copy of the invoice and the spec sheet. The applications are processed by WECC's data processing center in Madison, WI, where it undergoes a review for errors.
If an error is detected on an application, either the entire application is rejected or WECC contacts the trade allies to ask them to help resolve the error. An example of an error is a missing tax ID number or a missing specifications sheet for a measure. WECC is rejecting a lot of applications due to Duke Energy's stringent requirements. One WECC trade ally rep has heard that an application error could be something "as minor as they didn't check a box".

Site Verifications and Quality Control

One of WECC's responsibilities is to verify measure installations at customer sites. The verification rate was recently changed. Initially, WECC was required to verify a random 5% of installations under $10,000, all customer self-installations over $1,000, and 100% of anything over $10,000. However, so many projects fit those criteria that the trade ally reps were effectively inspecting 8-9% of installations. This prevented the trade ally reps from spending time on outreach to prospective trade allies. Discussions are currently under way to change those inspection rates.

After the inspections are conducted, WECC enters the verification data into a database. Duke Energy requires that the original documents be kept so after entering verification data into the database, the verification worksheet is sent to storage. Spreadsheets are kept in a paper file then destroyed after one year.

In a few cases, WECC found that measures listed on the applications had not been installed. In these cases, Duke Energy went back to the trade ally and recovered the incentive payment. Duke also put the vendors on notice for future exclusion. The impacts from those installations were adjusted to account for the uninstalled measures. The Ohio trade ally rep reported that if he finds that a measure is missing, he tries to inform the customer what should be installed, and he does not note a pass or fail at that point but returns in three weeks time to verify the installs at the site again.

The trade ally reps use their discretion to determine how to verify a site at which there are too many installations to verify individually. At a site with, for example, 5,000 CFL installations, one rep reported that he would visit the site unannounced and visit various wings of the building. Duke Energy also places an emphasize safety so verifications that would pose a physical risk to the trade alley reps are not performed. In cases where installations cannot be verified because they are in an inaccessible spot, the trade ally reps must rely upon the honesty of the trade ally.

Because the WECC trade ally reps are responsible for verification of the Residential Smart Saver installations as well as the Non Res Smart Saver program, the high volume of activity in the Residential program also takes up verification time so that that less time is available for the Non Res Smart Saver verifications.

Rebate Processing Operation

WECC reported that their rebate processing operation receives a lot of compliments for its speed and accuracy. Incentive checks are sent out in 2 weeks or less, and one trade ally rep reports "Customers love it when they get a check within 10 days." WECC is required to process the applications within 3 days and has been successful in meeting this very short turnaround time. This is a high performance turn-around rate.

Quality Control

Duke Energy is extremely concerned about data integrity in the application and check disbursement process, and requires a 100% accuracy level. In order to meet that requirement, WECC's quality assurance process goes through three iterations of quality control checks, then is checked by customer account, then is sent for another round of invoice-related checks by three more staff members.

Data entry staffs' performance is tracked and reviewed for both accuracy and speed of processing. Every error is recorded, and data entry staffs undergo a quarterly review about their productivity. Quality control checks are performed every other day. If the same types of errors come up, the managers try to determine whether it's a technology issue or a training issue and rectify the situation. A WECC program manager mentioned that this requirement for 100% accuracy is extremely expensive.

Typical errors may include incorrect information on the application, mistakes in data entry, or a problem with the data upload from WECC to Duke Energy. If an error is detected, a correction measure with a negative count must be entered into the database. This provides a separate entry for the adjustment so that the original data is kept intact. The WECC data processing manager reported that errors occur infrequently, approximately 1-2 times a month.

Once an application is processed, WECC must upload the payment amount and what measures were on the application. Duke Energy has asked that the updates be as "real time" as possible, so that the records would be updated as soon as a payment is made. This rapid update makes it possible for Duke Energy's Business Relationship Managers to provide up to date information to any customers who ask about their check status. This synchronization of databases is perhaps the only difficulty for the rebate processing operation, but they report that they are in the process of coming up with a solution.

Data uploads occasionally fail due to a lost connection or timeout error but in the past there was no way to determine how much data was transmitted prior to the upload failure. The old solution was to upload the entire set of data again, check for duplicates, and then create the correction measures if there were duplicates. This was a costly time consuming process when this occurred. WECC has worked with Duke Energy to develop unique ID codes for each upload that the data processing manager believes will solve this problem in the future.

The process of transferring customer data from Duke Energy to WECC is currently a cumbersome process but the data manager did not know if any improvements were possible. Customer data is transferred using two different websites. One website is used to search for a customer by name and address, and another website is used to obtain account information. Often the data needs to be "cleaned" so that records are correctly matched, and in some cases the Duke Energy business account managers need to be involved in order to match large business customers with their multiple accounts for different buildings. However, this has not affected WECC's ability to process rebate checks to the customer in a timely manner.

During the early phases of the program, tweaks were needed to make sure that all the data needed for reporting requirements were being stored, and to make sure that data could be pulled in compliance with all the timeframes Duke Energy needed. Currently, other than the two issues mentioned earlier, the continuing need to improve near-real-time updates to Duke Energy's database and the difficulty in getting customer data from Duke, the application processing software is working successfully and rebates are being paid on time.

This level of service comes at a cost. One WECC program manager suggested that if the 3 day requirement to process incentive applications were lengthened, there would likely be a significant reduction in administrative costs. Currently, WECC needs to maintain staffing levels large enough to handle applications as if there were a spike in application volume. "*We don't have other clients for which we maintain this level of service.*"

Technology Selection

The Non Res Smart Saver program offers numerous technologies across five core technologies: 1) lighting, 2) HVAC, 3) motors, 4) food service, and 5) process-related equipment. Duke Energy's program manager reported that this covers about 80-90% of the activity in the marketplace. The process for selecting new technologies for the prescriptive Non Res Smart Saver occurs once or twice a year. New measures are usually added one of two ways. The first way is if the measure is appearing frequently in the applications for the custom Non Res Smart Saver program. The decision to roll a measure over to the prescriptive program is largely a judgment call by the Duke Energy program management. The second way is through the annual review of portfolio, conducted with the expert input of a third party technical consultant (Morgan Marketing Partners, who also generates the inputs for DSMore to determine cost effectiveness). Newly selected technologies are assimilated into the program throughout the year. Duke Energy has a lot of new technology on their radar and are thinking of doing pilots on new technologies to see how well the market accepts them.

Duke Energy explained that another factor affecting the selection of new technologies is the differing regulations regarding whether and when new technologies can be introduced. Ohio has more flexibility and will allow changes to the portfolio and to measures. Ohio is comfortable with the decisions in these areas. North Carolina, on the other hand, has very strict rules and is more restrictive in the kinds of changes that are permissible. This makes it difficult to adapt the program to reflect changes in the market.

This technology selection process is not well understood by WECC. Across the interviews, most trade ally reps have reported their various beliefs that Franklin Energy selects the technologies, tests the technologies, designs the program, and sets the incentive levels[3]. They also seem to believe that there is no process for moving custom measures over to the prescriptive program. All of these beliefs are incorrect, and suggests that Duke Energy should be more transparent about their technology selection process with their program implementer.

[3] Franklin Energy is a subcontractor that performs engineering calculations for non-weather sensitive measures. The prime contractor for the technical consulting team is Morgan Marketing Partners.

RECOMMENDATION: Duke Energy should share their technology selection process with WECC. This would allow WECC to better provide feedback to Duke about what information Duke's technical consultants need in order to make accurate estimates of market activity. This would also allow them to explain, if the trade allies ask, why certain technologies are not yet included.

The WECC trade ally representatives receive direct feedback from the vendors and trade allies about technology opportunities. One frequent suggestion from the trade allies is that common delamping measures should be added to the prescriptive Smart Saver program. "*We hear a lot from our trades, it's a common measure that's missing*." WECC trade ally reps also mentioned air compressors, more prescriptive lighting, inductive lighting, more VFDs, prescriptive building controls measures...As one WECC trade ally rep said, "*I can sit here for an hour…there's lots of little stuff*."

While there are some recurring suggestions for technologies that should be added to the prescriptive program, most interviewees agreed that the Non Res Smart Saver currently offers a good mix of measures. As one WECC trade ally rep said, "*It is hard to imagine that a Duke Energy customer can't find some energy efficiency measure they can use*."

Incentives

Duke Energy reported that they determine incentive levels using feedback from trade allies, Duke's business relationship managers, and calculations from the technical consulting team.

The technical consultants calculate incentive levels using information gathered across a variety of sources. The technical consultant team looks at what kinds of incentives other utilities' programs are providing and try to determine if those programs have had traction with their incentive levels. They start out with an effort to have the rebate pay up to 50% of the incremental cost, and make adjustments using DSMore, a financial analysis tool for calculating impacts and cost effectiveness. The technical consultants also provide estimates of market activity and penetration at different incentive levels.

The measures that are recommended for inclusion in the prescriptive program are ones that have a standard application and ones for which there are established track records of energy savings. In cases where the energy savings show wide variability, conservative numbers are used in the model. Duke Energy's program managers make the final determination from a list that the consultants provide.

The technical consultant who was interviewed reported that they currently have very little direct interaction with WECC. He also reported that it would be useful to have WECC, as the implementer, review the projections of activity and energy savings to see whether they agree with the projections and levels of activity, and to answer the question, "*Can you deliver on it*?"

RECOMMENDATION: Share estimates of market activity with WECC and gather their feedback on whether they believe the projected market activity levels are realistic, based upon their experience in the field. This would allow WECC use their direct experience in the field to relay any coming customer purchasing trends that may not yet be reflected in historical data.

Feedback on incentives from the field

WECC shares a lot of feedback from trade allies about incentives that are not appropriate, and about technologies the trade allies think should be added or deleted. One rep for the Carolinas stated that "*HVAC incentives are not high enough to incentivize customers*". However, a rep for Ohio believed the current incentives are appropriate.

One WECC trade ally rep suggested that measures that do not meet the absolute energy efficiency threshold for inclusion in the prescriptive program might instead be assigned a partial incentive that is proportionate to its energy savings. For example, a smaller incentive could be given for high bay lighting measure that is 88.7% efficient instead of the required 90% efficient. "*You could make a tiered approach. Right now, prescriptive is all or nothing, and if it's nothing it goes into custom*." This may be a method of including more measures in the prescriptive program. The custom Non Res Smart Saver is not within the scope of this evaluation but many trade ally reps have mentioned that there are large barriers relating to the difficulty and length of the custom application approval process as well as uncertainty about the incentives. These barriers prevent customers from participating in the custom Smart Saver program. If the prescriptive program has more flexibility on the energy efficiency of the included measures, it may be able to capture those energy savings that are disappearing in the crack between the current prescriptive and custom programs.

RECOMMENDATION: Determine whether it is feasible to offer a tiered prescriptive program. . This would allow Duke Energy to capture energy savings from measures that do not quite meet current thresholds for prescriptive and would have to be processed through the custom program.

Barriers

Economic

Several reps mentioned the economic climate as being a major barrier to participation. One rep reported that while WECC was meeting their objectives, the poor economic conditions were having a noticeable effect. One rep mentioned that while some customers were able to afford $100,000 projects, they would decide only to implement a $70,000-80,000 project because of concerns about their economic future. Below, trade ally reps described in their own words the effects the poor economy is having on applications.

> *WECC is "working with vendors proposing [energy efficiency] projects based on good ROIs, and even good ROIs are being pushed off because [customers] are kind of afraid of what's going to happen with the economy and what they're going to do with their money."*

> *"Customers are looking for a less-than-2-yr payback period"*
>
> *"Customers are saying, 'We're never going to get this project forward without upper management seeing a one year or 1.5 year payback.' So we'll roll in lighting in with the HVAC project."*
>
> *Energy costs are very low in the Carolinas and a rep states, "Energy efficiency is not first and foremost in minds of folks".*
>
> *"I'm honestly surprised that we have as much participation as we do in light of the economy…Most would not do it in this economy if not for the rebates."*
>
> *"With lighting measures, you can phase it in with a maintenance program. You need to be in a budget for 5 yrs before a chiller gets approved."*

Duke Energy program manager suggested as one solution that customers could be made more aware of lifecycle costs. "*What I see here are [people] focusing on: Here is the incentive, here is the capital cost, but not bringing into account the lifecycle costs of the measure*."

RECOMMENDATION: explore marketing and outreach campaigns that focus on lifecycle costs. Evaluate the effectiveness of this messaging focus, taking into account any further changes in the economic climate. This may allow customers to look beyond consideration about a measure's capital cost and its incentive, and understand the energy savings that would be delivered over the measure's effective useful life.

Paperwork

Another barrier is the amount of paperwork required in the application. Trade allies reported that they are spending a lot of time on the application and in many cases it is they who are filling out the applications on behalf of the customers. One trade ally rep said it was not unusual to spend 20 hours on an application. He recently helped a customer with a prescriptive application that was "*one inch thick*". Another trade ally rep agreed that customers are being deterred by the amount of paperwork for the incentives, and also points that this results in lost incentive money. The application can be submitted up to 60 days after the measures are installed, but because there is no motivation to fill out the paperwork immediately sometimes dollars are left on the table. "*It relies on customers' motivation to get money back*". The rep stated that the customers need to remember that they're paying into the rider.

WECC spends a lot of time itemizing measures on invoices submitted with the applications. Itemizations need to be provided on specifications sheets with exact model numbers so the correct incentive can be paid, but the model numbers are not always on the invoices. WECC does use a template for itemized invoices, and one trade ally rep suggests that this template should be widely distributed. Currently, the invoice itemization template is only given to WECC, but it is not officially distributed and it is not on the Non Res Smart Saver website.

RECOMMENDATION: Make the template for itemizing invoices available online. This guidance would allow trade allies and customers to send in more accurate applications that would be rejected less frequently and could be processed more quickly and cost effectively, without WECC needing to contact applicants for missing information.

Duke Energy has stated that they would like to provide more online tools, and this is supported by several trade ally reps. Currently, applications can be downloaded from the Non Res Smart Saver website but they still need to be faxed in. If the online application is well-received, Duke should see three signs of success: 1) the application process has shifted to the customer and 2) the amount of time spent filling out the application is shorter, and 3) WECC spend less time shortening the amount of time processing the application.

RECOMMENDATION: Conduct usability studies and satisfaction surveys of online application process. This would allow Duke Energy to quantify any reduction in application speed and any increase in customer satisfaction with the application process.

Increasing Participation From End User Customers

One trade ally rep suggested that customers might achieve broader and deeper energy savings if they had more assistance ranking energy efficiency projects in terms of cost effectiveness. This rep mentioned Duke Energy's existing assessment program that provides a project assessment report tailored to a customer's facility, but explained that this program is only available for customers that use 500 kWh or greater. "*A lot of customers are not getting a whole lot of assistance in ranking energy efficient projects. It's customers who have a more comprehensive plan, almost a prescription, on how to go about their energy efficiency projects*" that achieve the deeper savings.

RECOMMENDATION: Implement and evaluate a pilot program to help <500 kWh customers to prioritize energy efficient projects. This may allow more Duke Energy customers to achieve greater savings by providing them with a more complete picture of their energy efficiency options.

Increasing Participation From Trade Allies

When asked how they might increase participation rates from trade allies, the WECC staff members almost unanimously mentioned the issue of paying incentives to the Non Res trade allies. As one rep said, "*I'm a big believer that compensation drives behavior*." As mentioned earlier, one reason for this fixation is the fact that incentives are given to the trade allies and vendors for the Residential program, and the same trade ally reps support both Res and Non Res vendors. One trade ally stated that the "*achievements of the Residential Smart Saver may be as high as 150% above goal*, and attributed that achievement to "*the incentives that were given to the trade allies*". He suggested that perhaps trade allies might be "*given incentives for higher impact Non Res* projects".

One WECC trade ally rep reported that there are vendors who do realize the value of the Non Res Smart Saver without needing additional incentive. These vendors complete applications as a value added service for their clients, and they have been successfully using the Non Res Smart Saver program to market their own services

Most other reps supported the idea of paying the trade allies. "*Trades would love to get paid. A lot of them will do a free lighting audit in order to get the project*." One suggestion made was that Duke Energy might compensate trade allies for performance, perhaps by giving them part of the available incentive.

There may be good reasons for considering an incentive. One WECC program manager pointed out trade allies spend an "exorbitant" amount of time filling out proposals. If it were cost effective, this program manager believes Duke Energy may be willing to allow trade allies to receive some of the incentive funds, even if it means less for the customers.

Another option is to consider non-financial incentives. Recent focus groups with trade allies provided feedback that other utilities in the area offer the trade allies different kinds of non-financial incentives. As an example, one utility ranks trade allies with CFL icons after their names. One trade ally rep suggested "*it doesn't have to be a financial incentive, it could be a lead generation incentive*".

One trade ally rep for the Carolinas acknowledged that Duke Energy's regulatory constraints prevent them from changing the program to pay trade allies, and that a change to the program would mean a long process of refiling the program. This rep suggested a "stepwise" approach where non-financial incentives could be given, such as listing them higher on a directory, or on the Non Res Smart Saver website, or acknowledging the particular trade allies that are driving projects. Objectives could also be tied to the non-financial incentives, so that Duke Energy give trade allies more leads or marketing resources if they reach 25 projects.

In response, Duke Energy reported that they have considered these options, but have not yet acted on these options because "*the program is running well as it is*" in terms of cost effectiveness. Duke Energy should decide upon an action sooner rather than later. The Residential program's high participation rates contrast sharply against the participation rates in the Non Res program. Whether warranted or not, WECC trade ally reps attribute this disparity to the fact that incentives are awarded in one program and not the other. As reported earlier, the different levels of program activity are negatively impacting the trade ally reps ability to devote enough time to outreach and verification activities.

RECOMMENDATION: Resolve the discrepancy in incentives provided to Res and Non Res trade allies with the goal of equalizing the workload division and trade ally benefits between the two programs. Trade ally reps must verify installations in both the Res and Non Res programs, and the high level of activity in the Res program takes time away from their verifications to the Non Res program and to the recruitment of Non Res trade allies. Any discrepancy in program activity that increases the disparity in program activity should be reviewed.

Increasing Participation from End Use Customers

When asked what might be done to increase participation from the end use customers, most of the WECC staff suggested more marketing to the customers. One rep said, "*I'd like to be able to prime the pump*" with more advertising such as public service announcements, billboards, radio and TV ads. Another rep agreed that Duke Energy should do more marketing: "*They're a large organization and should use everything at their disposal to get the word out"*.

One WECC program manager observed that most markets respond to a combination of supply push and demand pull. He believes there are more unrealized opportunities to increase demand pull for the Non Res Smart Saver program. He suggested that the program might target property management firms. He also suggested that the program could provide more outreach to large industrial customers on a one-to-one basis with an energy advisor relationship, which he acknowledged Duke Energy is already doing to some extent.

The WECC program manager suggested that the marketing efforts be supported by data from market segmentation studies. This would allow the program to identify barriers that might be different for each sector, as well as to target messaging by sector. WECC suggested that the program should develop logic models at the segment level in order to specify what strategies should be employed against the different barriers. Another WECC program manager agreed and suggested that the program needed to provide consistent messaging and communication out to the marketplace. WECC knows there is some targeted marketing going on at Duke but no one really knows how the Smart Saver brand ties into it.

RECOMMENDATION: Identify one high priority market and conduct a characterization study about that market. Identify that market's barriers to participation and develop a logic model that specifies a strategic approach toward overcoming those barriers. Evaluate the effectiveness of the approach at the end of the program cycle. This would allow Duke Energy to see if they would be able to successfully drive greater activity in a particular segment if there arose a need for doing so in the future.

Perceived Free Ridership

When asked about their perceptions of the level of free ridership, most trade ally reps said they believe it is very low because of poor economic conditions. These trade allies reported,

> *"In today's economy it's low…people are not spending money. The [desired] paybacks have changed dramatically from what companies were willing to invest before."*

> *"I think they're looking to the utility and trade allies to tell them how to cut their costs."*

"Not a problem until the economy recovers."

One trade ally rep believed that about 15% of the lighting retrofits would be done without the Smart Saver program. However, the trade allies try to leverage any lighting-related free ridership by bundling the lighting measures with high impact measures such as chillers, which has a "huge" incentive but also requires a great capital expenditure. The bundling of high impact measures with lighting measures allows the overall project to be cost effective for the customer. Accordingly, another trade rep suggested that free ridership could be decreased by doing the converse and focusing on higher impact end uses when targeting the trade allies.

Two of the trade ally reps raised an interesting issue with regards to free ridership and the Non Res Smart Saver program. One rep said, "*Many customers don't realize the impact of free ridership. They feel it's their money, they feel they're owed that incentive*." This concept of an incentive as an entitlement is something that another rep also spoke about. This other rep suggested that the concept of free ridership may not be applicable for the Non Res Smart Saver program because the companies are already paying a hefty energy efficiency rider. "*They have to use the program. They're paying for it and pretty heavily for it*." In that sense, the companies are *paid* riders, not free riders. In many cases, the large Commercial and Industrial customers are very aware they have paid into this program and they already pay close attention to the program. Other customers report that they only started considering the program when a vendor tells them that they are already paying into the program and they ought to look into it.

RECOMMENDATION: Program managers should consider whether companies that actively seek out incentives are free riders or *paid* riders. Free riders are generally considered something to be avoided, and many utilities spend large amounts of evaluation money trying to determine the level of free ridership in their program in order to adjust their program's energy savings to only report net new savings achieved from the use of public funds. A *paid* rider, however, may be a different issue. Paid riders should be the target market for a program that they are paying for that seeks to return value to those who paid into it. In this case, a high level of paid ridership might be considered an indicator of program success.

Perceived Spillover

One WECC trade ally rep reported that there may be up to 15% spillover, just based upon anecdotal evidence. In some cases, the spillover is unintentional, and occurs when a customer intends to apply for an incentive but "*missed the mark*" with regards to the application deadline. To increase spillover, a WECC program manager suggested that if end users can be educated about the benefits of energy efficiency, it can become a competitive issue. Spillover would increase because dealers offering energy efficient equipment would have a competitive edge over other dealers, which would encourage those other dealers to also offer energy efficient equipment. A WECC trade ally rep reported that there is definitely spillover to gas measures because vendors do not want to leave it out of an application. They know they're not getting incentives, but they can demonstrate savings for those gas upgrades for the customer.

Areas That Are Being Improved

Automation
A Duke Energy program manager believed that automating processes to capture program data would be the biggest improvement that the program needs. Currently, the program data is recorded across several different sources and must be integrated manually before it can be used to inform decision-making. Duke Energy is currently reviewing the information technology infrastructure of several of their energy efficiency programs with the goal of automation in mind. *"[We need to get] away from manual capture, [it's taking] people away from being able to think strategically when they are working on dumping data into a spreadsheet."*

Co-Branding
Duke is aware that the trade allies would like to co-brand with Duke Energy in order for them to get credibility with prospective customers. Duke Energy hopes to have a co-branding arrangement worked out by the end of the year.

New Service Contract
At the time of the evaluation, Duke Energy and WECC were discussing changes to the existing service contract, in order to align WECC's program objectives with Duke's. As part of this alignment, both sides agreed that in order to achieve higher impacts by focusing on large commercial and industrial customers and by pushing high impact technologies such as chillers and VFDs. At this time the new contract has not been negotiated, but as a good faith gesture, WECC has already adopted this new focus on larger customers and higher impact measures. Accordingly, WECC will now only respond reactively to trade allies' requests for information as opposed to the previous approach of actively seeking out opportunities to provide information. They will also only provide support to the Residential program trade allies and vendors only when they are asked to. This new direction was initiated in mid-summer of 2010, but both Duke Energy and WECC expect to see these efforts start paying off over the course of the next program year.

Trade Ally Interview Results

The two Smart Saver trade allies from North Carolina and three trade allies from South Carolina were interviewed in March 2010. All of the interviews were conducted with a sales manager within the firm or an equivalent representative. Each of the respondents indicated that they are the individual within their company who has the most experience and is the most acquainted with the program. The interview protocol used during these interviews can be found in Appendix A: Vendor Interview Instrument.

The interviews were written to cover various aspects of the program, such as program operations, aspects of trade allies' involvement, incentive levels applied, covered technologies, and program effects from the trade allies' perspectives. The results of the process interviews are reported by the response categories presented below.

Program Materials

We asked the trade allies if they had enough program materials such as brochures, applications, and program documentation to effectively sell the program to their customers. All five trade allies indicated that they had enough program forms and applications for their short-term use, but thought that Duke Energy needed to provide more marketing materials to support and strengthen their individual marketing and outreach effectiveness to end customers. Both of the trade allies in North Carolina and one in South Carolina said that they had never received any marketing material support from Duke Energy for the Smart Saver program.

Problems That Have Come Up

All trade allies interviewed said that their experiences with the program were free of any problems and that they were pleased with the program.

When we asked about customer complaints from the trade allies' perspective; in response to our question, trade allies reported that there have been very few customer complaints. The only customer complaints that have come up had to do with customers experiencing actual savings that was assessed to be slightly less than the estimated savings of the measure.

Two trade allies in South Carolina mentioned that since they use a table to calculate estimated savings, the actual savings for a measure can vary from customer to customer, but they both considered this a challenge that had more to do with understanding how Duke Energy charges for service than the Smart Saver program technologies themselves. They also noted that already low overall energy bills made the savings from the measures sometimes appear to be less for certain customers whose energy bills are relatively low compared to the savings projections for customers with higher electric costs.

Wait Time for Incentive

The length of time that passes from when the application forms are submitted, to the arrival of the rebate check are described as reasonable by all five trade allies. The stated average length of time to wait for a rebate check varied very little from 2 to 3 weeks. While this evaluation did not confirm the wait times by reviewing the application dates and the date of the rebate distributions, past experience in these types of studies indicate that contractors and customers expect rebates to be promptly processed and paid. A 2 to 3 week period is not only reasonable, it is faster than other programs offered by other utilities we have evaluated in the past which have taken in excess of 4 to 6 weeks.

What About Smart Saver Works Well

Each interviewed trade ally was asked what they think works well about the program. This question was then followed with a question about what changes should be made to the progam. The trade allies responded to the question of what works well about the program with a variety of responses. Three out of five trade allies mentioned ease of use and ease of forms as an aspect of Smart Saver that works well. Further, two trade allies noted that the ease of forms allowed them to offer to fill out the forms for their customers and provide this service at no additional charge to their customers. Complex forms or rebate process whould require them to recover some of that cost via their pricing arrangments. Specific responses include:

- “It’s easy to get done quickly. There’s just enough paperwork to be thorough, but not too much to be a burden.”
- “The rebate checks get to the customers very quickly.”
- “WECC has been there for us whenever we’ve had a question, and they’ve been pleasant to deal with.”

All trade allies interviewed see the program as a way to encourage customers to upgrade their lighting equipment to a higher efficiency level. In addition, these trade allies noted that the current rebates do provide an incentive for their customers to buy the more efficient product.

What Should Change About Smart Saver

The responses to the question of what should be changed varied among the trade allies, with some vendors providing multiple responses. One of the common responses received is that trade allies would like to see a higher incentive payment to help their customers achieve a faster return on investment and increase the trade allies’ sales rates for high efficiency products. Two trade allies mentioned the added value in pushing energy efficient products via a trade ally incentive as a way to achieve higher levels of energy savings. One trade ally thought a monetary incentive would work best, but another felt either a monetary or an incentive that increased awareness, such as a preferred vendor group, would be beneficial as well. Trade allies also want to submit online applications, although it was noted that the form process currently works well. Other comments received include:

- We'd like to see the energy efficiency levels be a little less stringent. It's tough to go from prescriptive to custom (or a whole new product) on the basis of less than a percentage point in difference.
- We focus directly on lighting. Sometimes I just think we get too much information about other measures.

Communications with Duke Energy Staff

All of the trade allies interviewed said that communication with Duke Energy staff was fine, though limited. No communication issues were identified by the interviewed allies.

Customer Awareness of Smart Saver

Trade allies were asked how they made customers aware of the Smart Saver program and then to describe the customers' initial reaction to the program.

All of the trade allies said they tell their customers about the program during normal sales communications and present it as a way to achieve a faster return on investment for the incented high efficiency technology. All trade allies said that customers respond positively to the idea of the incentive and the savings.

Both of the North Carolina trade allies and one of the trade allies in South Carolina said that the vast majority of their customers were not aware of the Smart Saver program before it was presented to them (by the trade ally). Furthermore, all three trade allies said that their customers often do not initially believe that the rebates are real and need to be convinced of the rebate and estimated ROI (Return On Investment) either by visiting the Duke Energy Web site or talking to a Duke Energy representative. All three trade allies felt that his customers' skepticism over savings was a result of difficulty in understanding the Duke Energy billing system. These comments indicate that program brochures and informational materials may be helpful in convincing customers that the offer is legitimate and it can help convince customer to take advantage of the offer. TecMarket Works agrees that program brochures which support the market efforts can and typically do improve the penetration and sales rates and help trade allies move their high efficiency products.

Market Transformation

Trade allies were asked what the incentive level would have to be for more than 80 percent of the market to elect to up-grade to the energy efficient model. One trade ally responded that because of the current economic conditions most customers were looking for a maximum of an 18-month return on investment and a six-month ROI would achieve 80 percent of the market going to the more efficient unit. The most specific reply from a trade ally was that an incentive at 80 percent of the material cost of the equipment would achieve this goal. These comments suggest that the market has tightened as a result of the economic slow-down and that it may be getting harder to move customers to the up-graded choice. This also argues for building supportive materials for the allies to help "up-sell" to the energy efficiency choice. It also suggests that the importance of the incentive and its impact on speed of the investment recovery is taking a higher place of importance in the decision framework. In these conditions we would expect to see a decrease in the number of freeriders as customer move toward the lower cost options as a result of increased economic pressures to minimize first costs. This condition also opens an opportunity for the allies to be more effective in helping the customers who can up-grade to the energy efficient choice, if the return can be clearly demonstrated to the customer and if the incentives are set at a point to be both cost effective and act as an effective change inducement.

Why Trade Allies Participate

Why trade allies participate varies from the basics (increased sales/profit) to the altruistic (doing the right thing for their customers).

- "In this economic climate it's often nothing or something instead of "how much". The program helps us get to "something."
- "You can't beat offering someone a discount."
- "When you can actually save a client money on the front end and the back end, that builds great trust."

Program Technologies and Incentives

We also talked to the trade allies about the technologies offered in the program, and the incentives that are provided. The technologies covered are supported by everyone we spoke with.

Technologies and Equipment Covered

All five trade allies interviewed thought that no technologies currently covered by the program should be removed.

Incentive Levels

All trade allies interviewed indicated that they were less than satisfied with the current incentive levels. One trade ally noted that in a down economy a higher rebate level is much more important than it is in a strong economy since the window for a return on investment is smaller. Another trade ally noted that it is often an all-or-nothing proposition for projects, so the incentive is inducing a tipping point rather than just increasing normal participation.

Other Technologies That Should Be Included

Trade allies mentioned six technologies that they thought should be considered for the program. The most often mentioned technologies were LED and induction lighting. Two trade allies also expressed a desire to see non-peak technologies such as parking lot lights covered. Other suggestions included:

- "Plain old de-lamping with reflectors."

- "There are some new compressor controllers that can give about 15 percent savings."

- "KVAR[4] units, compressor controllers. That should be the next focus."

How the Program Changes Business

Overall, the trade allies report that the program has changed their business by increasing their sales, increasing the size of their customer base, and providing high levels of customer satisfaction. The comments received from the interviewed contractors include:

- "It's helped us through a tough economic time. That's for sure. Without it we would have changed negatively."

- "It's good to be on the forefront of a changing marketplace. This allows us to get more knowledgeable on the technologies that are proven, and see that they work for ourselves."

- "We are able to better marry our customers' short and long-term savings goals."

Suggestions for Streamlining Participation Process

The only suggestion offered by the trade allies was to streamline the process came from contractors who suggested that the program applications be available via an online process and allow for online status checks of applications. All five trade allies said that this would improve their participation experience.

Program Results

We asked the trade allies about the benefits of their participation in the program to them and to their customers, and how the program has altered their business by changing what equipment they offer. None of the contractors have made significant changes to their marketing or stocking strategies because of the program. Their goal is to obtain the best return on investment for their customers. The incentives mean that they can push the energy efficient units at a reduced price allowing more customers to obtain a faster return on investment. These findings are consistent with the program theory to increase market penetration via rebates and incentives.

Smart Saver's Influence to Carry Other Energy Efficient Options

Three of the five trade allies said that the program has resulted in their businesses carrying other energy efficient equipment not covered by the program. Two trade allies now carry solar devices, two carry LEDs, and one carries power factor correction devices. We note that the addition of additional product lines is a metric associated with market transformation impacts above and beyond direct program impacts. That is, the program's effect has been to increase the market availability of other energy efficient products carried by these allies.

[4] http://www.kvar.com/1000/home

Program's Effect On Manufacturing Practices

Two of the five trade allies thought that the program has increased the numbers of energy efficient technologies being manufactured (an indication of possible market effects above and beyond the program). Furthermore, one trade ally said that less efficient products are being pushed out of the available technology market because of the specifications required for the rebates. Three trade allies were unsure of the program's effect on manufacturing. These responses provide an indication of possible market effect savings that can occur as programs influence the operations of a technology market.

Program's Influence on Business Practices

We asked the contractors if their business would change if the Smart Saver program were no longer offered. We posed the question: *"If the program were to be discontinued, what would happen to the volume of sales of the high efficiency models?"* All five trade allies indicated that sales would decline "on the edge" [lower sales volumes] to "dramatically" decline [significantly lower sales volumes]. This response indicates that these allies think that a substantial part of their company's total sales are program induced, suggesting low freerider levels. Specific responses include:

- "Right now it's all or nothing, so we'd have a lot more nothing."
- "It would cut sales for sure."
- "We'd certainly focus on different products, and not try to sell program measures as hard."
- "I think we'd have a pretty heavy revenue gap [for our business] if that happened."

None of the trade allies said they would change their high efficiency model pricing structure if the program were no longer available, suggesting that the program has not had an impact on product pricing. This also indicates that the customers are getting the full advantage of the rebates because the allies are not up-pricing.

We also asked the contractors what percent of their total measure sales were high efficiency and what percent were rebated through the Duke Energy program. Only two trade allies were able to provide percentages. Both trade allies reported 100 percent high efficiency units are being pushed and sold, and 100 percent of their customers are receiving the Duke Energy rebates.

Continuing Need For The Program

We asked the trade allies if they thought that the program was still needed. All of the interviewed trade allies said yes the program should continue. All trade allies considered the Smart Saver program an essential sales tool for energy efficient equipment and indicated that sales of energy efficiency models would fall to dramatically fall.

Freeriders

We also asked the trade allies to estimate the level of freeriders. Only two trade allies felt qualified to answer questions about their customers' level of freeridership. The other trade allies felt that since many projects were based on return on investment and life-cycle, it would be hard to quantify freeridership. That is, those trade allies use the incentives to fit the customers' ROI requirements and the overall ROI is what decides whether the project goes forward. Since the trade allies don't offer an either/or scenario and also handle much of the paperwork, many customers may not be aware of the role that the incentive plays in their decision. One trade ally also mentioned that once the rider is explained to them, some customers' feel they are recouping the incentive.

One trade ally did report that the rebate makes a great difference to 50 percent of their customers and at least somewhat of a difference to 25 percent. Another trade ally stated that the rebate makes a great difference to 30 percent, somewhat of a difference to 60 percent and little or no difference to 10 percent of customers. These estimates, while not reliable indicate that the trade allies think freeridership would be in the 15% to 40% range.

Participant Survey Results

We interviewed 20 (10 in North Carolina and 10 in South Carolina) out of a possible 73 Smart Saver participants for which we were provided contact data and measure description. Five participants were surveyed on two different energy efficient measures.

Overall Satisfaction

Participants were asked about their overall satisfaction on a one-to-ten scale with one indicating they were completely unsatisfied and ten indicating that they were completely satisfied with the Smart Saver program. We also asked about their satisfaction with Program Understandability, Duke Energy Staff, Rebate Levels, Rebate Time, Technologies Covered, and Information Materials. As shown in Figure 1 participants have a high satisfaction rate with the Smart Saver Program. Only three categories received any ratings from customers less than 7: Technologies Covered, Rebate Levels, and Communication with Duke Energy Staff. Those participants noted that the rebate levels could be higher. Two customers indicated that Duke Energy was often unclear when requesting more information for applications. However, these customers also indicated that they were referring to custom applications rather than the prescriptive applications covered in this report.

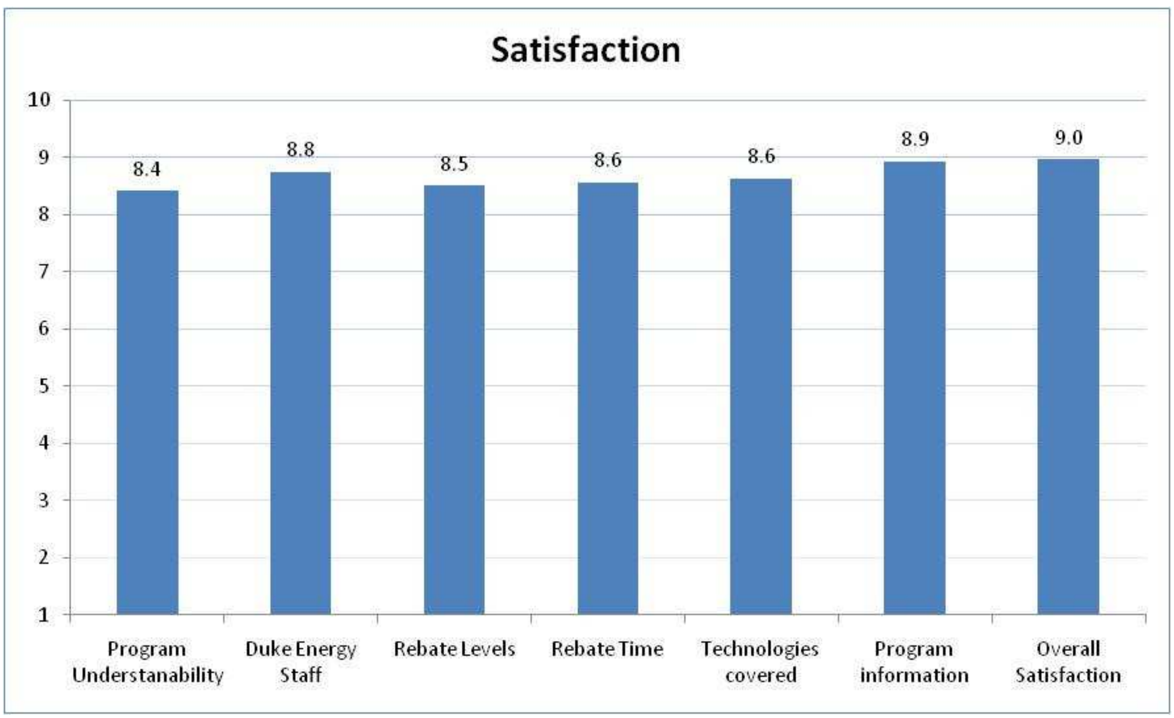

Figure 1. Overall Satisfaction with Non-Residential Smart Saver Prescriptive

Motivating Factors

Participants were asked an unprompted question for to identify all the factors that motivated them to purchase the energy saving device. Figure 2 shows the factors mentioned as well as the percentage of participants surveyed who mentioned each factor. Ninety-one percent (91%) of participants cited a desire to reduce energy costs as a motivating factor with the program incentive being the next highest cited factor at 50%. Together, these indicate that the desire to save energy/money, linked to the incentive to lower the procurement price barrier is an effective combination. Three of the reasons given under the "other" category were "a corporate directive regarding energy efficiency" and one reason expressed as "because of a federal grant" we received.

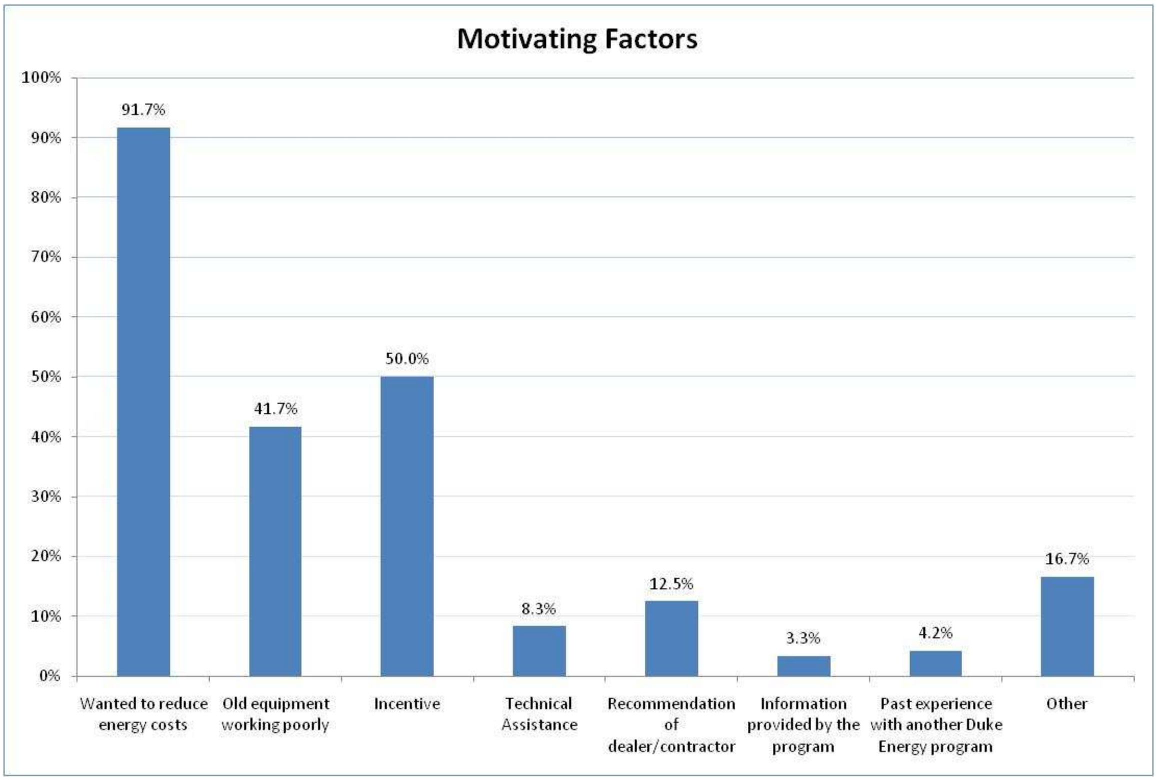

Figure 2. Factors that motivated participants to purchase an energy saving device

Technology Being Replaced

Five (25%) of the surveyed participants indicated that the measures installed replaced a similar energy efficient measure. Four of these participants indicated that the measure being replaced was 5 to 9 years old, and one indicated the measure being replaced was less than five years old.

Two participants (10%) indicated that this was their first purchase of the particular energy efficient measure that they installed and had rebated through the Smart Saver program.

Incentive Forms

Fourteen of the 20 participants (70%) surveyed said that they personally filled out the incentive forms. Of those 14, 13 (93%) said that they had no problems in understanding or completing the forms. One participant indicated that the forms had to be re-submitted and the follow-up with a Duke Energy Representative was satisfactory.

Wait Time for Incentive

The length of time that passes from when the application forms are submitted, to the arrival of the rebate check are described as reasonable and free of problems by all 20 participants.

What About Smart Saver Works Well

Each participant was asked what they think works well about the program. Three participants (15%) cited the incentive as what they liked the most. Two participants (10 %) also cited the simplicity and understandibiltiy of the program.

Increasing Participation

Participants were asked what they thought would increase participation in Smart Saver. Five participants thought that awareness for the program was very low and that Duke Energy should advertise the program more aggressively. Two customers mentioned never having heard of the program until the trade ally brought it to their direct attention. One participant recommended making technologies that are currently only available in custom options, such as LEDs, available for the prescriptive program.

What Should Change About Smart Saver

Five participants (25%) offered examples of what they thought could be changed in the program:

- "Ask us what our needs are instead of telling us what's covered."
- "Filling out the paperwork, but I didn't find it unreasonable."
- "Not enough customers know about it."
- "Higher rebate levels."
- "I'd like to check the status of my rebate."

Non-Residential Smart Saver Net to Gross Analysis

In order to estimate the net savings attributed to the program several questions were added to the participant questionnaire. These questions were asked to determine the extent to which the program's information and incentives caused the program-covered and spillover actions to be taken by the participants. To conduct the freeridership analysis we used the responses from three questions to estimate the net-of-freeriders level of savings for the program-rebated installation. We also used the results from two questions to estimate the amount of spillover savings. The questions were presented to the participants using a statement format in which the respondent could agree or disagree at various levels. Respondents were asked to provide their response using a 1 to 10 scale where a 1 meant that they strongly disagreed with the statement and a 10 indicated that they strongly agreed.

Freeridership Analysis
The three questions used to estimate the net to gross ratio included the following:

Net to Gross Questions

1. The rebate from the Duke Energy Smart Saver Program was a critical factor in my decision to purchase the high efficiency/energy efficient product.

2. I would have bought the same make and model of the < *incented item*> within one year of when I did, even without the rebate from the Duke Energy Smart Saver Program.

3. The rebate from the Duke Energy Smart Saver Program was not necessary to cause me to purchase the higher efficiency product when your company bought the new <*incented item*>.

Responses

Strongly Disagree									Strongly Agree
1	2	3	4	5	6	7	8	9	10

We reverse the direction of the score for two of the above questions to help eliminate bias in the response scores.

Because the scale was built to reflect a 1 to 10 score, the scores from the responses were used as direct calculation metrics for estimating the NTG inputs to a distribution approach to set the freeridership score. That is, if they responded with a score of an 8, then 8 points were added to a NTG point tally for that individual. If they responded with a 2, then 2 points were added to their tally. However, because for two questions a low response score meant a high freerider score, and in the other a low score response meant a low freerider score, the scores had to be adjusted to be comparable as a group. This meant that for two of the scores, the score provided had to be subtracted from 10 to be comparable with the other question responses. This allowed all scores to be added in a way that a 100% non-freerider score would add to 30 (10+10+10) and a 100% freerider score would add to 3 (1+1+1). We then applied a linier distribution to the range of scores with the end values tied to either a 100% freerider or a 100% non-freerider, both of which we had in the respondent population. This approach eliminated any evaluator bias associated with the assignment of a NTG score for any participant because that value was numerically assigned as a linier function of their distribution between a 100% freerider and a 100% non-freerider. That is, the scores were normalized to their relationship between these two extremes. A respondent that was numerically half way between the two extremes (regardless of their point score) was mathematically assigned a NTG score of .5.

The results of this analysis provided a program average NTG ratio of .63, meaning that 63% of the achieved savings are non-freerider savings and fully countable as a program's net effect. This placed the freerider score at .37, meaning approximately 1 out of every 3 participants received the rebate for an action that they would have taken without the program.

Spillover Analysis – Short Term

Two questions were added to the survey to estimate the level of short and longer term spillover. Short term spillover is defined as actions taken by participants above and beyond those rebated by the program, but for which the program was a driving influence for the participant taking that action. The questions asked include:

1. Since you participated in the Smart Saver Program, have you purchased and installed any other type of high efficiency equipment or made energy efficiency improvements at your company or at any other locations? *<Y/N>*

2. My experience with the Smart Saver Program in <2008, 2009> influenced my decision to install different types of high efficiency equipment on my own. (agree or disagree – see point scale)

Responses									
Strongly Disagree									Strongly Agree
1	2	3	4	5	6	7	8	9	10

If the respondent indicated that they have not purchased or installed any other type of high efficiency equipment since their participation in the program, the spillover level was set to zero and no spillover credit was provided. If they responded that they had purchased energy efficient equipment, they were asked about the type of equipment and where it was installed. However, no spillover points were provided to these respondents that took additional actions unless they also indicated that their experience with the program caused, to some degree, that action to be taken by scoring some level of agreement with the agree or disagree question. If they indicated that the program was influential in their purchase and use decision, then their freerider score was adjusted by the fractional amount of the strength of the influence value they provided in their response to the agree / disagree question. That is, if the respondent indicated that they had purchased additional energy efficient items and also indicated that the program was influential in that purchase at a score of 7 (level of agreement or disagreement) then their NTG score (for that individual) was multiplied by .7 to estimate the short term spillover effects for that installation.

This approach provided an addition spillover score that was equal to their NTG score, but reduced by the fraction of the level of agreement that the program caused that spillover action to be taken. Thus, if they were a 50% freerider (see freerider analysis above) and they scored a 7 on their agree / disagree score that the program was to some degree influential in causing their spillover purchase, then the spillover score for that individual participant was .35 (.5*7=.35). In this case .35 is provided as a short term spillover score for that participant for that action taken. The short term spillover scores were then summed and averaged over all participants, including those that took no additional action (and received a 0.0 spillover score), to arrive at an estimated short term spillover score. The result of this analysis is that the short term spillover score equals .11 over the entire population, indicated that the program increased savings by driving at least some customers to take additional actions that were influenced by their participation in the program. While this added savings is small and suggests that perhaps an additional 11% savings is being achieved by the participants in the program, we caution on this interpretation. The assignments of spillover is subjective and depends on the ability of the agree/disagree score to actually estimate the degree of causation. While we are sure that the program was influential in helping to acquire the added savings, this analysis is not definitive. For this reason, we project that short term spillover credit be set at 10% as an estimate for short term spillover.

Spillover Analysis – Longer Term

Our analysis also indicates that there is an additional impact on longer term spillover levels, but that level may be small. The short term spillover analysis only provided spillover credit to those that indicated the program was at least to some degree influential in their decision to take additional action, and who also had already taken additional actions. For the longer term spillover analysis we used the score of the program's influence on their decision to purchase additional energy efficiency items, even if they have not yet made a purchase. That is, we used their score for the agree/disagree spillover question above on the program's influence to install energy efficient items, even if they have not yet made an additional purchase. The scores received ranged from a 9 - indicating that for some the program has had a strong effect on their future purchase decisions - and a 1 meaning that the program had no effect. The average score across all surveyed participants is 2.4, indicating that there is some influence, but for the most part, that influence is small. Because of the low score we do not provide an estimate of longer term spillover, but note that there appears to be some level of influence. However, at this time and using this approach, the results are not strong enough to provide an estimate.

Net to Gross Score

For this program, using the approach discussed above, we estimate that the final net to gross score is approximately 0.73 including a freeridership NTG of 0.63 and a short-term spillover NTG of 0.10. However, because of the small sample size used to drive this analysis (N=26), we expect the NTG ratio for this program should fall at a point greater than 0.60 but less than a 0.75. As a result, we suggest using the NTG ratio of 0.70 for the program as a whole until more definitive research can be conducted.

Impact Analysis

The impact evaluation employed a tracking system review, an engineering review of the lighting measure savings calculations, and field measurement and verification (M&V) of selected lighting measures. The tracking system review revealed that a few measures were responsible for the majority of the savings. Tracking data for North Carolina obtained from Duke Energy from Nov, 2008 through April, 2010 show the following breakdown of energy savings by measure:

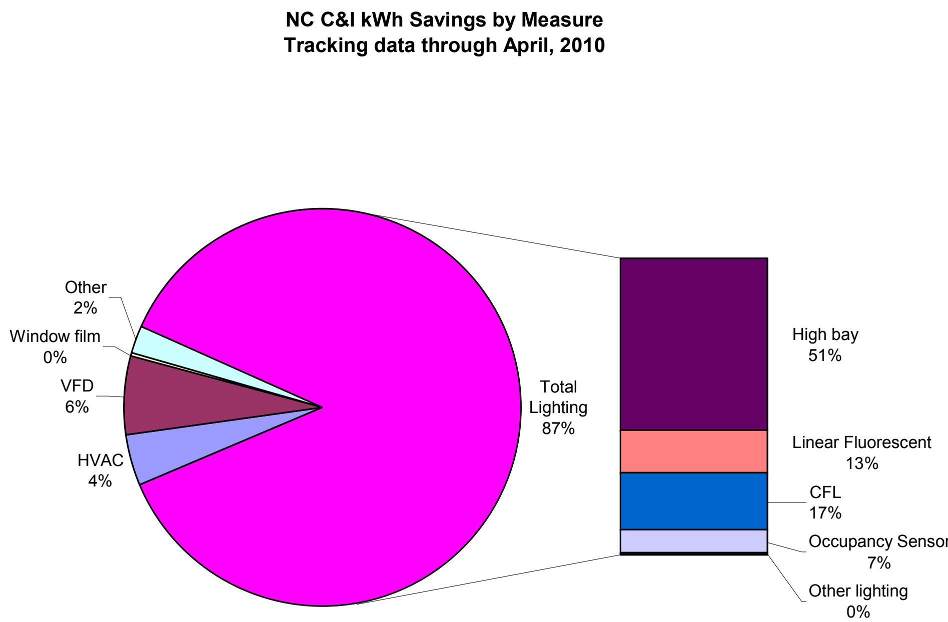

Figure 3. Measure Contribution to NC C&I Program Savings.

Note, lighting measures made up 87% of the total reported savings. Lighting was dominated by high-bay applications, making up 59% of the total lighting savings, and 51% of the total program savings.

Tracking data for South Carolina obtained from Duke Energy from Nov, 2008 through April, 2010 show the following breakdown of energy savings by measure:

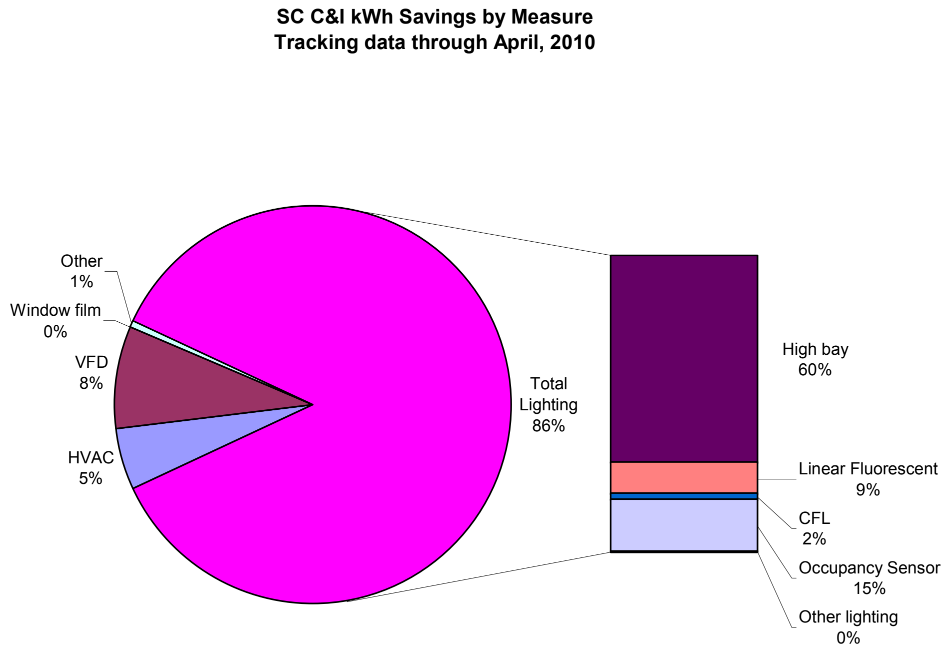

Figure 4. Measure Contribution to SC C&I Program Savings.

Note, lighting measures made up 86% of the total reported savings. Lighting was dominated by high-bay applications, making up 70% of the total lighting savings, and 60% of the total program savings. Based on this analysis, the impact evaluation was conducted as follows:

Lighting measures. We focused on the high bay applications, since these made up 60% to 70% of the total lighting savings[5]. Engineering review of the lighting savings involved a comparison of the measure savings recorded in the program tracking database to the savings estimates used in program design. This comparison revealed a problem with the tracking system savings estimates. The savings for each measure were recalculated using the fixture kWh and kW savings estimates developed during program planning and entered into DSMore; and measure counts as recorded in the tracking system

The evaluation team conducted field M&V on a sample of high bay lighting participants to estimate savings for this measure. The field M&V consisted of a site visit, verification of the quantity and type of incented lighting fixtures, verification of fixture wattage assumptions against manufacturer's catalog data, interviews with customers to identify the type and quantity of the replaced fixtures, and short-term monitoring of lighting system operation using light loggers to verify operating hours. The field M&V activities

[5] Note, an initial tracking system analysis based on tracking system energy savings showed high bay fixtures comprised a much larger fraction of the total lighting savings. During a more detailed review, the tracking system energy savings were found to be in error. Program planning estimates were substituted for the tracking system estimates, resulting in the measure breakdown shown in Figure 4.

were conducted by Duke Energy contractors and the results were forwarded to Architectural Energy Corporation for analysis. The field M&V activities were compliant with the International Performance Measurement and Verification Protocols (IPMVP) Option A – Partially measured, retrofit isolation protocol.

A sample frame of high bay lighting participants was developed by TecMarket Works and a random sample of 35 sites was selected across both states. Each site was recruited for the M&V study by the Duke Energy M&V contractors. The contractors were successful in recruiting and installing instrumentation at all 35 sites.

Lighting Analysis

Lighting program participation records covering the period from November, 2008 through the end of April, 2010 were obtained from Duke Energy. The data, delivered as an Access database, contained customer name and address, installing vendor contact information, measure descriptions, unit energy savings estimates, number of measures installed, lighting operating hours, installed fixture watts, rebate amounts, and so on. These data were examined to identify which of the measures promoted by the program were adopted by program participants and in what numbers, how the energy savings in the tracking system compared to the program savings estimates, and the availability of any customer description data that could be used in the analysis.

The lighting program tracking system showed lighting measures installed in sites representing a total of 360 participating customers. The types and quantity of measures installed are shown in Table 1 and Table 3.

Table 1. Lighting Measures Installed Under NC Program

Measure Group	Count	kWh	kW
CFL	42,341	6,299,424	1,712
Exit sign	734	115,737	13
High Bay	23,600	19,320,423	4,644
Linear Fluorescent	84,798	4,803,572	1,302
Occupancy Sensor	4,934	2,595,901	722

Table 2. Lighting Measures Installed Under SC Program

Measure Group	Count	kWh	kW
CFL	1,591	259,219	70
Exit sign	65	10,249	1
High Bay	12,615	9,012,270	2,166
Linear Fluorescent	17,195	1,359,650	369
Occupancy Sensor	4,803	2,226,515	623

The distribution of measure installations and savings by the measure groups defined above are shown in Figure 5 and in Figure 6.

Figure 5. Distribution of Lighting Measure Installation Counts by Measure Group

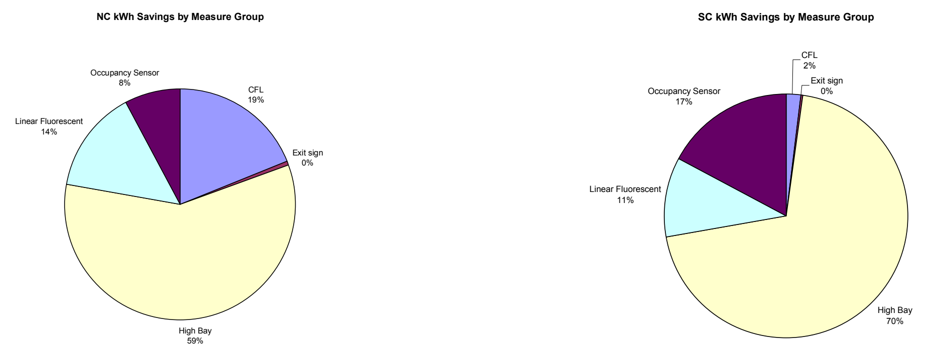

Figure 6. Distribution of Lighting Measure kWh Savings by Measure Group

Note, while high bay fixtures only accounted for 15% to 35% of the measure count, they accounted for 59% to 70% of the total lighting kWh savings, due to higher energy savings per measure.

Revised Tracking System Gross Energy and Demand Savings.

As mentioned above, the algorithms used by the program tracking database to record energy and demand savings were found to be in error. A set of revised energy and demand savings estimates was developed for each measure in the program tracking database using the unit savings estimates used during program planning. The unit kW and kWh savings[6] assigned to each lighting measure are shown in Table 3.

Table 3. Lighting Fixture Savings Assumptions

[6] Based on lighting fixture wattage data developed by Franklin Energy Services (FES) for Duke Energy

Fixture type	Standard Fixture Watts	Efficient fixture watts	kW savings per fixture	Assumed operating hours	kWh savings per fixture
CFL					
Compact Fluorescent Fixture	120	40	0.080	3680	294
Compact Fluorescent Screw in	60	20	0.040	3680	147
High Bay Lighting					
High Bay 2L T-5 High Output	215	122.5	0.093	4160	385
High Bay 3L T-5 High Output	290	182	0.108	4160	449
High Bay 4L T-5 High Output	455	243	0.212	4160	882
High Bay 6L T-5 High Output	455	365	0.090	4160	374
High Bay 8L T-5 High Output	1080	450	0.630	4160	2,621
High Bay Fluorescent 3 Lamp (F32 Watt T8)	215	133	0.082	4160	341
High Bay Fluorescent 4 Lamp (F32 Watt T8)	290	142	0.148	4160	616
High Bay Fluorescent 6 Lamp (F32 Watt T8)	455	224	0.231	4160	961
High Bay Fluorescent 8 Lamp (F32 Watt T8)	455	299	0.156	4160	649
2 High Bay 6L T-5 High Output replacing 1000W HID	1080	730	0.350	4160	1,456
2 High Bay Fluorescent 8LF32T8 - Replacing 1000W HID	1080	598	0.482	4160	2,005
42W 8 Lamp High Bay Compact Fluorescent	455	372	0.083	4160	345
Pulse Start Metal Halide	455	351	0.104	4160	433
High Performance T8					
High Performance T8 4ft 1 lamp, replacing standard T8	31	26	0.005	3680	18
High Performance T8 4ft 1 lamp, replacing T12-HPT8	43	26	0.017	3680	63
High Performance T-8 4ft 2 lamp replacing T-12 8ft 1 lamp	75	57	0.018	3680	66
High Performance T-8 4ft 2 lamp replacing T-12 High Output 8ft 1 lamp	113	66	0.047	3680	173
High Performance T8 4ft 2 lamp, replacing standard T8	58	50	0.008	3680	29
High Performance T8 4ft 2 lamp, replacing T12-HPT8	72	50	0.022	3680	81
High Performance T8 4ft 3 lamp, replacing standard T8	85	76	0.009	3680	33
High Performance T8 4ft 3 lamp, replacing T12-HPT8	115	76	0.039	3680	144
High Performance T-8 4ft 4 lamp replacing T-12 8ft 2 lamp	123	110	0.013	3680	48
High Performance T-8 4ft 4 lamp replacing T-12 High Output 8ft 2 lamp	207	127	0.080	3680	294
High Performance T8 4ft 4 lamp, replacing standard T8	112	98	0.014	3680	52
High Performance T8 4ft 4 lamp,	144	98	0.046	3680	169

Fixture type	Standard Fixture Watts	Efficient fixture watts	kW savings per fixture	Assumed operating hours	kWh savings per fixture
replacing T12-HPT8					
Standard T-8					
T-8 2ft 1 lamp	27.5	20	0.008	3680	28
T-8 2ft 2 lamp	43	33	0.010	3680	35
T-8 2ft 3 lamp	68	48	0.020	3680	74
T-8 2ft 4 lamp	85	63	0.022	3680	81
T-8 3ft 1 lamp	37	26	0.011	3680	40
T-8 3ft 2 lamp	53	43	0.010	3680	37
T-8 3ft 3 lamp	90	78	0.012	3680	44
T-8 3ft 4 lamp	106	86	0.020	3680	74
T-8 4ft 1 lamp	44	30	0.014	3680	52
T-8 4ft 2 lamp	77	60	0.017	3680	63
T-8 4ft 3 lamp	120	88	0.032	3680	118
T-8 4ft 4 lamp	150	112	0.038	3680	140
T-8 8ft 1 lamp	69	58	0.011	3680	40
T-8 8ft 2 lamp	132	112	0.020	3680	74
T-8 High Output 8 ft 1 Lamp	105	80	0.025	3680	92
T-8 High Output 8 ft 2 Lamp	210	160	0.050	3680	184
Low Watt T8					
High Performance Low Watt T8 4ft 1 lamp, replacing standard T8	31	23	0.008	3680	29
High Performance Low Watt T8 4ft 2 lamp, replacing standard T8	58	45	0.013	3680	48
High Performance Low Watt T8 4ft 3 lamp, replacing standard T8	85	68	0.017	3680	62
High Performance Low Watt T8 4ft 4 lamp, replacing standard T8	112	87	0.025	3680	92
Low Watt T8 lamps replacing standard 32 Watt T-8's	32	28	0.004	3680	15
T-5 and HO T-5					
T-5 1 Lamp with Electronic Ballast (replacing T-12 fixture)	44	32	0.012	3680	44
T-5 2 Lamp with Electronic Ballast (replacing T-12 fixture)	77	65	0.012	3680	44
T-5 3 Lamp with Electronic Ballast (replacing T-12 fixture)	120	93	0.027	3680	99
T-5 4 Lamp with Electronic Ballast (replacing T-12 fixture)	150	126	0.024	3680	88
T-5 High Output 1 Lamp with Electronic Ballast (replacing T-12 fixture)	77	62	0.015	3680	55
T-5 High Output 2 Lamp with Electronic Ballast (replacing T-12 fixture)	141	122	0.019	3680	70
T-5 High Output 3 Lamp with Electronic Ballast (replacing T-12 fixture)	210	185	0.025	3680	92
T-5 High Output 4 Lamp with Electronic Ballast (replacing T-12 fixture)	295	243	0.052	3680	191

Fixture type	Standard Fixture Watts	Efficient fixture watts	kW savings per fixture	Assumed operating hours	kWh savings per fixture
Exit Signs					
LED Exit Signs Electronic Fixtures (Retrofit Only)	22	4	0.018	8760	158

Unit demand and energy savings assumptions for LED fixtures and lighting controls[7] are shown in Table 4.

Table 4. Unit Demand and Energy Savings for LED and Lighting Control Measures

Fixture	KW/unit	KWh/unit
LED Auto Traffic Signals	0.085	275
LED Pedestrian Signals	0.044	150
Occupancy Sensors over 500 Watts	0.290	1068
Occupancy Sensors under 500 Watts	0.120	427

Customers indicated the annual operating hours of their lighting systems on the incentive applications. These self-reported lighting system hours of operation are entered into the program tracking database. A tabulation of the average self reported operating hours by building type are shown in Table 5.

[7] Based on lighting fixture energy and demand savings data developed by Franklin Energy Services (FES) for Duke Energy

Table 5. Self-Reported Lighting Operating Hours by Building Type

Building Description	Operating hour report frequency by building type	Average self-reported operating hours from program application
Education K-12	208	2,745
Education other	39	3,772
Elder Care/Nursing home	54	8,651
Fast Food	15	2,000
Full Service Restaurant	17	3,184
Healthcare	20	5,376
Industrial	193	5,466
Lodging	46	2,860
Office	95	3,010
other-institutional	11	5,211
other-mass	191	4,707
Public Assembly/Church	18	2,710
Public Order Safety	7	3,263
Religious Worship	3	2,109
Retail (Mall)	5	3,542
Retail (non-mall)	212	4,751
Service	24	3,255
Warehouse	53	4,183

The distribution of the self-reported operating hours by building type and fixture type is shown in Table 6:

Table 6. Self-Reported Lighting Operating Hours by Building and Fixture Type

Building Type	CFL	Linear fluorescent	High Bay
Education K-12	5,908	2,136	2,375
Education other	2,876	3,874	
Elder Care/Nursing home	8,467	8,760	
Fast Food	2,000		
Full Service Restaurant	3,154	3,280	
Healthcare	1,800	5,308	6,927
Industrial	8,736	4,676	5,945
Lodging	2,884	1,800	
Office	3,018	3,039	2,493
other-institutional		4,876	6,718
other-mass	7,304	3,946	5,979
Public Assembly/Church	2,467	3,107	2,526
Public Order Safety		3,248	3,300
Religious Worship	1,820	2,254	
Retail (Mall)	3,978	1,800	
Retail (non-mall)	4,919	4,689	4,843
Service	3,500	3,244	

Building Type	CFL	Linear fluorescent	High Bay
Warehouse		4,428	4,094

High Bay Lighting M&V Study

A sample of 35 customers installing High Bay Lighting fixtures was selected across NC and SC. A summary of the characteristics of the customers that participated for the High Bay Lighting Study is shown in Table 7 and Table 8.

Table 7. NC High Bay Lighting M&V Study Participants

Site	Business Type	Total fixtures rebated	Installed Fixture(s)	Baseline Fixture(s)
1	Education K-12	48	T8 High-bay- 4 ft 6 lamp	MH 400
2	Public Assembly/Church	20	T8 High-bay- 4 ft 6 lamp	MH 400
3	Public Assembly/Church	20	T8 High-bay- 4 ft 6 lamp	MH 400
4	Public Assembly/Church	25	T8 High-bay- 4 ft 6 lamp	MH 400
5	Public Assembly/Church	12	T8 High-bay- 4 ft 6 lamp	MH 400
6	Retail (non-mall)	503	T8 High-bay- 4 ft 6 lamp	MH 400
7	Retail (non-mall)	580	T8 High-bay- 4 ft 6 lamp	MH 400
8	Retail (non-mall)	477	T8 High-bay- 4 ft 6 lamp	MH 400
9	Retail (non-mall)	580	T8 High-bay- 4 ft 6 lamp	MH 400
10	Retail (non-mall)	589	T8 High-bay- 4 ft 6 lamp	MH 400
11	Retail (non-mall)	576	T8 High-bay- 4 ft 6 lamp	MH 400
12	Industrial	115	T5 HO High Bay 6L	MH 1000
13	Retail (non-mall)	48	T8 High-bay- 4 ft 6 lamp T8 High-bay- 4 ft 8 lamp	MH 400
14	Retail (non-mall)	66	T8 High-bay- 4 ft 6 lamp T8 High-bay- 4 ft 8 lamp	MH 400
15	Retail (non-mall)	49	T8 High-bay- 4 ft 6 lamp T8 High-bay- 4 ft 8 lamp	MH 400
16	Education K-12	15	T8 High-bay- 4 ft 4 lamp	Incandescent 500
17	Industrial	80	T5 HO High Bay 6L	MH 1000
18	Retail (non-mall)	49	T8 High-bay- 4 ft 6 lamp	MH 400
19	Education K-12	42	T5 HO High Bay 6L	MH 400
20	Education K-12	60	T8 High-bay- 4 ft 4 lamp	MH 400

Table 8. SC High Bay Lighting M&V Study Participants

Site	Business Type	Total fixtures rebated	Installed Fixture(s)	Baseline Fixture(s)
1	Warehouse	16	T5 HO High Bay 6L	MH 400
2	Warehouse	54	T8 High-bay- 4 ft 6 lamp	MH 400
3	Industrial	259	T8 High-bay- 4 ft 4 lamp	T12 HO 8 ft 2

Site	Business Type	Total fixtures rebated	Installed Fixture(s)	Baseline Fixture(s)
				lamp
4	other-mass	20	T5 HO High Bay 6L	MH 400
5	Retail (non-mall)	65	T8 High-bay- 4 ft 6 lamp	MH 400
6	Industrial	296	T5 HO High Bay 6L	MV 400
7	Office	66	T8 High-bay- 4 ft 6 lamp	MH 400
8	Industrial	40	T5 HO High Bay 4L	MH 400
9	Warehouse	54	T5 HO High Bay 4L	MH 400
10	Industrial	60	T5 HO High Bay 4L	MH 400
11	Retail (non-mall)	59	T8 High-bay- 4 ft 6 lamp T8 High-bay- 4 ft 8 lamp	MH 400
12	Retail (non-mall)	55	T8 High-bay- 4 ft 6 lamp T8 High-bay- 4 ft 8 lamp	MH 400
13	Retail (non-mall)	65	T8 High-bay- 4 ft 6 lamp T8 High-bay- 4 ft 8 lamp	MH 400
14	Retail (non-mall)	48	T8 High-bay- 4 ft 6 lamp T8 High-bay- 4 ft 8 lamp	MH 400
15	Retail (non-mall)	574	T8 High-bay- 4 ft 6 lamp	MH 400

Paper file applications and supporting documentation were obtained for each site. The data in the application files were reviewed and compared to the program tracking database and onsite survey observations. Discrepancies were noted and corrected for the impact evaluation. These discrepancies are reported in Table 9. Note, 2 of the projects in the sample were ineligible for the program, since they did not replace HID lighting systems.

Table 9. Tracking System and Paper File Discrepancies

State	Site	Discrepancy
NC	3	Pre fixtures not replaced one for one
	6	Pre fixtures not replaced one for one
	7	Pre fixtures not replaced one for one
	8	Pre fixtures not replaced one for one
	9	Pre fixtures not replaced one for one
	10	Pre fixtures not replaced one for one
	11	4 lamp T-8 fixtures indicated on application; but 2 lamp HO T-5 fixtures installed.
	12	Application operating hours > 8760
	12	Pre fixtures not replaced one for one
	16	4 lamp T-8 fixtures indicated on application, but 6 lamp T-8 fixtures installed. Replaced incandescent fixtures; program rules require metal halide.
	20	Application fixture count does not match survey
SC	1	4 lamp T-8 fixtures indicated on application, but 6 lamp T-8 fixtures installed
	3	Replaced fluorescent fixtures; program rules require metal halide.
	5	5 lamp T-8 fixtures indicated on application, but 6 lamp T-8 fixtures installed. 5 lamp fixture does not exist.
	6	Application fixture count does not match survey

	13	Combination of 6 and 8 lamp T-8 fixtures indicated on application, but only 6 lamp T-8 fixtures installed

Fixture watts reported in the manufacturer's catalogs (where available) were averaged and compared to the standard assumptions used in program design for several popular fixture types. This comparison is shown in Figure 7.

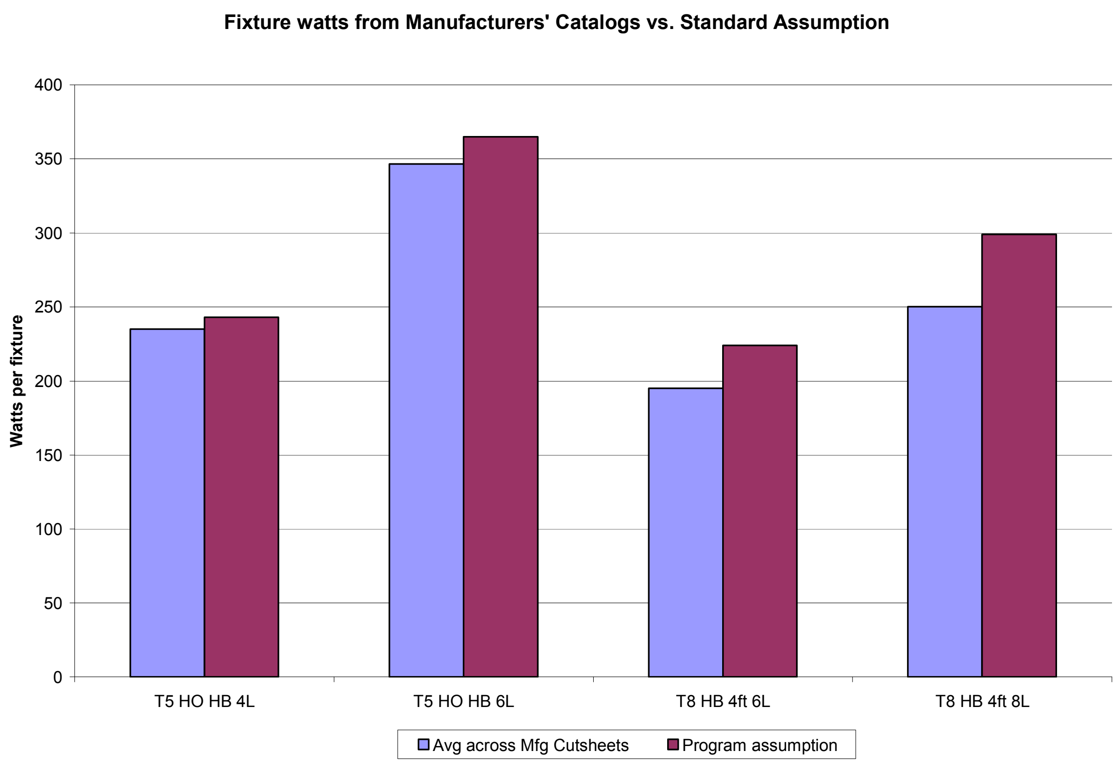

Figure 7. Comparison of Installed Fixture Watts from Manufacturers vs. Standard Assumptions

These data are also shown in Table 10.

Table 10. Comparison of Manufacturer's Fixture Watts with Standard Program Assumptions for High Bay Fixtures

Fixture	n	Program Assumption	Avg across Mfg Cutsheets
T5 HO HB 4L	4	243.0	235.0
T5 HO HB 6L	4	365.0	346.7
T8 HB 4ft 6L	26	224.0	195.1
T8 HB 4ft 8L	6	299.0	250.1

The average fixture watts from the manufacturer's catalogs matched the program design assumptions fairly well for T5 HO 4 lamp fixtures. The program design used higher (more conservative) assumptions for fixture watts for the T5 HO 6 lamp and the T8 4 ft 6 and 8 lamp fixtures.

The ability of the program applicants to accurately report the fixture watts on the program application was investigated. A comparison of the fixture watts on the application vs. the manufacturer's catalog data is shown in Figure 8 through Figure 10.

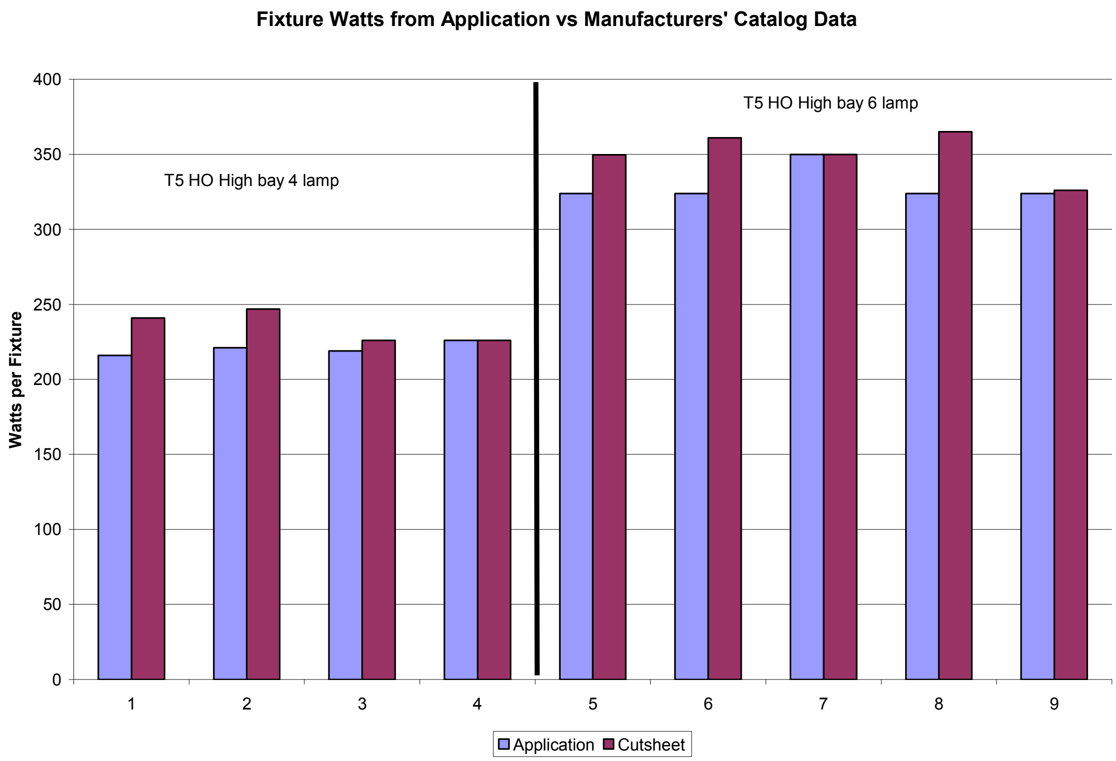

Figure 8. Comparison of Fixture Watts from Applications vs. Manufacturers' Catalog Data

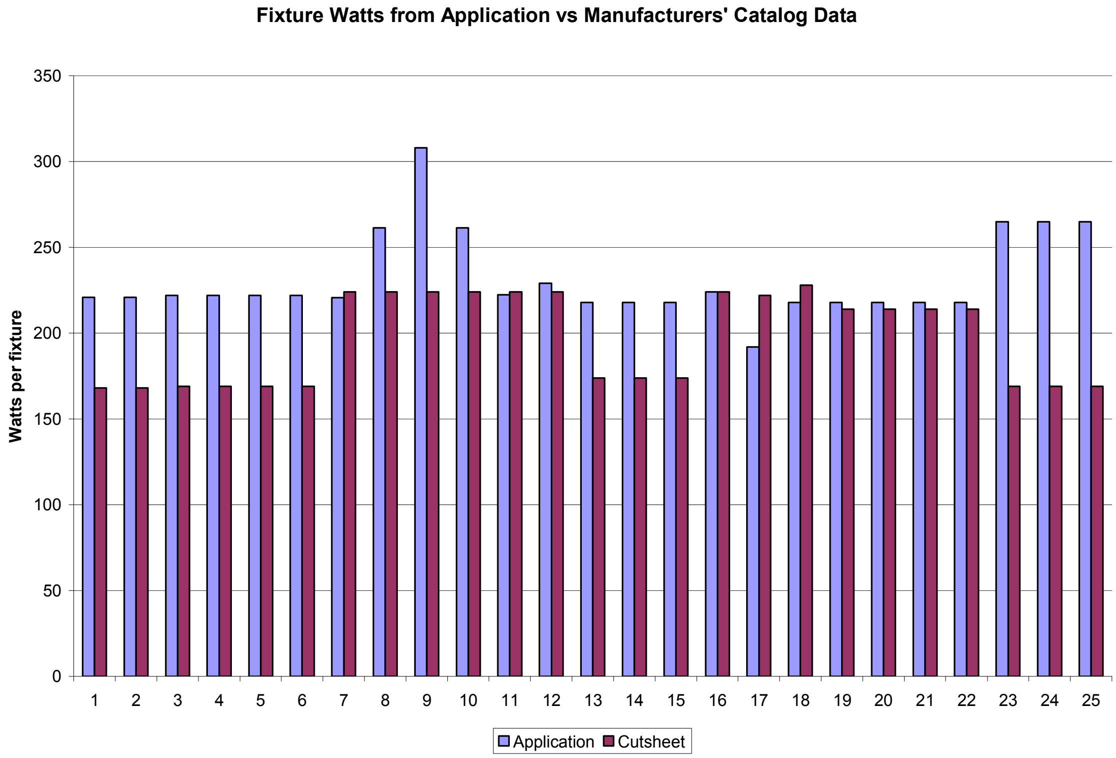

Figure 9. Comparison of Fixture Watts from Applications vs. Manufacturers' Catalog Data

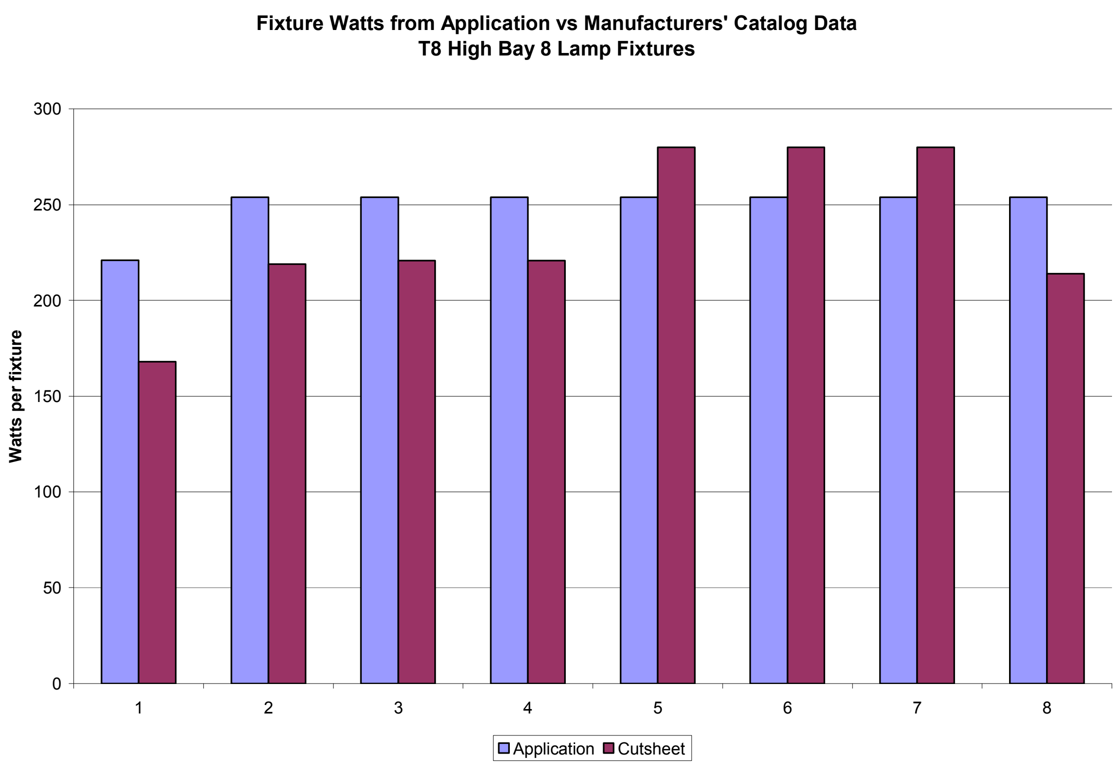

Figure 10. Comparison of Fixture Watts from Applications vs. Manufacturers' Catalog Data

Customer self reports of installed fixture watts varied widely from the data reported in the manufacturer's catalogs.

The fixture quantities installed at the sampled sites along with the number of light loggers deployed are shown in Table 11 and Table 12. Light loggers were deployed to monitor the on/off behavior of the lighting systems based on the circuiting and switching of the lighting systems. Due to group switching of multiple high bay fixtures, it was possible to monitor the on/off behavior of many fixtures with each light logger.

Table 11. Logger Installations at NC M&V Study Sites

Site	Business Type	Total fixtures rebated	Loggers installed
1	Education K-12	48	4
2	Public Assembly/Church	20	2
3	Public Assembly/Church	20	2
4	Public Assembly/Church	25	3
5	Public Assembly/Church	12	2
6	Retail (non-mall)	503	5
7	Retail (non-mall)	580	5
8	Retail (non-mall)	477	5
9	Retail (non-mall)	580	5
10	Retail (non-mall)	589	5
11	Retail (non-mall)	576	6
12	Industrial	115	5
13	Retail (non-mall)	48	4
14	Retail (non-mall)	66	5
15	Retail (non-mall)	49	4
16	Education K-12	15	2
17	Industrial	80	4
18	Retail (non-mall)	49	3
19	Education K-12	42	3
20	Education K-12	60	6

Table 12. Logger Installations at SC M&V Study Sites

Site	Business Type	Total fixtures rebated	Loggers installed
1	Warehouse	16	2
2	Warehouse	54	3
3	Industrial	259	4
4	other-mass	20	2
5	Retail (non-mall)	65	4
6	Industrial	296	0[8]
7	Office	66	5

[8] Lighting operation verified as always on (8760 hr per year). Logging not required.

Site	Business Type	Total fixtures rebated	Loggers installed
8	Industrial	40	2
9	Warehouse	54	4
10	Industrial	60	4
11	Retail (non-mall)	59	4
12	Retail (non-mall)	55	4
13	Retail (non-mall)	65	3
14	Retail (non-mall)	48	4
15	Retail (non-mall)	574	5

The light logger data were downloaded by the Duke Energy contractors, with assistance from Duke Energy evaluation staff. These data were processed by engineers from Architectural Energy Corporation. The results are shown in Table 13 and Table 14.

Table 13. NC Lighting Logger Study Results

Site	Business Type	Application self reported annual operating hours	Logger study annual operating hours	Ratio logged / self report	Coincident demand factor
1	Education K-12	2,400	3,285	1.37	0.88
2	Public Assembly/Church	2,416	3,048	1.26	0.50
3	Public Assembly/Church	2,416	2,213	0.92	0.73
4	Public Assembly/Church	2,416	2,673	1.11	0.48
5	Public Assembly/Church	2,416	3,354	1.39	0.92
6	Retail (non-mall)	5,668	7,774	1.37	1.00
7	Retail (non-mall)	6,000	6,216	1.04	1.00
8	Retail (non-mall)	5,880	6,414	1.09	1.00
9	Retail (non-mall)	5,269	6,321	1.20	1.00
10	Retail (non-mall)	5269	8,184	1.55	1.00
11	Retail (non-mall)	5,269	6,651	1.26	1.00
12	Industrial	16,000	2,428	0.15	0.70
13	Retail (non-mall)	4,576	6,060	1.32	0.98
14	Retail (non-mall)	4,576	6,587	1.44	1.00
15	Retail (non-mall)	4,576	4,991	1.09	1.00
16	Education K-12	2,400	840	0.35	0.02
17	Industrial	8,760	7,537	0.86	0.94
18	Retail (non-mall)	4,500	5,101	1.13	1.00
19	Education K-12	2,500	2,399	0.96	0.92
20	Education K-12	2,500	2,386	0.85	0.87
	Average			0.98	

Table 14. SC Lighting Logger Study Results

Site	Business Type	Application self reported annual operating hours	Logger study annual operating hours	Ratio logged / self report	Coincident demand factor

Site	Business Type	Application self reported annual operating hours	Logger study annual operating hours	Ratio logged / self report	Coincident demand factor
1	Warehouse	2,600	2,578	0.99	0.90
2	Warehouse	2,500	3,065	1.23	1.00
3	Industrial	2,600	2,917	1.12	0.85
4	other-mass	3,358	2,768	0.82	0.95
5	Retail (non-mall)	4,500	3,597	0.80	0.98
6	Industrial	6,240	8,760	1.40	1.00
7	Office	4,250	4,775	1.12	0.97
8	Industrial	5,760	5,369	0.93	0.60
9	Warehouse	2,860	2,628	0.92	0.95
10	Industrial	8,600	8,600	1.00	1.00
11	Retail (non-mall)	4,576	5,050	1.10	1.00
12	Retail (non-mall)	4,576	6,309	1.38	1.00
13	Retail (non-mall)	4,576	8,726	1.91	1.00
14	Retail (non-mall)	4,576	5,671	1.24	0.95
15	Retail (non-mall)	5,269	6,767	1.28	0.95
	Average			1.15	

On average, the light logger study predicted about 2% fewer operating hours in NC and 15% more hours in SC than the customer self reports.

The light logger results were combined with the verified fixture counts and verified installed fixture watts to estimate the actual energy and peak demand savings. These results are shown in Table 15 and Table 17 as Eval kWh and Eval kW. These results were compared to the tracked savings based on the fixture counts and standard per fixture kW and kWh savings estimates from DSMore[9]. The ratio of the evaluated savings to the program planning estimated savings is expressed as a realization rate (RR) for both kWh and kW.

Table 15. Results of NC High Bay Lighting M&V Study

Site	Business Type	Eval kWh	DSMore kWh	RR (kWh)	Eval kW	DSMore kW	RR (kW)
1	Education K-12	45,251	42,384	107%	12.8	10.2	125%
2	Public Assembly/Church	17,433	19,220	91%	5.3	4.6	115%
3	Public Assembly/Church	13,406	19,220	70%	6.1	4.6	133%
4	Public Assembly/Church	19,114	24,025	80%	7.2	5.8	124%
5	Public Assembly/Church	11,510	11,532	100%	3.4	2.8	121%
6	Retail (non-mall)	626,369	483,383	130%	80.6	116.2	69%
7	Retail (non-mall)	689,433	557,380	124%	110.9	134	83%

[9] DSMore inputs accept non-coincident kW savings. Coincidence factors are applied during the DSMore run. Demand savings are show as non-coincident kW for consistency.

Site	Business Type	Eval kWh	DSMore kWh	RR (kWh)	Eval kW	DSMore kW	RR (kW)
8	Retail (non-mall)	440,972	458,397	96%	68.7	110.2	62%
9	Retail (non-mall)	701,084	557,380	126%	110.9	134	83%
10	Retail (non-mall)	961,311	566,029	170%	117.5	136.1	86%
11	Retail (non-mall)	741,969	553,536	134%	111.6	133.1	84%
12	Industrial	197,967	43,010	460%	81.5	10.4	784%
13	Retail (non-mall)	75,223	38,640	195%	12.4	9.3	133%
14	Retail (non-mall)	113,273	54,378	208%	17.2	13.1	131%
15	Retail (non-mall)	63,605	40,225	158%	12.7	9.7	131%
16	Education K-12	3,478	9,240	38%	3.9	2.2	177%
17	Industrial	90,450	29,920	302%	12	7.2	167%
18	Retail (non-mall)	57,736	47,089	123%	11.3	11.3	100%
19	Education K-12	9,471	15,708	60%	3.7	3.8	97%
20	Education K-12	14,297	52,920	27%	6	12.7	47%
	Total	**4,893,352**	**3,623,616**	**135%**	**796**	**871**	**91%**

Table 16. Results of SC High Bay Lighting M&V Study

Site	Business Type	Eval kWh	DSMore kWh	RR (kWh)	Eval kW	DSMore kW	RR (kW)
1	Warehouse	4,332	5,984	72%	1.6	1.4	114%
2	Warehouse	37,136	51,894	72%	12.1	12.5	97%
3	Industrial	497,122	159,544	312%	161.4	38.3	421%
4	other-mass	4,982	7,480	67%	1.7	1.8	94%
5	Retail (non-mall)	54,009	40,040	135%	15	9.6	156%
6	Industrial	135,202	110,704	122%	15.4	26.6	58%
7	Office	71,545	63,426	113%	15	15.2	99%
8	Industrial	44,671	35,280	127%	7.1	8.5	84%
9	Warehouse	32,500	47,628	68%	12.4	11.4	109%
10	Industrial	118,164	52,920	223%	13.7	12.7	108%
11	Retail (non-mall)	70,033	48,587	144%	13.9	11.7	119%
12	Retail (non-mall)	72,800	44,743	163%	11.5	10.8	106%
13	Retail (non-mall)	138,560	53,729	258%	15.9	12.9	123%
14	Retail (non-mall)	64,230	39,264	164%	11.3	9.4	120%
15	Retail (non-mall)	984,882	551,614	179%	145.7	132.6	110%
	Total	**2,330,167**	**1,312,837**	**178%**	**454**	**315**	**144%**

In North Carolina, the average realization rates for kWh and kW for the sample are 135% and 91% respectively. Thus, the evaluation study estimated about 35% more kWh savings and about 9% less coincident demand savings than the program planning assumptions.

In South Carolina, the average realization rates for kWh and kW for the sample are 178% and 144% respectively. Thus, the evaluation study estimated about 78% more kWh savings and about 44% more coincident demand savings than the program planning assumptions.

Table 17. Results of NC High Bay Lighting M&V Study – Eligible Fixtures Only

Site	Business Type	Eval kWh	DSMore kWh	RR (kWh)	Eval kW	DSMore kW	RR (kW)
1	Education K-12	45,251	42,384	107%	12.8	10.2	125%
2	Public Assembly/Church	17,433	19,220	91%	5.3	4.6	114%
3	Public Assembly/Church	13,406	19,220	70%	6.1	4.6	132%
4	Public Assembly/Church	19,114	24,025	80%	7.2	5.8	123%
5	Public Assembly/Church	11,510	11,532	100%	3.4	2.8	123%
6	Retail (non-mall)	1,118,287	483,383	231%	143.9	116.2	124%
7	Retail (non-mall)	1,031,154	557,380	185%	165.9	134.0	124%
8	Retail (non-mall)	875,067	458,397	191%	136.4	110.2	124%
9	Retail (non-mall)	1,048,579	557,380	188%	165.9	134.0	124%
10	Retail (non-mall)	1,378,572	566,029	244%	168.5	136.1	124%
11	Retail (non-mall)	1,095,713	553,536	198%	164.7	133.1	124%
12	Industrial	203,910	43,010	474%	84.0	10.4	808%
13	Retail (non-mall)	75,223	38,640	195%	12.4	9.3	133%
14	Retail (non-mall)	113,273	54,378	208%	17.2	13.1	131%
15	Retail (non-mall)	63,605	40,225	158%	12.7	9.7	131%
16	Education K-12	0	9,240	0%	0.0	2.2	0%
17	Industrial	90,450	29,920	302%	12.0	7.2	167%
18	Retail (non-mall)	57,736	47,089	123%	11.3	11.3	100%
19	Education K-12	9,471	15,708	60%	3.7	3.8	98%
20	Education K-12	14,297	52,920	27%	6.0	12.7	47%
	Total	**7,282,051**	**3,623,616**	**201%**	**1139.3**	**871.3**	**131%**

Table 18. Results of SC High Bay Lighting M&V Study – Eligible Fixtures Only

Site	Business Type	Eval kWh	DSMore kWh	RR (kWh)	Eval kW	DSMore kW	RR (kW)
1	Warehouse	4,332	5,984	110%	1.6	1.4	110%
2	Warehouse	37,136	51,894	97%	12.1	12.5	97%
3	Industrial	0	159,544	0%	0.0	38.3	0%
4	other-mass	4,982	7,480	95%	1.7	1.8	95%
5	Retail (non-mall)	54,009	40,040	156%	15.0	9.6	156%
6	Industrial	277,990	110,704	251%	31.7	26.6	119%
7	Office	71,545	63,426	98%	15.0	15.2	98%
8	Industrial	44,671	35,280	83%	7.1	8.5	83%
9	Warehouse	32,500	47,628	108%	12.4	11.4	108%
10	Industrial	118,164	52,920	108%	13.7	12.7	108%
11	Retail (non-mall)	70,033	48,587	119%	13.9	11.7	119%
12	Retail (non-mall)	72,800	44,743	107%	11.5	10.8	107%
13	Retail (non-mall)	138,560	53,729	123%	15.9	12.9	123%
14	Retail (non-mall)	64,230	39,264	120%	11.3	9.4	120%

Site	Business Type	Eval kWh	DSMore kWh	RR (kWh)	Eval kW	DSMore kW	RR (kW)
15	Retail (non-mall)	1,110,071	551,614	124%	164.2	132.6	124%
	Total	**2,021,053**	**1,312,837**	**160%**	**327.1**	**315.4**	**104%**

When ineligible fixtures are removed, the total realization rates for kWh and kW for the sample change to 201% and 131% respectively in NC and 160% and 104% respectively in SC. The increase in realization rate when ineligible fixtures are removed is driven mostly by the sites in North Carolina where additional fixtures were installed beyond a one for one change out, causing an increase in connected lighting load in the post retrofit case. When these fixtures are removed from the analysis, the energy savings increase.

Total Gross and Net Impacts

The total first year gross savings are tabulated by measure type in Table 19 and Table 20. Note, only high bay lighting measures were adjusted at this time.

Table 19. Total First Year Gross Energy Savings for Lighting Measures in North Carolina

Measure type	Program Tracking kW	Program Tracking kWh	kW realization Rate	kWh realization Rate	Evaluated Gross kW	Evaluated Gross kWh
High bay	4,644	19,320,423	**131%**	**201%**	6,084	38,834,051
Linear Fluorescent	1,302	4,803,572	100%	100%	1,302	4,803,572
CFL	1,712	6,299,424	100%	100%	1,712	6,299,424
Occupancy Sensor	722	2,595,901	100%	100%	722	2,595,901
Other lighting	11	115,737	100%	100%	11	115,737
Total	8,391	33,135,057	117.2%	158.9%	9,831	52,648,685

Table 20. Total First Year Gross Energy Savings for Lighting Measures in South Carolina

Measure type	Program Tracking kW	Program Tracking kWh	kW realization Rate	kWh realization Rate	Evaluated Gross kW	Evaluated Gross kWh
High bay	2,166	9,012,270	**104%**	**160%**	2,253	14,419,632
Linear Fluorescent	369	1,359,650	100%	100%	369	1,359,650
CFL	70	259,219	100%	100%	70	259,219
Occupancy Sensor	623	2,226,515	100%	100%	623	2,226,515
Other lighting	11	10,249	100%	100%	11	10,249
Total	3,240	12,867,903	102.7%	142%	3,326	18,275,265

The first year net savings are calculated assuming a freeridership level of 70% as described in the Free-ridership Section above.

Table 21. Total First Year Net Energy Savings for Lighting Measures in North Carolina

Measure type	Evaluated Gross kW	Evaluated Gross kWh	Net to Gross Ratio	Evaluated Net kW	Evaluated Net kWh
High bay	6,084	38,834,051	0.7	4,259	27,183,835
Linear Fluorescent	1,302	4,803,572	0.7	912	3,362,500
CFL	1,712	6,299,424	0.7	1,198	4,409,597
Occupancy Sensor	722	2,595,901	0.7	505	1,817,131
Other lighting	11	115,737	0.7	8	81,016
Total	9,831	52,648,685		6,882	36,854,079

Table 22. Total First Year Net Energy Savings for Lighting Measures in South Carolina

Measure type	Evaluated Gross kW	Evaluated Gross kWh	Net to Gross Ratio	Evaluated Net kW	Evaluated Net kWh
High bay	2,253	13,878,895	0.7	1,577	10,093,742
Linear Fluorescent	369	1,359,650	0.7	259	951,755
CFL	70	259,219	0.7	49	181,453
Occupancy Sensor	623	2,226,515	0.7	436	1,558,561
Other lighting	11	10,249	0.7	7	7,174
Total	3,326	17,734,529		2,329	12,792,685

Lifecycle savings were estimated by applying the following effective useful life (EUL) assumptions[10] to each measure.

Table 23. Effective Useful Life for Lighting Measures

Measure Type	Measure	EUL (years)
Lighting	CFL	12
	Exit sign	15
	HiBay Lighting	10
	Linear Fluorescent	10
	Occupancy Sensor	8
	Other lighting controls	12

Applying the EUL estimates listed above to each measure, the lifecycle gross and net kWh savings are shown below:

[10] EUL data supplied by FES

Table 24. Lifecycle Gross and Net Savings for the Lighting Component of NC Commercial Smart Saver Prescriptive Program for 11 months of Program Operation Ending April 30, 2010

Result	Value
Tracking System Lifecycle Gross Savings	339,336,304
Evaluated Lifecycle Gross kWh savings	534,472,579
Evaluated Lifecycle Net kWh savings	374,130,805

Table 25. Lifecycle Gross and Net Savings for the Lighting Component of SC Commercial Smart Saver Prescriptive Program for 11 months of Program Operation Ending April 30, 2010

Result	Value
Tracking System Lifecycle Gross Savings	124,795,687
Evaluated Lifecycle Gross kWh savings	178,838,546
Evaluated Lifecycle Net kWh savings	125,186,982

Appendix A: Vendor Interview Instrument

Name: ____

Title: ____

Position description and general responsibilities:

____

____

____

We are conducting this interview to obtain your opinions about and experiences with the Smart Saver Prescriptive Program. We'll talk about your understanding of the Smart Saver Program and its objectives, your thoughts on improving the program, and the technologies the program covers. The interview will take about an hour to complete.

Understanding the Program

We would like to ask you about your understanding of the Smart Saver program. We would like to start by first asking you to…

1. Please review for me how you are involved in the program and the steps you take in the participation process. Walk me though the typical steps you take to help a customer become aware of the program, screen the customer for eligibility for this program and what you do to receive or help the customer receive the program incentive.

2. What is your overall opinion of the program?

3. What specifically do you like about the program or the way it operates?

4. What do you dislike about the program, or what is it that you would like to see changed and why is that change needed?

5. What kinds of issues have come up in the Smart Saver program?

6. What are the different types of reactions you see from customers when you tell them about the program?

7. Have you heard of any customer complaints that are in any way associated with this program?

8. Have callbacks increased due to the program technologies?

Program Design and Design Assistance

9. Do you feel that the right mix and types of technologies and equipment are covered by the program?

10. Tell me about how the customers react to the incentive levels.

11. Are the incentive levels appropriate?

12. What would the incentive need to be in order to have more than 80 percent of the market go with the energy efficient model?

13. Are there other technologies or energy efficient systems that you think should be included in the program?

14. Are there components that are now included that you feel should not be included in the prescriptive program? What are they and why should they not be included?

Reasons for Participation in the Program

We would like to better understand why contractors become partners in the Smart Saver Program.

15. How long have you been a partner in the Smart Saver Program?

16. What are your primary reasons for participating in the program? Why do you continue to be a partner? If prompts are needed… Is this a wise business move for you, is it something you believe in professionally, is it that it provides a service to your customers, or other reasons?

17. Why do you think other trade allies become partners in the program?

18. What are the reasons why trade allies like yourself would not want to become partners in the program?

19. Has this program made a difference in your business? How? Be as specific as you can and talk sales volumes, profits, customer relationships and any other aspect that you think is important.

20. What does Duke Energy need to do to get more contractors and trade allies to participate in this program?

Program Participation Experiences

The next few questions ask about the process for submitting participation forms and obtaining the incentive payments.

21. Let's start with Marketing. How can marketing be improved?

22. And what about the application and processing aspects?

23. How about the payment and incentive processing aspects?

24. How long does it take between the time that you apply for your incentive, to the time that you and/or your customer receive the payments? Is this a reasonable amount of time? What should it be? Why?

25. Do you have the right amount of materials such as forms, information sheets, brochures or marketing materials that you need to effectively show and sell your Smart Saver technologies? What else do you need?

26. Do you feel that communications between you and Duke's Smart Saver program staff is adequate? How might this be improved?

27. What do you think are the primary benefits to the people who buy Smart Saver-eligible measures? Are there other benefits that are important to a potential customer?

Market Impacts and Effects

28. How do you make your customers aware of the Program? (if not covered earlier)

29. Are your customers more satisfied with the higher efficiency equipment? Why or why not?

30. Do you have fewer calls or more calls to correct problems with the Smart Saver technologies?

31. Do you market or sell the Smart Saver equipment differently than your other equipment? How?

32. Has the program influenced you to carry other energy efficient equipment that is not rebated through the program?

33. If yes, what do you now carry?

34. If yes, About how many of these units did you install/sell in the last year?

35. Do you think the program is making more people aware of the benefits of being more energy efficient?

36. Have you not iced changes in your sales patterns where you think customers are asking for more energy efficient equipment? If yes… Why do you think this is / or is not happening?

37. Are programs like Smart Saver having an impact on what models of products are being manufactured and distributed to distributors, dealers, retailers and contactors?

Net to Gross Questions

38. Has the program influenced your decision to market or sell more high efficiency measures than you would have without the program? If yes, to what extent?

39. How much difference does the program make to the customer's decision to move up to the more energy efficient model?

40. What percent of your customers fall in to the each of these groups,
    a. Makes a great difference and allows them to obtain the more efficient model;
    b. Makes somewhat of a difference in their choice;
    c. Makes little or no difference and does not affect their choice?

41. Can you tell me why this occurs for each of the three groups above?

42. We would like to obtain an understanding of the program's effects on sales of high efficiency models. We would like your best estimate of the number of units your company sold over the last 12 months; the percent of sales that were high efficiency units, and the percent of the high efficiency models that got a Duke rebate. Estimates are fine, we are not looking for exact numbers, but good estimates will help us understand the impacts of the program and the potential for additional sales.

I would like to start with <<*Technology 1*>>

a. Total units sold: ___ Percent high EE: ___% Percent getting a Duke rebate: ___

Now let's go to <<*Technology 2*>>

b. Total units sold: ___ Percent high EE: ___% Percent getting a Duke rebate: ___

And for <<*Technology 3*>>

c. Total units sold: ___ Percent high EE: ___% Percent getting a Duke rebate: ___

And for <<*Technology 4*>>

d. Total units sold: ___ Percent high EE: ___% Percent getting a Duke rebate: ___

43. Programs such as these might have the potential to increase sales of high efficiency products in two ways. One is through rebates and incentives that reduce the cost barrier. The other is via market effects in which programs can impact customer demand as well as the manufacturing and distribution process. To help us understand these potential changes we would like to know if the program may have influenced your overall ordering, stocking and sales practices. Were you selling the same number of high efficiency models before you became a Duke partner, or has the program influenced the total number of high efficiency units you sell?

44. *If influenced:* How as the Duke program changed the number of units you sell?

45. What was your total volume of high efficiency <*technology a*> unit sales before the program and what is it now? Before __________ After ________________

46. What was your total volume of high efficiency <*technology b*> unit sales before the program and what is it now? Before __________ After ________________

47. What was your total volume of high efficiency <*technology c*> unit sales before the program and what is it now? Before __________ After ________________

48. There are no plans to terminate the program, but we would like to know how the program affects contractors. If the program were to be discontinued, what would happen to the volume of sales of the high efficiency models?
49. How would this change your ordering and stocking practices?

50. If the program were not offered, would you need to structure pricing differently to make up for the program loss? If so, how?

51. In your opinion is the Smart Saver program still needed? Why?

Recommended Changes from the Participating Contractors

52. Are there any other changes that you would recommend to Duke Energy for the Smart Saver Program that we have not already discussed?

53. If you could make any changes to this program, what changes would you make to this program?

Appendix B: Participant Survey Instrument

Name: ____

Title: ____

Hello, my name is ______. I am calling on behalf of Duke Energy to conduct a customer survey about the Smart Saver Incentive Program. May I speak with _____________ please?
If person talking, proceed. If person is called to the phone reintroduce.
If not home, ask when would be a good time to call and schedule the call-back:

Call back 1:	Date: ___________,	Time: _______________	❑AM or ❑PM
Call back 2:	Date: ___________,	Time: _______________	❑AM or ❑PM
Call back 3:	Date: ___________,	Time: _______________	❑AM or ❑PM
Call back 4:	Date: ___________,	Time: _______________	❑AM or ❑PM
Call back 5:	Date: ___________,	Time: _______________	❑AM or ❑PM
Call back 6:	Date: ___________,	Time: _______________	❑AM or ❑PM
Call back 7:	Date: ___________,	Time: _______________	❑AM or ❑PM
	❑ Contact dropped after seventh attempt.		

We are conducting this survey to obtain your opinions about the Smart Saver Incentive Program in which you participated. We are not selling anything. The survey will take about 10-15 minutes and your answers will be confidential, and will help us to make improvements to the program to better serve others. May we begin the survey?

Note: If this is not a good time, ask if there is a better time to schedule a callback.

1. **Do you recall participating in the Smart Saver Program?**

1. ❑ Yes, *begin* → *Skip to Q3.*
2. ❑ No,
99. ❑ DK/NS

This program was provided through Duke Energy. In this program, your company purchased a new energy efficient motor, pump, HVAC system or component, or lighting system. Duke Energy provided an incentive of <$xxx> **for purchasing the qualifying item.**

Do you remember participating in this program?

1. ❑ Yes, *begin* → *Go to Q2.*
2. ❑ No,
99. ❑ DK/NS

If No or DK/NS terminate interview and go to next participant.

2. **Our records indicate that you purchased a** <incented item> **Is this correct? If not, what was the rebated technology that you purchased?**

1. ❑ Correct
2. ❑ Pump
3. ❑ Motor
4. ❑ HVAC
5. ❑ Lighting
6. ❑ Refrigeration
7. ❑ Other specify: ____

3. **Please think back to the time when you were deciding to buy the energy saving** <incented item>, **perhaps recalling things that occurred in your company shortly before and after your purchase. What kinds of factors motivated you to purchase energy saving <** incented item>? *(do not read list, place a "1" next to the response that matches best)*

---

1. ____ Old equipment didn't work
2. ____ Old equipment working poorly
3. ____ The program incentive
4. ____ The program technical assistance
5. ____ Recommendation of someone else (*Probe*: **Who?**___________)
6. ____ Wanted to reduce energy costs
7. ____ The information provided by the Program
8. ____ Past experience with this program
9. ____ Because of past experience with another Duke Energy program
10. ____ Recommendation from other utility program
    i. (*Probe*: **What program?** ___________________________)
11. ____ Recommendation of dealer/contractor
12. ____ Advertisement in newspaper (*Probe:* **For what program?** ___________)
13. ____ Radio advertisement (*Probe:* **For what program?** ___________)
14. ____ Other (SPECIFY) ____

15. ____ Don’t know/don’t remember/not sure (DK/NS)

If multiple responses: 2.a. **Were there any other reasons?** *(number responses above in the order they are provided - Repeat until ‘no’ response.)*

4. **Did you get this** < incented item> **to replace an existing** < incented item>**?**

    1. ❑ Yes – *skip to question 8*
    2. ❑ No
    3. ❑ DK/NS – *skip to question 11*

5. **Is this** < incented item> **the first you have ever purchased for your company?**

    1. ❑ Yes – *skip to question 11*
    2. ❑ No
    3. ❑ DK/NS – *skip to question 11*

6. **Did you get this** < incented item> **because you wanted to add another/more** < incented item> **to your facility?**

    1. ❑ Yes
    2. ❑ No
    3. ❑ Don’t Know – *skip to question 11*

7. **About how old was the** < incented item> **you replaced?**

    1. ❑ Less than 5 years old
    2. ❑ 5 to less than 10 years old
    3. ❑ 10 to less than 20 years old
    4. ❑ 20 years to less than 30 years old
    5. ❑ 30 or more years old
    99. ❑ Don’t Know

8. **Was the old** < incented item> **working or not working?**

    1. ❑ Yes, working
    2. ❑ No, not working – *skip to question 11*
    3. ❑ Don’t Know

9. **Was the old** < incented item> **in good, fair, or poor working condition?**

1. ❑ Good
2. ❑ Fair
3. ❑ Poor
4. ❑ Don't Know

10. Who filled out the program incentive forms for your company?

a. ❑ I did
b. ❑ Someone from my company did
c. ❑ The contractor
d. ❑ The salesperson
e. ❑ Someone from Duke Energy

11. Who submitted the forms to Duke Energy?

a. ❑ I did (customer)
b. ❑ Someone from my company did
c. ❑ The contractor
d. ❑ The salesperson
e. ❑ Someone from Duke Energy

11a. If they filled it out. **Was the incentive form easy to understand?**

1. ❑ Yes
2. ❑ No
3. ❑ Some of it
99. ❑ DK/NS

If no or some of it, 8b. **Do you remember what it was that was not clear or which part of it was difficult?**

____

____

12. **Did you have any problems receiving the incentives?**

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

If yes, 9b. **Please explain the problem and how it was resolved. Was it resolved to your satisfaction?**

____

____

Free-Ridership Questions

13. **At the time that you first heard about the Smart Saver Program from Duke Energy, had you…?**

1. ❑ **Already been thinking about purchasing** < incented item>
2. ❑ **Already begun collecting information about** < incented item> **or**
3. ❑ **Already decided to buy the** < incented item>**?**
4. ❑ Don't Know

14. Just to be sure I understand, did you have specific plans to install the high efficiency < incented item**> before you heard about the program?**

1. ❑ Yes
2. ❑ No – *skip to question 14*
3. ❑ Don't Know – *skip to question 14*

15. **Did you have to make any changes to your existing equipment replacement plans in order to receive this rebate through the Smart Saver Program?**

1. ❑ Yes
2. ❑ No
3. ❑ Don't Know

16. **If the rebate from Duke Energy's Smart Saver Program had not been available, would you still have:**

16a. **Purchased the same type of** < incented item>**?**

1. ❑ Yes
2. ❑ No – *skip to question 16*
3. ❑ Don't Know – *skip to question 16*

16b. **Purchased the same energy efficiency of** < incented item>?

1. ❑ Yes
2. ❑ No
3. ❑ Don't Know

16c. **Purchased the** < incented item> **at the same time that you did?**

1. ❑ Yes – *skip to question 15*
2. ❑ No
3. ❑ Don't Know – *skip to question 15*

16d. **Purchased the** < incented item> **earlier than you did, or later?**

1. ❑ Earlier
2. ❑ Same Time
3. ❑ Later
4. ❑ Don't Know – *skip to question 15*

16e. **How much <earlier/later>?**

1. _________ years and/or _________months
2. ❑ Don't Know

17. **If the rebate from the Smart Saver Program had not been available, would you have done anything else differently?**

1. ❑ Yes
2. ❑ No
3. ❑ Don't Know

17a. **What would you have done differently?**

____

____

18. **On a 0 to 10 scale, with 0 being not at all likely and 10 being very likely, how likely is it that you would have bought a less efficient** < incented item> **if you had not received any rebate from the program?**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

I'm going to read several statements about how you came to choose your < incented item>**. On a scale of 0 to 10, where 0 is strongly disagree and 10 is strongly agree, how much do you agree with this statement?**

19**. If I had not had any assistance from the program, I would have paid the additional** <$xxx> **to buy the energy efficient** < incented item> **on my own?**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

20. **The rebate from the Duke Energy Smart Saver Program was a critical factor in my decision to purchase the high efficiency/energy efficient product.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

21**. I would have bought the same make and model of the** < incented item> **within one year of when I did even without the rebate from the Duke Energy Smart Saver Program.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

22. **The rebate from the Duke Energy Smart Saver Program was not necessary to cause me to purchase the higher efficiency product when your company bought the new** < incented item>**.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

Consistency Check & Resolution

23 will be asked only for those respondents who have a clear inconsistency between responses (i.e., all but one of the questions are at one end of the spectrum for free ridership while one question is at the other spectrum.) An algorithm will be provided after pretesting. The question responses that will be used to trigger 21 are:

- 14a (only for efficiency enhancement measures)
- 14b (only for incremental efficiency measures)
- 16 depending upon which version of the question they received
- 18
- 19
- 20

23. **Let me make sure I understand you. Earlier, you said <**inconsistency prompted by excel function**>, but that differs from some of your other responses. Please tell me in your own words what influence, if any, the program had on your decision to purchase and install the** < incented item> **at the time you did?**

____
____
____
____

Based on response, correct any above entries.

Spillover Questions

24. **Since you participated in the Smart Saver Program, have you purchased and installed any other type of high efficiency equipment or made energy efficiency improvements at your company or at any other locations?**

1. ❑ Yes, only at this company
2. ❑ Yes, only at other locations
3. ❑ Yes, at both company and other locations
4. ❑ No
5. ❑ Don't Know

25. **What type and quantity of high efficiency equipment did you install on your own?** *PROBE TO GET EXACT TYPE AND QUANTITY AND LOCATION*

Type 1: ____________________ Quantity 1: ______ Location 1:____________
Type 2: ____________________ Quantity 2: ______ Location 2:____________
Type 3: ____________________ Quantity 3: ______ Location 3:____________
Type 4: ____________________ Quantity 4: ______ Location 4:____________

26. *For each type listed in 23 above,* **How do you know that this equipment is high efficiency? For example, was it Energy Star rated?**

Type 1: ____
Type 2: ____
Type 3: ____
Type 4: ____

I'm going to read a statement about this equipment that you purchased on your own. On a scale from 1-10, with 0 indicating that you strongly disagree, and 10 indicating that you strongly agree, please rate the following statement.

27. **My experience with the Smart Saver Program in** <2008, 2009> **influenced my decision to install different types of high efficiency equipment on my own.**

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

28. **What other actions, if any, have you taken in your company to save energy and reduce utility bills as a result of what you learned in this program?**

Response:1 ____

Response:2 ____

Response:3 ____

Response:4 ____

Now I am going to ask you some general satisfaction statements. On a scale from 1-10, with 0 indicating that you strongly disagree, and 10 indicating that you strongly agree, please rate the following statements.

29. The rebate form was easy to understand and complete.

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved**?______________________________

____

30. The interactions and communications I had with Duke Energy staff was satisfactory.

1 2 3 4 5 6 7 8 9 10

❑ Not applicable

If 7 or less, **How could this be improved**?______________________________

____

31. The rebate levels provided by the program

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved**?______________________________________

____

32. The time it took for you to receive your rebate

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved**?______________________________________

____

33. The number and kind of technologies covered in the program

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved**?______________________________________

____

34. The information you were provided explaining the program

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved**?______________________________________

____

35. **Overall I am satisfied with the program**.

1 2 3 4 5 6 7 8 9 10

❑ Don't Know

If 7 or less, **How could this be improved**?_______________________________________

____

36. **What additional services would you like the program to provide that it does not now provide?**

Response: ____

____

37. **Are there any other things that you would like to see changed about the program?**

Response: ____

38. **What do you think can be done to increase people's interest in participating in the Smart Saver Program?**

Response:1 ____
Response:2 ____
Response:3 ____
Response:4 ____

39. **What do you like most about this program?**

Response: ____

40. **What do you like least about this program?**

Response: ____

Appendix C: Program Manager Interview Protocol

Name: ____

Title: ____

Position description and general responsibilities:

____

____

____

We are conducting this interview to obtain your opinions about and experiences with the Smart Saver Prescriptive program. We'll talk about the Smart Saver Program and its objectives, your thoughts on improving the program, and the technologies the program covers. The interview will take about one to two hours to complete. May we begin?

Program Objectives

1. In your own words, please describe the Smart Saver Program's current objectives. How have these changed over time?

2. In your opinion, which objectives do you think are best being met or will be met?

3. Are there any program objectives that are not being addressed or not being addressed as well as possible or that you think should have more attention focused on them? If yes, which ones? How should these objectives be addressed? What should be changed?

4. What market information, research or market assessments are you using to determine the best target markets and program opportunities, market barriers, delivery mechanisms and program approach?

5. In your opinion, should the program objectives be changed in any way due to technology-based, market-based, or management based conditions? What objectives would you change? What operational changes would you put into place, and how would it affect the results of the program?

Operational Efficiency

6. Please describe your role and scope of responsibility in detail. What is it that you are responsible for as it relates to this program?

7. Please review with us how the Smart Saver operates relative to your duties, that is, please walk us through the processes and procedures and key events that allow you to currently fulfill your duties.

8. Have any recent changes been made to your duties? If so, please tell us what changes were made and why they were made. What are the results of the change? Do you feel that you were adequately prepared for these changes?

9. Describe the evolution of the Smart Saver Program. How has the program changed since it was it first started?

10. Describe your participant tracking and data quality control process.

11. Do you have suggestions for improvements to the program that would increase participation rates or interest levels?

12. Do you have suggestions for improving or increasing energy impacts?

13. Thinking about how your program enrolls participants, what do you think is the level of freeridership for the Smart Saver Prescriptive Program? (*That is, what percent of the measures rebated through the program would have been purchased and installed without the program's incentive?*)

14. What do you think can be done to lower the level of freeridership?

15. What do you think the level of spillover is for the Smart Saver Program? *(That is, what percent of the high efficiency measures that are installed are, in some way, a result of the program's influence other than direct program participation?)*

16. What do you think can be done to increase the level of spillover?

17. Are you aware of projects moving forward with incentives when they shouldn't be eligible? (If yes…) Why were these projects approved? What can be done to stop this from happening?

18. Do you have suggestion for the making the program operate more smoothly or effectively?

Program Design & Implementation

19. *(If not captured earlier)* Please explain how the interactions between the contractors, customers, and Smart Saver's management team work. Do you think these interactions or means of communication should be changed in any way? If so, how and why?

20. How do you determine what measures to include in the program and what levels of energy efficiency should be covered?

21. Should this be changed in any way?

22. How do you determine what the technology incentive levels should be?

23. Should this be changed in any way?

24. Are there things that you think can be done to make more trade allies interested in participating in the program and focus more on pushing high efficiency products to their customers?

25. Are key industry experts, trade professionals or peers used for assessing what the technologies or models should be included in the program? If so, how does this work?

26. Are key industry experts and trade professionals used in other advisory roles? If so how does this work and what kinds of support is obtained?

27. Describe Smart Saver's contractor program orientation training and development approach. Are contractors getting adequate program training and program information? What can be done that could help improve contractor effectiveness? Can we obtain training materials that are being used?

28. In your opinion, did the incentives cover enough different kinds of energy efficient products?

1. ❑ Yes 2. ❑ No 99. ❑ DK/NS

If no, 20b. What other products or equipment should be included?

29. How do you make sure that the best information and practices are being used in Smart Saver operations?

30. What market information, research or market assessments are you using to determine the best target markets or market segments on which to focus?

31. What market information, research or market assessments are you using to identify market barriers, and develop more effective delivery mechanisms?

32. Overall, what about the Smart Saver program works well and why?

33. What doesn't work well and why? Do you think this discourages participation or contractor interests?

34. Can you identify any market, operational or technical barriers that impede a more efficient program operation?

35. In what ways can these operations or operational efficiencies be improved?

36. In what ways can the program attract more participants?

37. *(If not collected above)* What market information, research or market assessments are you using to determine the best target markets and program opportunities, market barriers, delivery mechanisms and program approach?

38. If you could change anything about the Smart Saver Program, what would you change and why?

39. Are there any other issues or topics you think we should know about and discuss for this evaluation?

The Non-Residential Smart $aver® Marketing Approach: Smart Building Advantage

Prepared for Duke Energy Corporation

526 South Church Street
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March 1, 2011

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The Focus of this Evaluation

This evaluation is the first of a three-part assessment of the Non-Residential Smart $aver® marketing approach known as Smart Building Advantage (SBA). The purpose of this marketing approach is to attract new customers to the Non-Residential Smart $aver® Prescriptive and Custom programs. In this (first) assessment, the evaluation looks at the reasons for engagement, the value proposition for the prospective participating customers, and the ways in which the Duke Energy's existing programs are meeting the needs of these early participants. The second evaluation will examine the SBA's approach after participants have had enough experience with Duke Energy and have implemented the recommended strategies through Duke's existing programs. This second study will assess the SBA's execution as well as the prospective participants' experience with Non-Residential Smart $aver®, the recommended actions, and the savings that they are experiencing. The third evaluation, to be completed and reported at the same time as the second study, examines the energy impacts that have been achieved by the participants as a result of their participation in Non-Residential Smart $aver.

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Executive Summary

The approach examined in this study is a marketing strategy for Duke Energy’s existing Non-Residential Smart $aver programs and internally referred to as Smart Building Advantage (“SBA”). Survey results show participants like SBA. Prospective Non-Residential Smart $aver participants in this study view this initiative as a service that helps them control their electric consumption and the associated costs and as a way to gain needed experience with the equipment and strategies that will help them make the adjustment to an hourly energy price and supply situations. Prospective Non-Residential Smart $aver participants also view this marketing approach as a way to become better prepared for managing the energy future of their companies. The SBA marketing approach provides participants with an educational and strategic capacity building exercise.

This initiative is also mission-friendly for these key-account customers. All of the interviewed participants expressed a corporate objective focused on moving or continuing to move toward a greener operational platform. However, cost control within their businesses is important and is their key focus. SBA helps customers utilize Non-Residential Smart $aver to achieve both directives. The technical assessment portion of this marketing approach is conducted by a nationally recognized energy management expert and does not represent any brand or equipment trademark. This approach is a key benefit of SBA's design because it helps build trust in the survey’s recommendations and aids key decision-makers in the belief that expected savings are real and likely to materialize. Linking the SBA approach to any single equipment supplier or type of brand equipment or communications platform will harm this trust.

Non Residential Smart $aver with SBA also strengthens key account customer relationships with Duke Energy and helps move Duke Energy to a position of being a valued trade partner rather than just an energy supplier. Participants in Non Residential Smart $aver report that they would not have made the degree of improvements that they are making without establishing trust in the results of the energy analysis. Participants must be able to trust that Duke Energy is placing their needs above other concerns, and they must be able to rely on the financial support Duke Energy's Non-Residential programs provide. These conditions allowed participants to move forward with their projects. All participants value the educational experience they have gained as a result of their participation, but particularly value the knowledge gained regarding building energy management approaches and their integration with operations in a way that is not disruptive to their operations.

All of the key-account commercial participants, regardless of their position or level of responsibility, view \Non Residential Smart $aver with SBA as a good thing for them personally and for their company, and look forward to replicating this experience in the future, if the projected savings are obtained.

Managers additionally report that SBA is set up to synchronize with their management and decision systems to a large degree, but also suggest more attention is needed on this aspect of SBA. Participants in this marketing approach report that Duke Energy and their contractors through the Non Residential Smart $aver program are thorough, responsive, courteous, and focused on creating a win-win participation experience. However, participants noted that their operational decision systems are set up to operate on a schedule beyond a Duke Energy designed participation window. Some participants referred to a multi-year planning horizon for key corporate decisions of the magnitude of SBA's recommendations and their associated costs. Participants agreed that longer term planning is important for integrating higher cost retrofits into their corporate planning cycles. In multiple cases, the participants were able to move the decision process up the corporate ladder faster than what is typical, but also noted that these are special case test circumstances. Participants noted that capital equipment upgrades of the magnitude recommended by SBA will require integration within their longer term financial plans and approval processes. This means that Duke Energy's SBA and program managers will need to plan for these longer cycles within their operational designs as they consider moving SBA from a initial phase to an operational phase. Several of the participants suggested working together to create 2, 3, 4, and 5 year plans for equipment upgrades. However, these participants also want to make sure that the projected energy savings are real before they move too far. The future success of the SBA, especially for these early participants, rests on the amount of and speed of the savings projected.

Participants view SBA as a good way to test the Smart Grid waters, with Duke Energy as a partner to help. These large key account customers are not sure what Smart Grid is, how it will work, or what it means to their cost of business. An energy management approach that might erode profits or increase costs is not an option for these customers. These participants see risks with Smart Grid; however, they are not sure of what those risks are, or the size of the risks. None of the participants expressed a desire for a "wait and see" strategy. That is, they do not want to wait until they are harmed, and they want to make sure that they have the ability to manage their risk and to avoid being harmed by lack of preparedness. All participants noted that having Duke Energy as a business partner in this endeavor is critical to their perceived ability to not only effectively manage risks, but to help them place themselves in a position of being able to control the decisions that help them capitalize on Smart Grid. Participation is an energy management and building control strategy.

All participants, in different ways, noted the ability of the marketing approach in SBA to help them become more competitive or place them in a better market position compared to other firms that do not know how to use energy and energy control systems well. For some customers, environmental performance is important because it may impact their ability to acquire and keep tenants and customers. These companies want an environmental friendly image that is backed up by performance.

A key consideration in the participation decision was uninterrupted operations. Most interviewees noted that the smooth maintenance of their operations, regardless of what that means, is important. For some customers it meant being able to use the facilities as needed - with flexible use schedules. For others it meant that occupants would not be interrupted or inconvenienced, or that core services would be un-impacted. While all participants understand that there is a need to shut down, remove, reconfigure, or install new equipment and control systems, all interviewees indicated that these must be planned and implemented in a way that eliminates or minimizes disruptions. At the time these interviews were conducted for this evaluation, the participants were pleased with the way the process was performing given this objective. But several reserved the right to make this judgment as the project moves forward.

Participants are almost uniformly cost-conscience. Cost of operations and the return on the investment compared to other internal corporate needs is just as important as purchase price. All participants noted that acquisition costs are a barrier. However, they also noted that the Duke Energy incentive was a critical part of their decision to move forward. In all cases, these projects would not have been done without the Duke Energy incentive and technical assistance which helped overcome hesitation or resistance to making such expensive upgrades. Even the participants who have a full-time engineering staff and who had examined similar types of retrofits and configurations in the past reported that it was the SBA package that allowed them to move forward when they had been unable to in the past. However, the incentive alone was not the key factor for these participants. The engineering analysis and the skills and reputation of the technical team were just as, if not more, important. Participants need to be sure the savings will be there. The future of these types of actions from these participants will depend on the performance of these projects.

For all participants, SBA and their experience with it has strengthened their business relationship with Duke Energy. While Duke Energy was and is a valued business partner for these customers, the experience associated with SBA has made these participants inclined to want to be more closely associated with Duke Energy and they view Duke Energy as a valued strategic business partner.

Summary of the Non-Residential Smart $aver ® Marketing Approach: Smart Building Advantage

The Smart Building Advantage (SBA) Approach is a small initiative that works with a limited number (4 to date) of larger commercial customers to help them control their energy demand and consumption. The SBA works with independent technical experts hired by Duke Energy to examine the equipment and energy control approaches at the customer's location, assess their energy and demand savings potential through the use of advanced real-time hourly energy analysis linked to real time control strategies. SBA also provides Non-Residential Smart $aver incentives to update equipment, the expertise of Duke Energy technical staff to configure equipment, and equipment control strategies that can reduce energy use or demand and save money for their participants. Because of this approach each project is different, and is based on a detailed technical assessment of each building, the equipment in that building, the operation of that equipment, and the use conditions and needs of the facility. Duke Energy uses the results of the technical assessment, in conjunction with a contract with each participant to undertake specific equipment and control strategy changes to reduce demand and energy use. The results of the technical assessment and the individual agreements with each participant specifying the actions they are committing to take are used to calculate the Non-Residential Smart $aver program incentives in a way that causes those actions to be completed. The actions taken are based on the ability to understand hourly energy use and prices, and project forward what energy management strategies are needed to operate the participants' buildings. The control strategies implemented are designed to lower demand or consumption, while still meeting the needs of the building's occupants.

SBA is designed to take advantage of hourly price changes so that the participant is better able to control their energy use and acquire a greater ability to control their energy demand and use costs. At the time of this evaluation, SBA had four large key account commercial participants.

The evaluation results for the first study are presented in the remainder of this document.

Participants' Perception of the SBA Approach

This is a research initiative. As a result, one of the objectives of this evaluation is to better understand how participants value SBA. Understanding the value proposition for these early participants will help identify areas on which SBA designers can focus efforts. It is important that approaches be evaluated in a way that addresses the needs of the customers so that Non-Residential program managers can be successful in delivering on these needs while capturing the needed energy savings. Success for projects as technically focused and as costly as these projects are for the participants, means that in addition to achieving Duke Energy's energy objectives, the project must perform well for the participants. This section of the report presents the results of an assessment of the value proposition for the participating customers.

Because SBA participants consist of four large commercial customers, we are not presenting a quantitative analysis of the value proposition findings. A quantitative analysis of such a small sample would not be informative in a way that can be directly applied to the larger commercial market. However, it is important to understand the value that participants place on different aspects of SBA. In reviewing the responses to the value proposition questions asked of these participants, we have identified 12 key value areas for the four participating commercial customers. These include:

1. Cost savings and return on investments
2. Packaging the program as a complete service
3. Understanding Smart Grid
4. Getting the right people with the right focus
5. Moves customers in a direction they want to go
6. Uses the right equipment and technology
7. Focuses on the customer's needs – not the needs of vendors
8. Brings money to the table
9. Supports the customer's environmental objectives
10. Educates the customer's employees
11. Provides a competitive market advantage
12. Reduces downtime, service issues, and complaints

For confidentiality purposes the names of the participants are removed from these findings.

Cost Savings and Return on Investments

Participation in the Smart Building Advantage marketing approach and the implementation of the energy technology and control strategies needs to be cost effective. Projects through the Non Residential Smart $aver program must produce an acceptable return on the investment for these participants. SBA appears (at this time) to meet this test. However, actual performance will be important. Participants report that performance cannot only be projected, it has to be delivered. Participants reported that they typically must see a payback of less than 3 to 4 years for project consideration.

Project approval has a tougher hurdle. Several of the participants report that any project that cannot pay back within 12-18 months is seen as a higher risk project. These participants note that projects that take more than a couple of years to reach payback are not the projects of choice if other, more profitable, projects are available. These participants report that their energy investment decisions are becoming harder to sell to senior management and new projects will need to perform better than previous projects. All of the participants reported that SBA helped them move their projects from a non-approved status to an approved status by helping to meet their internal investment thresholds and by helping to "sell" the projects up the management chain.

Several managers noted that the rate of return for their project was a primary value contributor and represented a good investment strategy. Managers report that the return on their project investment is better than most other investment opportunities, including new products and service development. The rate of return is a primary driver of the customer's ability to move from the assessment phase to the implementation phase. However, cost saving projects that have a high rate of return do not necessarily get approved. A more important consideration for some participants is the generation of new revenue. "*Everything* [in our firm] *is based on revenue, revenue generation comes first."* However, some participants report that they have more projects to do than revenue to implement them. As a result, projects that produce new income have a higher priority than projects that reduce costs. One key decision maker reported that "*there is a built-in bias that acts to reduce interest in saving money compared to projects that generate new income."* The program's projects for these customers provided enough savings that they could compete for dollars when compared to other demands for investment capital. "*The value in this project was that it provided enough return on the investment from savings that it could be approved."*

Out of pocket price reduction and cost control are important. SBA provides participants with financial assistance, technical assistance, and the implementation assistance to be able to better control costs associated with demand charges and energy consumption. Cost control is a primary participation driver for these participants. For some, a key participation driver is building energy use cost control. For others it is a part of facility operational cost control, their energy budget control, or it's about controlling a global energy use budget. These costs can drive facility relocations into countries or territories that allow the hourly control to achieve the associated end objectives. Regardless of the focus of the cost control consideration, controlling cost is a primary driver of participation. Yet, cost savings are not the end objective for any of the participants. For these participants the end objective is what can be done with the cost savings and how it impacts their position in the market. Cost saving is tool for these participants. That tool allows something else to be accomplished. For these key account participants, it is less about the savings and more about achieving the accomplishments that the savings can provide that is central to their view of success. While this concept may appear rudimentary to some, its importance should not be underestimated. If the savings are achieved, but achieved at a level that does not support the reasons for the participation decision, then the future decisions will be seen as risky and enthusiasm for future replications of the project will be diminished. From this perspective, the participation decision is a financial concept decision on which future actions will be influenced.

Participants are focused on their bottom line and on how revenue can be increased, how profits can be strengthened, and how costs can be controlled. These participants value efficient and cost effective operations and they place a high value on reducing operational costs.

While it is important to understand the cost and investment decisions that play a role in the participation decisions, it is also important to understand the market environment that generates these cost and revenue concerns. All participants report that they operate within a competitive market and that this competition acts to hold costs and prices in check. Participants report that their competitors are looking for ways to extend a lower cost service to their customers. These participants report that predictability in their cost structure is important for maintaining their competitive position. Participants report that SBA helps them keep energy costs in check, allowing more control and predictability in their energy cost structures. Participants report that operational budgets and pricing have to be both synchronized and dependable within their income and expense platforms. More predictability translates to more competitive pricing because they do not have to plan for energy cost risks that act to place upward pressure on pricing.
Participants report that they need strategies to help them keep costs predictable with as low of a cost-risk as possible. Participants are interested in ways that allow them to remove or reduce uncertainty within their budgeting process, which serves as the foundation for their service offerings and operational success. They view SBA as a way to help them keep costs predicable and acquire the advantages in the market that come with cost predictability.

Packaging the Marketing Strategy as a Complete Service

Participants report that the SBA is more than an energy efficiency marketing approach. It is an initiative that brings the entire energy efficiency platform under one roof, with one set of participation hoops. Participants with SBA recognize they can go to the Non Residential Smart $aver program for a wide range of equipment, controls, and information management support. While both energy efficiency and demand response programs are available in other states and within Duke Energy's territory, SBA brings it all together in a way that works cooperatively with the customer. "*It lets us bring our people to the table, with Duke Energy bringing their people, with both sides of the fence having the same goal*."

One of the key attributes in the value proposition for participants is that SBA brings together a set of conditions and services that are of value to customers. Managers report that, "*rebate programs are great, but anyone can do rebates*." What these participants value about SBA is that it brings the services they need together in a single place with a solid implementation and operational support framework. The words that were used to express this benefit were words and phrases such as:

- "*Brought in top notch talent*"

- *"Contributed money"*
- *"Helped us get it done"*
- *"Pulls it all together"*
- *"Takes the full load off of us"*
- *"Brings so many things together"*
- *"Looks forward"*
- *"Builds trust"*, etc.

Managers reported that SBA brings together the whole package of services, linked to funding, tied to professional talent, technical support, and hand-holding that made their experience worthwhile. "*This started at an expert level and built a track record along the way*."

Interviewees like the way SBA operates as a coordinated team with their own managers. SBA is viewed as not just another customer-vendor transaction, but as a structured teaming approach for solving a problem or taking advantage of an opportunity. The partnership with their internal team managers, third-party experts, and Duke Energy managers is an important part of the value proposition for these customers. Participants see SBA as an engagement with an expert team with ongoing support and interaction. "*One of the strengths and the best parts of this is the interaction with the Duke technical team; this needed to happen."* Participants report that Duke Energy has worked with them in an understanding way that is considerate of the decision-making approach that they must use as well as the contracting approach required within multiple layers of internal management and decision-quality case building. *"This was a real partnership. The team approach is good."*

Managers reported that one of the key considerations for their participation was the promise of a longer-term partnership with Duke Energy and the commitment to the success of the project by the Duke Energy team. They reported that Duke Energy will not go away after the installs but will be with them to make sure the project works well. "*We like being the test site and partnering with Duke."* They like that Duke Energy's commitment goes beyond the project participation decision and will provide the help they need, should they need it. They like the personal commitment from Duke Energy's management and engineering teams. They consider the project a true partnership with risks and rewards important to the entire team.

SBA builds trust. All participants indicated that they value their relationship with Duke Energy and consider Duke Energy one of their key business partners. SBA allows participants to team with one of their trusted business allies to explore ways to take advantage of energy pricing and supply opportunities. Participants value being able to rely on the energy expertise of Duke Energy and their contractors. This is the first teaming arrangement of this type with these participants – regardless of who provides their energy across their various locations. Participants report that SBA is building and strengthening their relationship with Duke Energy. However, all participants took a wait-and-see attitude, and reserve their final assessment until they can see proof of results. The success of SBA, as expressed through post-participation corporate networking and experience sharing, will depend on delivered results. The success or lack of success from these projects will impact their relationships with Duke Energy.

Participants also expressed appreciation for one of the key components of the value proposition, which was not used in some cases but nevertheless was a valued item. Managers report that the offers from the Duke Energy team to present the projects to senior management were appreciated and were considered a valued part of their decision making process. Managers reported that primary core service needs take precedent over building energy system needs even when the return gained from the building system improvements are greater than the return expected from their core-mission projects. This means that sales presentations to upper management are important. The availability of the Duke Energy team to help present the case to senior managers, who are not as focused on buildings systems, was of value. "*We were comfortable with Duke's offer to go to our meetings and explain the details of this project to our chain of command.*" "*We operate within a competitive internal decision making process. Infrastructure projects have to compete with core service needs. For these decisions, we are in a month-by-month, week-by-week competitive process.*"

Transparency within the packaging and presentation of SBA is important for trust building. Participants liked the fact that everyone is looking at the same information at the same time, with no hidden agendas that are typical with vendors who want to sell only their services and their equipment. This helped participants build their participation case and supported their decision to participate. Participants had the same information that the Duke Energy managers had at the same time. Duke Energy did not act as an information filter. None of the recommendations were prioritized or sanitized by Duke Energy or run through a preferred vendor filter before they were provided to the participants. The transparency of the process was a valued part of the process for these customers. They felt that they were getting the full story and the complete analysis. This helped build trust in the process, the analysis, and the recommendations. *"The transparency was helpful; we all saw the same information in the same draft documents."*

Participants like the fact that SBA is not so highly defined that technology or management options are limited to a set of pre-qualified measures. They like the way SBA can be tailored to their needs, their buildings, their systems, and their approach for management and decision making. "*The program is not so tightly defined that our options are limited. The program allows us to toss a broad blanket. We are not just fixing a piece of this, but are fixing the system. It allows us to think in broader terms.*" Managers also report that SBA is focusing on the right things. They like the flexibility to reduce both kW and kWh and they like the fact that the technical assessment can look for kW or kWh savings across any of the building systems. "*This approach fits with where we are, we have to lower consumption. We are not being steered into a direction we do not want to go.*" Managers report that *"HVAC and lighting are building operations costs one and two for us, so these are important."* but they like programs that allow them to go beyond these areas.

Understanding Smart Grid

All participants reported a need to obtain Smart Grid experience and expertise. These participants see real time meters and pricing with price signals from their energy supplier becoming the standard practice within the non-residential market. They see their energy suppliers, such as Duke Energy, making these moves. Participants do not want to be caught unprepared. *"We see this program as a bridge to Smart Grid."* They want to be ready to take advantage of real time pricing opportunities, and more importantly, minimize the risks of these changes on their cost of operation. They want to maintain their market focus on being energy smart, using energy to service their customers' needs, while maintaining a low operational budget at the building and corporate levels. These participants see Smart Grid as a potential solutions platform. They see SBA as a bridge to the Smart Grid's operational system. "*We need to get closer to Smart Grid solutions."* For these customers, participation is seen as a test of the monitoring and communications systems and its ability to react to price messages. These advanced supply and pricing approaches need to be understood well so that these participants can use them effectively. However, managers noted that these systems and their operational impacts need to invisible to their customers. Smart Grid systems cannot result in customer complaints or loss of customers within a competitive market.

Smart Grid and time-of-use pricing are growing concerns with possible opportunities for participants. They understand that demand and time-of-use issues will grow in importance and that they have to become experts with time-of-use control strategies and approaches for managing operations to be able to take advantage of Smart Grid. They do not want Smart Grid to control them or negatively influence their operations, performance, comfort, or costs. They want to be able to control energy to be able to take advantage of Smart Grid's capabilities.

These participants view SBA as an "Introduction to Smart Grid". SBA allows participants to gain experience with technologies and control strategies that they would not have tested on their own due to their corporate cost and risk requirements. "*This allowed us to test some things that we would not have tested on our own."* One of the values that interviewees expressed was that SBA is providing participants with experience that is guided by a team of experts brought to the table by Duke Energy. The word "*test*" was used several times by multiple interviewees across various levels of management interviews. These participants are viewing SBA and this participation event as a test case for guiding what they will do in the future.

All of the participants are apprehensive about over-investing in energy efficiency. Managers noted that they will be held accountable for results. While they view Smart Grid and real time pricing with mixed feelings, they see that they need to become experts in responding to price signals and demand costs. Participants report having had "*bad experiences*" dealing with Energy Service Companies (ESCOs). They understand that what is promised is not what is necessarily delivered and they know that a move to Smart Grid will complicate the picture. They also understand energy supply markets are changing fast and that they need to speed up their level of preparedness. They do not want to be caught unprepared. SBA, and this project, helps them "test the waters" a step at a time.

Participants are looking for proof that Smart Grid equipment and control strategies do what they promise. Participants report that they are looking forward to using more integrated technologies and building control systems that communicate with pricing information to achieve the anticipated benefits. These types of project are new for these customers. While they have experience in energy efficiency and with energy efficiency programs and incentive mechanisms, they want to be sure that Smart Grid-type systems deliver. Teaming with Duke Energy allows for a shared cost/shared risk approach in a single package. The assessment and recommendations of Duke Energy's experts, with the support of the participant's key engineering staff or contracted advisors, and the confirmation of the assessment approach and accuracy, helps reduce the investment uncertainty and helped to move these projects forward. These systems carry with them a degree of risk and participants not only need the savings to be there, but also value the Duke Energy team's ability to share the risk with the project's investment. *"The fact that Duke Energy is placing substantial resources into the pot means that Duke Energy is also sure that the savings will be achieved."*

Several of the participants suggested that Smart Grid will help them to continue to be the right-priced high-quality provider in their industry. They feel SBA, this project, and the experience that they are gaining will help them be ready to use Smart Grid to further this mission. "*We want to continue to be the low-cost, high-quality provider in our industry and Smart Grid may help us*." Participants see this project as getting their feet wet, and beginning the process to more aggressively control costs rather than increasing the cost of service. They see a future in which income will be squeezed and where cost-reduction will become a stronger focus for the industry. They see that they will have to become more skilled at acquiring cost reductions from their building systems. "*We need to be the best-in-class, high-quality service provider. I want us to be the benchmark for what this means in our industry."*

Getting the Right People with the Right Focus

The use of a nationally recognized building systems expert (Building Intelligence) was a critical part of the value proposition for these customers. It allowed participants to place trust in the analysis and recommendations, even when some of their own engineers were questioning the project's recommendations. The fact that the analysis and recommendations were conducted by an expert who has impeccable credentials and substantial experience is a critical element of the participation decision, but also for decisions to implement the recommendations. The third party engineer was very important for building the trust needed to support a decision to go forward. *"It is one thing to receive a vendor's recommendations, it is another to have a well known expert provide independent recommendations backed up with documentation. He has a positive reputation."* Managers also commended the recommendations provided by the third party expert. *"Our people said Duke Energy nailed it. We looked at the report and were impressed." "The real value in this was the engineering analysis. The incentive was critical for approval, but the engineering was very important."*

All of the interviewed participants report that having experts like Paul (Building Intelligence) and his team, who can bring SBA to customers for Duke Energy is very important. Other people, who are less skilled and less qualified to conduct the analysis and make the recommendations, will not be as well received. "*The fundamental part of this is WHO has done the analysis. Everything is based on the credibility of that individual and that team. When the credibility is established, then we can look for opportunities. The incentive and the quality of the team together are key.* "*These guys are very knowledgeable; Paul is one of the best I have seen. He looks at all avenues and approaches.*" Participants also like the fact that this team is knowledgeable about their building's equipment, their building control systems and their software. Participants did not want to go through a process of educating a Duke Energy program team. *"It is important that they have the right people doing this, bringing the people to the table who know what they are doing is important."*

Having the right people is important, but just as important is having those people provide the information needed to build trust and make an informed decision. Participants report that the level of detail provided from the assessment was beneficial. Participants felt that they were not obtaining a high-level summary analysis (as some had in the past through other audits) but received the details from the technical and financial analysis. The detail enabled the customer's engineers and financial managers to review and confirm the analysis. It was transparent. This process allowed participants to support the analysis and the resulting recommendations because they were able to confirm that the technical and financial analysis were in agreement. "*There was enough detail. We were able to use them for our approval. The Duke formats were good for our financial analysis. The numbers had credibility, we could use them right then."* According to the interviewed managers, Duke Energy provided the information in a way that worked well for the participants. *"They put it in terms we could use within our department. We were good with the way it was presented."* However, it should be understood that these participants had skilled engineering and financial managers on staff or available via support contracts. As future SBA plans are formed, it may be necessary to plan for participants who do not have the skilled engineering and financial expertise.

Moves Customers in a Direction They Want To Go

These large key account customers plan ahead. They do not wait for markets and conditions to influence them before they become engaged. They see that they need to move to a building management strategy that is more integrated - merging equipment selection, equipment type and equipment use and use conditions within an automated process that lowers cost and increases efficiency of operations. They understand that more advanced system automation is one of several routes for achieving this objective. Participants envision a future in which centralized, corporate-level control of building operations will improve maintenance and operational responsiveness while saving money. They see this move as a streamlining function of their operations and maintenance efforts associated with building and equipment performance. For some of the participants, the planning is at a global scale. These participants look at energy management and cost control as a global opportunity or management strategy. One in which energy costs in one part of the world will need to be stabilized by actions in another part of the world. For others, the opportunities are at a national or regional scale with control strategies tailored for a few energy providers and the markets within these territories. For others, the opportunities are within their local facilities, in which energy opportunities will be focused within those structures. The over-arching moderators for this effort are upfront costs, comparative savings, internal expertise development, impact on operations, and customer satisfaction. SBA takes them down the path that they already know that they want to go when conditions are ripe.

Participants realize that they need to build a more coordinated corporate-level approach to how they specify and select building technologies. These technologies will need to be more integrated in the future, and use standardized communication and control systems across their companies. They realize that their building-specific equipment selection practices of the past have harmed their ability to develop corporate-wide control systems and strategies that are compatible with Smart Grid and future hourly supply decisions. Several participants indicated that their past equipment and control choices have now trapped them into equipment that is not the best choice for their future. Participants report that they have different brands of equipment, controls, and communication systems that do not work as an integrated system. Some key equipment is incapable of communicating within their own facility communications systems. They understand that equipment and control choices go beyond thinking in single equipment terms or in bringing a downed building back up and in service. Participants view SBA and these projects as a method for helping understand how to specify equipment in the future. If this effort proves successful (i.e. delivers an acceptable payback, improves operations and maintenance time and costs, is transparent, and does not decrease customer satisfaction), then the experience will result in modified equipment specifications and acquisition approaches for other buildings. This project essentially becomes an experimental equipment specifications development exercise.

Key managers indicated that their equipment and energy market price communication and control systems are not up set up or performing at the level of where they would like them to perform. They indicated that they need to improve their equipment and energy supply cost communications and response protocols and approaches. SBA provides that help, not just in theory or in theoretical applications, but in real-life equipment that is designed to take advantage of price and supply signals and control approaches. It gives customers a start down a path they already want to go. *"Our energy communications systems are not adequate for us. This program allows our facility to begin the two-way communications with the utilities. It has to be two-way and we have to be able to take advantage of changes in price and opportunities. I like this."*

Participants report a need to increase automation when it can result in reduced labor hours and/or costs. Participants are interested in placing more equipment within an automated monitoring approach for operations and maintenance with the appropriate monitoring-based reporting. They report that SBA and its associated monitoring strategies fit well with their automation objectives. *"We need the building to come to the technician, and not the other way around."*

Uses the Right Equipment and Technology

All participants indicated that SBA has benefits in helping move to the right set of equipment and control strategies and provided a number of comments that focused on equipment and technology selection and operational conditions.

Participants realize that the Smart Grid is coming and that energy may be more expensive and more demand-priced. Some of the managers interviewed envision a world in which carbon will play a more important role in power supply decisions, both internally within their companies, but also externally as the market reacts to environmental issues. Several of these participants have made decisions to operate their buildings more efficiently and to move to technology systems that capture cost reduction and environmental benefits. SBA's focus matches future technology needs and their move toward smarter energy management technologies.

Participants like the way SBA is designed to integrate with what they have, rather than suggesting they convert to new systems, equipment, and approaches. Participants report that they like the way that technologies, system communications, and technology control strategies of SBA can be integrated into their control strategies and equipment. One participant indicated that this is important for them globally as well. That is, the approach must fit within their strategies for energy use and control systems globally. Participants noted the need for a corporate-wide approach for energy equipment and management approaches, with consistency across buildings, states, and countries. SBA's technical approach must fit the customers' equipment and configuration position in this evolving market condition. SBA's objectives for how technologies should be integrated and controlled must match those of the participants.

Participants report that they need the real-time feedback and that they need the information to demonstrate to corporate management that these systems and technologies work. This trust is required before a move to standardized equipment and control approaches will gain full support. They need to demonstrate success with the approach. "*We need the feedback; we have to show our leadership the savings and results. This is as important as the project itself. If we can get the feedback, and demonstrate the savings, we can replicate this project and these control strategies and technologies in our buildings."* This project will help participants get there if it performs well and they can demonstrate performance to their management.

Some interviewees reported that their standard approach for solving energy equipment problems is to repair the equipment and keep it in service, even in cases where upgrading would lower total cost. They report that their process focuses on repair as the first option of choice, followed by component replacement, rather than developing an integrated building-level solution. Internal competition for capital is one of the primary drivers for this policy. SBA has allowed these managers to focus more on a systems integration approach when possible and profitable by demonstrating that it is better to address system-level needs rather than only focus on individual equipment operation. "*We had a component replacement or repair approach and this project demonstrated a 'fix it right'* *approach; we went from a tree view to a forest view."* In this case the engineering team was ready for the move to an integrated approach before the senior financial management team was convinced of the desirability of this move. In this case SBA was able to provide some confirmation of an equipment and control direction that had been suggested by the engineering team. SBA helped them confirm to senior management that they were on the right equipment and control approach path.

In the past these participants have had private engineering teams come in and audit or assess their equipment and operations. Some report that they have been disappointed with the results. Managers reported that these teams have focused on selling only what they carry, pushing only their equipment and their control systems. They did not focus on what equipment and control and monitoring approaches would work best for the participants. These interviewees noted that other private audit teams have created as many problems as they have solved because of their narrow focus. "*We have had a lot of projects. Some did not work, some created more issues, and sometimes their engineering drove our operations* [instead of the other way around]." Participants reported that the Duke Energy team came in with a different attitude, a different focus, and different priorities. *"In this project they focused on our needs, our operations, and made the engineering fit our systems. They kept our people happy with the energy results* [operationally], *and we save money."*

One strategy common to these participants is the need to reduce costs through more advanced technologies and control systems and building better buildings. They see the move to energy savings via technology and communication systems integration as the right approach that balances the cost control and financial health motives with other corporate responsibilities.

Brings Money to the Table

The ability of SBA to provide an incentive was a critical factor in all participants' decisions to participate in SBA. SBA and the Duke Energy program incentives and the financial support for the analysis was a critical factor for participants. Participants liked that the financial risk was shared. *"They had a stake in the game."* The decision to go forward was strongly influenced by SBA and the program incentives, especially for the phase one analysis and recommendations. Some participants were able to acquire additional incentives, including one participant who was able to acquire an ARRA incentive from the state. "*Our phase one decision was made because of the Duke incentive. It brought the project in below our cost threshold, a critical level in our decision process. We have a different* [more restrictive] *approval proces*s [than other corporations].

Without the incentives from Duke Energy's Non-Residential programs, SBA cannot get to first base with these customers. At this time in the Smart Grid market development cycle, these customers are hesitant to launch these types of initiatives without utility incentives or other risk sharing support. Participants report that they would continue to do lower-cost, less comprehensive projects without financial help to offset risks and move the return on the investment to fit within corporate needs. The incentive is key to the participation and implementation decisions of these customers.

Participants report that the economy is down and capital is tight. These two conditions mean that customers must be even more financially prudent when compared to periods when the economy is stronger. Participants report that they need to stretch each dollar and obtain more productivity per dollar while reducing recoverable costs. These participants report that SBA is helping them achieve more of their energy expense related goals while saving money via SBA and the Non-Residential program's incentive system. *"Duke's financing is important. We would not be doing this without the program's financial help."*

All participants indicated that Duke Energy's program incentives and SBA allow them to obtain higher cost but more efficient equipment and control systems at a lower price. For all participants, the project is considered a cost-saving project. Several participants reported that the upfront costs without the incentives were beyond their current reach and spend policies.

Supports the Customer's Environmental Objectives

These participants do not see profits and environmental responsibility as separate or incompatible concepts. Rather they see environmental stewardship as a part of the way in which profits are enhanced or costs are controlled or reduced. Several of the interviewees noted that having a strong environmental focus is central to their corporate mission and has a direct impact on their ability to competitively function in the market.

All participants report that they are concerned about their environmental image and want to move in a "green" direction. However, the level of concern is not consistent across the participants. While all participants indicated a need to continue to move in a green direction, some are more focused on this objective. One of these participants has a mission to be the best environmentally performing company in their line of business. Others want to make sure they are focused on environmental performance to the extent that is appropriate, but still indicated that having a green image is important. Even the participants that do not have a formal environmental mission operate as if they did. Most participants indicated that they want to be a leader in minimizing their carbon and environmental footprint. SBA helps achieve that objective and saves money at the same time. Managers report that *"for each kWh saved we can reduce the need for one pound of fossil fuels." We want to give back to* [our] *clients, the environment, and to the community. This is our corporate view."* Participants want to be seen as being green, and they are not sure if they are green enough. "*We are not sure that we are green enough. Are we also helping Duke reach their energy and environmental goals? We need to be doing the right thing."*

Several participants indicated that they have an organizational commitment for achieving environmentally friendly facilities. Participants report that environmental performance is critically important for being able to attract more environmentally aware clients and customers. Organizations that do not show an environmental focus linked to matching performance will have a harder time attracting clients and customers. Incentives and energy services, like those provided in SBA, help move these participants toward being able to show/market/take credit for more environmentally friendly buildings. The "ouch" factor (as one interviewee put it) is the building that is close to being where we want it, but not yet there in the eyes of their clients and customers.

Educates the Customer's Employees

The educational aspects of SBA are as important as the energy and cost savings for some participants, and for others more important. According to interviewees, SBA is a good start on their Smart Grid educational objectives. However, several participants report that they would have preferred additional time and exposure with SBA's technical assessment team. These participants want to learn the assessment and energy management skills and become more informed energy experts for their organization. These participants value the transfer of energy management information to their staff as a key reason for their decision to participate. Exposure to SBA's technical team, the consulting engineers, and the ability to learn from them is important. For customers wanting to participate in order to build internal expertise, exposure to and working with the technical team is a primary benefit of their participation decision. "*This program provides ideas on what to do and how to do it. It lets us know what we should be doing."*

All of the interviewed participants view this project as an educational opportunity. Most managers reported learning from the process. Engineering staff learned new methods, systems, controls, and processes. "*We had already considered many of these types of things, but they took it to a whole new level."* Oversight and coordination staff learned about potential and how to gain opportunities. "*The team was excellent. They showed us what could be done."* Financing staff learned what could be achieved from a buildings systems project compared to other investments. "*Have you seen the return on this project? 58% return on the investment at 12% interest?"* Customers place high value in SBA's ability to educate participants about what is possible as well as what works within a Smart Grid approach.

Participants report that they want to do the types of things recommended by SBA but do not have the staff or all of the skills to do this internally. Time and staff are limited, and SBA expands the capability of the participant's O&M teams by providing skilled people to assist in helping participants accomplish their environmental and energy goals. "*Duke's external high quality team is good support for us. It adds resources that we do not have ourselves. We have good ideas, but may not have the time or resources to act on them. This also brings an outside source that brings credibility to the table."*

Provides a Competitive Market Advantage

According to participants, one of the most important driving factors in why customers value SBA is "*market advantage*". Participants want to be seen and perform as the best business within their competitive environments. Customers see SBA as a way to help them stay competitive. "*If we can save a dollar on energy costs that does not need to be passed on* [to our customers]*, then we are a dollar more competitive in the market."* Participants view their SBA/program-induced savings as a future cost hedge strategy that can be used strategically under a set of choice conditions (price vs. need). These managers see a future of higher energy costs that requires a systems approach to make cost-based choices. These managers also forecast increased costs as a result of Smart Grid unless they are actively able to control demand and consumption. That is, the businesses that are able to respond will acquire the savings, with the cost being passed on to those who cannot respond. Businesses that best capture cost control opportunities will have a competitive advantage in the market over those who do not. Being the first to reliably and cost effectively acquire these advantages is seen as strategic market hedge strategy against rising costs and tighter margins for their firms.

Reduces Downtime, Service Issues, and Complaints

All managers report that they like this project because it is not expected to slow, harm, or negatively impact operations. Managers report that it is important for the technologies and control system to not impact building use or operations. Changes have to be invisible to the users and not negatively impact how these facilities are used. Energy use is a way to provide a better operational environment for the functions being accomplished within these buildings. Energy systems are supportive to the operations which have to come first. "*Clients and users should not know the difference – it should not impact clients and use."*

Controlling maintenance costs and equipment downtime are important for these participants. One of the reasons for participation for a number of the participants was to be able to reduce the operations and maintenance efforts for their staff engineers, and reduce the amount of equipment or facility down time. Each participant represented a different market. These include an advanced educational institution, a large national medical services organization, a large national commercial real-estate firm, and a global electronic and communications corporation. Being able to reduce or better control building-related service interruptions is important for each of the participants. Participants have to be able to use their facilities when and how they are needed and downtime that impacts operations has to be avoided. These participants report that they will have better control over their O&M function and should be able to reduce the amount of interruptions caused by equipment performance issues.

Why Customers Participated in Smart Building Advantage

The individuals most responsible for making the participation decision were asked why they made the decision to participate in SBA. Participants were given a series of reasons and asked to score the importance of each of the reasons in their decision or indicate if it was not a decision. They were also asked about "other" reasons that were not on the interview instrument. The table below provides the responses to these questions. The scores associated with each reason are provided, including the average score, the lowest score, the highest score, and the total number of individuals who indicated that this item was a reason for their participation. In addition we have calculated an overall score for the priority of the reason across all respondents. The priority score is the average score multiplied by the number of participants scoring that reason. Lastly, we grouped the reasons into priority categories to indicate if that reason is a very important reason, important, somewhat important or less important. These category groupings are subjective, and individuals may agree or disagree with the priority label provided.

Key managers report that there were four reasons that we have classified as very important reasons for participation. These reasons focus on financial returns, educational reasons, and risk reduction reasons. It is interesting to note that while financial returns are the most important reason using this scaling system, educational and risk reduction reasons rate in the top importance grouping as well. These findings quantitatively support the interview results suggesting that while financial reasons are important, educational objectives are also critically important and a primary driver for participation. In this "educational" response, the educational aspects focus on equipment selection to achieve the greatest energy savings. Likewise, the reasons associated with risk reduction also support this conclusion. That is, participants elected to participate because they do not think that they are experts in these types of decisions on their own, and need SBA's support to reduce the risks associated with making a technology choice or application decision. Participation is seen as a risky decision, involving technology and technology control systems for which they need to build their level of expertise. As a result of these scores, we conclude that SBA is structured to meet the most important objectives of the participants. However, the focus on educating the participants should not be underestimated in its importance. Participants are looking for an education and to build their expertise. This finding is supported by the things that participants report they would like to see improved that are presented later in this report, particularly the educational aspects of the interaction with the building assessment team.

Reason for Participating	Average Importance	Lowest Rating	Highest Rating	N	Priority Score	Priority Category
Maximize the return on the operational investments	8.8	8	10	6	53	Very important
Learn which equipment changes have greatest impact	8.5	5	10	6	51	Very important

Understand and or document achieved savings	8.3	5	10	6	50	Very important
Reduce operational or financial risks	7.1	3	10	7	50	Very important
Reduce energy costs	9	7	10	5	45	important
Gain experience with Smart Grid	8.8	7	10	5	44	important
Learn about best practices in energy management	8.6	8	10	5	43	important
Upgrade our equipment	8.2	7	9	5	41	important
Reduce equipment down time and maintenance time	6.8	1	10	6	41	important
Increase profits	9	8	10	4	36	Somewhat important
Improve satisfaction from facility users and customers	7.2	5	8	5	36	Somewhat important
Improve building use comfort	6.2	5	9	5	31	Somewhat important
Be able to understand behavior-related energy savings potential	7.5	4	10	4	30	Somewhat important
Improve worker or employee efficiency	7.3	6	8	4	29	Less important
Reduce staff or save on employee costs	5.8	3	8	5	29	Less important
Helps grow the business	9.3	8	10	3	28	Less important
Meet green, sustainability, or carbon reduction goals	9.3	8	10	3	28	Less important
Move to a single contact point or energy associated services	8.7	7	10	3	26	Less important
Focus more on our core business and less on energy management	7.7	7	9	3	23	Less important
Attract new tenants and customers	5.3	3	10	4	21	Important
Benchmark similar building types	8.5	8	9	2	17	Much Less Important

Reasons for participation that we labeled as "important reasons" focus on similar aspects of the very important reasons, but with somewhat different perspectives. Important reasons include reducing energy costs, a reason that is strongly related to the most important reason (return on the investment). Likewise, two other important reasons focus on SBA's educational aspects, including gaining experience with Smart Grid and learning about best practice energy management approaches. Two other important reason include the ability to use SBA to upgrade equipment, and to move toward approaches that reduce equipment downtime and time spent on equipment maintenance efforts. These findings support the focus on monetary benefits and education as critical SBA deliverables, but expand into the areas of building operations, with a focus on equipment selection and operational and maintenance aspects.

Participation reasons that we labeled as somewhat important include the increase of profits, a reason strongly linked to the other financial reasons noted above. But equally important within this category is the desire to improve levels of satisfaction from facility users and customers. These were especially important for the university and real-estate participants but less important for the other participants. Comfort also entered the picture at this level of importance, with a need to improve or maintain user comfort levels. Also entering the participation reason at the somewhat important level is the need to understand behavior-related energy savings potential. This metric is not the savings potential from the equipment change-outs that are being made, but the savings that can be achieved via that equipment by modifying the behaviors associated with the people using the facilities.

Of less importance for the participation decision are aspects that deal with ancillary issues to those reported above. That is, the participants see these reasons as being connected with the project, but have less importance in their decision to participate. These include objectives related to employee productivity, reducing staff costs, growing the business, and meeting green-type objectives such as reducing carbon or having more sustainable buildings. Again, these are average scores. One participant, for example, indicated that their senior management wants their company to be seen as the most environmentally friendly firm in their line of business, while another firm has a very limited focus on being an environmental leader within their field. Of less importance to the participants was a need to move to a single point of contact for their energy equipment and associated operations, being able to focus more of their time on their core business and less on building equipment and operations, or attracting more customers and tenants (although attracting tenants was important for one of the participants).

What Participants Like About SBA and Participants' Recommended Changes

The next two sections of this report provide information on what participants like about SBA and what design and operational changes they recommend. The information covered in these two sections of the report is presented in a way that may or may not reflect the priorities of both participant likes or their changes recommended in a quantitative way. This is because the responses were open-ended, allowing participants to identify both the topic and provide comments about that topic. Because of the small number of participants, the presentation is structured to reflect the number of comments received for each of the key topic areas associated with their likes or their recommended changes. The topics covered first are those for which several participants identified it as a "like" or an issue that needs to be addressed for possible design or operational changes to SBA.

What Participants Like About SBA

Participants like SBA. Participants identified a wide range of "likes" about SBA. These are presented below.

The incentives capture the participant's attention

While the technical assessment is important for identifying what can be done, it is the incentives that move the decision forward. These participants have all experienced a building audit with recommendations to improve energy efficiency. However, without the financial incentive, low priority is placed on implementation. The technical assessment identifies what can be done, but the incentive closes the deal and moves the project forward. The incentive level drives participant interest and is the key factor in determining what can be or will be accomplished.

Experts promise savings

Participants like the way the savings are promised by national experts who understand buildings, building operations, and equipment performance. Promises of savings from private contractors or equipment suppliers have little impact compared to the promise of savings made by SBA's experts who gain no benefit from sales of equipment or the level of savings achieved. They have credibility, and the savings estimates are trusted. Participants like the fact that they can believe the savings projected. This approach leads to belief in the promise of a financial return that meets the investment needs of the participants. Participants like the fact that they can have trust in the projections of cost, benefits, and financial returns.

Expands what they can do and allows they to do it sooner

Participants indicated that they like the way SBA allows them to implement more improvements than they can do on their own and, at the same time, allows them to be completed sooner. Both the technical assessment and the Duke Energy incentives are the primary drivers of the expansion of actions taken and the accelerated timing of when they would, if ever, accomplish those upgrades on their own.

Participants like the fact that SBA is flexible and does not focus on a single set of pre-approved actions, but can be innovative and focus on what makes sense for their buildings, equipment, operations, and financial resources. They also like the way SBA can expand or contract its focus on what can be done to match the resources that participants can provide at a specific point in time. This flexibility is important because final decisions cannot be made until after the final technical designs and incentive amounts are fixed to a specific set of projected financial and operational benefits. SBA allows them to understand costs, contributions, and benefits before they fully commit to what can be done. Participants like the flexibility and adoptability during the assessment period.

The educational benefits

All participants like the educational benefits of SBA. They identified SBA as an initiative that moves into new territory and makes systems-based changes that are also focused on future supply and supply cost. This is an area of concern for these participants. They do not think that they are ready for all of the changes that will be associated with a move toward hourly supply decisions. Participants view SBA as an important part of their learning about moving to an hourly supply and building systems based approach to managing and acquiring energy supplies. Participants report that SBA expands their vision of what is possible and gives them hands-on experience. It helps them understand what approaches they need to develop and what skills and knowledge they need to acquire. Participants view their participation as being equivalent to a Smart Grid preparation course, with real equipment, investments, savings, and benefits.

The way SBA is focused on recommendations to reduce both kW and kWh
Participants like that SBA covers energy efficiency as well as demand reduction approaches to increase savings. They like that SBA is not focused on a set of pre-approved equipment or ways to reduce demand or consumption. They like that the analysis is free to explore any possible approaches to reducing energy costs. Participants are focused on cost reduction and the ways that they can achieve savings and do not want to be forced to only examine kW or kWh. They like the flexibility of the focus and they like the ability to focus on the customer's conditions and needs without restrictions limiting equipment choice or operational approach. Participants report that because it is flexible and focused on both kWh and kW, they can take advantage of SBA as an integrated solutions-based initiative focused on the best technologies and approaches.

Quantitative nature of SBA with objective feedback
The quantitative nature of SBA is a key "like" of the participants. Participants want to know what is going on with their equipment and their use. They like the level of monitoring and the feedback information that is being incorporated into their projects. Performance tracking is important for these participants. They want real-time information to determine if their project is working and providing the benefits. They do not want to wait a week or even a few days to learn if they are doing the right things at the right time.

Duke Energy's responsiveness
Participants like the way Duke Energy has teamed with them as a project partner and has established communications and relationship approaches between the Duke Energy team and the participant's key leads. They like that the participation process has been customer-focused and that Duke Energy has supported their needs, timelines, and decision processes. Participants report that the participation process is smooth and is generally problem-free. However, they also provide a number of recommendations to improve SBA. These are presented in the next section of this report.

The application process
Participants report that the application process was generally easy and that Duke Energy made that process as smooth as possible for a start-up project that has a great deal of equipment and performance specificity. This application and contracting process was a multi-step process for these participants of which final participation was dependant on the contracting language and conditions. While participants provided recommendations for improving that process (see next section of this report) they are satisfied with that process and noted that the Duke Energy team worked with them in a way that was sensitive to the customer's timelines and needs. They also report that SBA participation has been trouble free thus far.

Skilled knowledgeable professional team

Participants not only liked, but significantly value the expert technical team that Duke Energy brought to SBA. All participants indicated that they liked the skills and the expert level of knowledge and experience of the technical experts on the SBA team. All participants reported that they enjoyed and valued working with the technical team. Participants considered this team one of the best if not the best in the country for helping to configure their projects and for estimating the savings. Participants reported that this team had a large impact on their decisions to move forward. Trust was established with the technical team, which led to contracted projects.

High quality assessment and management interaction support
Related to the quality of the technical team was the quality of the assessment and the way in which that assessment was brought to the participants. Participants reported that the Duke Energy team provided a very high quality technical assessment, but also worked with the participant's management to convey the information in way that senior management could understand. The technical assessment and the team interaction, working with senior management in a way that captured management's trust, convinced key decision makers that the savings would be real and will be obtained.

Ongoing communication
Participants also like the ability to have repeated and ongoing communications with the Duke Energy SBA team. Some participants reported that they needed to rely on the Duke Energy SBA team several times over the enrollment, contracting, and early participation processes, while others were able to work with the team as needed. In all cases, participants indicated that the liked having that communication and the ability to contact and be contacted by the Duke Energy team as needed. However, participants provided recommendations for improving the level and content of the communications efforts. These are presented in the next section of this report.

Changes Recommended by Participants

Participants also identified a number of things that they would like to see changed. These are presented below.

Improving the interaction between Duke Energy and the participant
All participants indicated that the interactions between the Duke Energy team and the participant could be improved, and all participants provided recommendations for changes. These recommendations are presented below.

Speed up the decision making process at Duke
The majority of the participants reported that there is a need to speed up the process for setting the incentive and communicating the incentive structure to the participant as soon as the technical recommendations are developed. Participants want clear and fast information on what incentives they can expect with the recommendations made. Participants want to be able to assess the recommendations from the perspective of knowing how much it will cost and what the incentive will be.

Give bidders the project specifications early and allow time for bid preparation
A few participants recommended setting an RFP and bidding timeline that allows bidders to have full project specifications in time to provide a detailed bid based on a full understanding of the facility, the equipment, and the operational systems that need to be employed.

Work within each of the participant's corporate planning approaches
Most participants indicated that they must develop projects and move these projects through their corporate planning and approval process. These processes take from several months to several years to complete. Participants recommend that Duke Energy and the technical team spend some time learning about the participants' approval processes and timelines and then develop SBA processes, timelines, and procedures tailored to those processes. Most of the participants indicated that they had to fast-track the projects in some way by moving outside of their normal project development and approval system. This condition is seen as one that lowers the chances of project approval because it sets the project up as an anomaly which attracts more attention from senior management. Participants would like to see SBA become embedded within their investment decision approaches and become structured to operate over a one, two, three or more year planning process as needed by the individual participant. This means for some participants, the SBA team would need to begin planning for a project that would not be funded for a few years. However, these participants also know that the initiative needed to get projects up and running fast in order to test the SBA concept.

Move to a multi-year, multi-project approach
Participants report that because their decision system often cover several years of planning, Duke Energy should structure SBA so that there are multi-year projects and phased-in approaches within each participants' projects. Participants report that while they needed to plan for a single project for a specific implementation period, a full project should have the ability to team over a longer period of time, with project phases designed to match participant's budgeting and approval process. This type of process would match the project phase across multiple buildings and locations with a coordinated annual implementation process for not just one project, but for as many as the participants would like to plan for.

Make the incentive calculation process transparent
Participants reported that they wanted to know how the incentive calculation process works so that they can begin to estimate their own incentives based on SBA's calculation rules and procedures. All participants reported the incentive calculation process was not explained well enough for them to understand how it works.

Smart Grid and Participation

Participants are not yet sure what the term "Smart Grid" means. But they know it means an energy supply system that is moving toward hourly-based pricing with greater ability for both the energy supplier and the energy consumer to have a greater real-time understanding of their energy use. Participants understand that the Smart Grid promises the ability to be able to take advantage of rapidly changing energy supply and price conditions. All participants reported that one of the key reasons for their participation was to help move their organizations to a monitoring environment in which they can make consumption decisions based on what is best for them or their customers. These participants view SBA as one of the key tools they have to help them move to a real-time price and supply decision framework that can be managed to meet their needs. They view SBA participation as both a defense and a strategic energy management issue. They want to be able to defend against rising prices or peak pricing conditions so that they are not financially harmed. At the same time, the want to be able to control their energy use relative to real-time pricing. "*This will help us reduce costs and supports our efforts to control costs within a Smart Grid approach.*" However, they want that control in a way that when exercised, does not harm them or their customers. All customers reported that they are under higher pressure financial environments than they have been in the past, and have to be able to control energy costs. These participants do not view energy cost control as an option, but as a required part of their business operations. However, all participants indicated that they are not currently ready for Smart Grid and need time to develop their management strategies and bring their equipment and equipment control systems into compliance with their desired abilities. "*The timeframe* [to Smart Grid] *needs to be realistic.*"

Participants also see Smart Grid as a motivational factor to move into new equipment monitoring approaches that will help them identify when a technology performance issue needs to be corrected. "*We will have real-time knowledge of what is going on. It's a red flag issue, we can use it to look at what is going wrong on-site and know what is causing energy use to go up* [and fix it]. *We can keep track of kW to see if we are on target or off. This should help us grab it right then, in real time.*"

When managers were able to provide some specificity about what they expected from Smart Grid, they noted that Smart Grid was all about "*taking advantage of changes in market price to buy cheaper energy and reduce energy costs*" while still meeting user needs.

The following table provides their "importance" scores pertaining to their SBA participation and Smart Grid objectives.

Objectives Relating to Smart Grid	Average Importance	Lowest Rating	Highest Rating	N
Integrate HVAC system operations into control strategies	9.1	8	10	8
Integrate system control software and control sequencing and setpoints	8.8	8	10	8
Taking advantage of Smart Grid to manage non-HVAC refrigeration	8.5	8	9	2
Energy management, use tracking, and reporting	8.4	6	10	8
Alarms and action reports when use strategies are not working as specified or are outside of alarm trigger points, or when maintenance is due	8.4	7	10	8

Take advantage of hourly pricing to save energy and costs	8.3	7	9	8
Assessing opportunities to save energy via Smart Grid compatible equipment upgrades	7.7	7	8	7
Integrating Smart Grid and continuous commissioning analysis and system changes	7.6	4	10	8
Energy project design and specification assistance to assure Smart Grid capability	7.4	5	8	8
Integrating distributed generation into supply mix	7.3	2	10	6
Integrating Smart Grid and retro-commissioning analysis and system changes	7.3	4	9	8
Major capital equipment installation assistance to assure Smart Grid compatible operations	6.9	3	8	7
Benchmarking services to compare with other buildings like yours	6.8	4	9	8
Assessing where and when behavior changes can be most beneficial	6.6	3	9	7
Taking advantage of Smart Grid to manage lighting systems	6.1	3	10	8
Analysis of energy use per occupant or by square feet	5.8	2	10	8
Taking advantage of Smart Grid to manage water heating	5.6	2	9	8
Taking advantage of Smart Grid to manage non-HVAC pumps or motors	5.5	1	9	8
Taking advantage of Smart Grid to manage non-HVAC refrigeration	5.3	1	9	7

SBA's Impact on the Way Equipment O&M is Performed

The individuals responsible for equipment operations and maintenance (O&M) practices within each participating firm was asked if SBA has changed the way that they conducted their O&M activities. As noted in the responses presented in the following table, the results are not consistent across all the firms. However, the participants elected to answer this in two different ways. Two of the participants projected the changes that their participation would have on their O&M practices while the other two firms indicated that while they think that their participation will have an effect, they were not ready to project what that effect might be. The following table provides the responses to the way in which the O&M impact questions were answered by the four firms.

SBA has changed the way the ally does...	Number Responding with:			
	Yes	**No**	**Maybe**	**Too early to know**
Controls Management				
Calibrate controls	2			2
Check control sequences	2			2
Maintain a written sequence of operations for the control systems	1	1		2
Conduct point by point control checks	1	1		2

Reprogram settings and sequences	1	1		2
Review performance changes when control changes are made	1	1		2
Maintenance Practices				
Perform routine examinations and performance reviews	2			2
Track key system component performance indicators	1	1		2
Clean or replace filters	1	1		2
Check performance tolerances on vents, dampers, or valves	1	1		2
Run test to check component operations and system performance	1		1	2
Track or log system maintenance efforts	0	2		2
Performance				
Calculate savings achieved in terms of energy or demand	2	0		2
Calculate dollars saved from control or maintenance practices	2	0		2
Obtain and respond to performance alarms	2	1		2
Speed of repair or problem solving	2	0		2
Benchmark performance against other facilities	1	1		2
Track and log maintenance costs	1			2

Best Approach for Accomplishing Specific Types of Objectives

Participants were asked which one of three different approaches is best for accomplishing different sets of objectives affiliated with SBA. These are also the same types of services that would be related to taking advantage of Smart Grid's potential to control costs. The three approach options were to: A) accomplish that objective themselves, B) hire a for-profit contractor for that objective, or C) team with Duke Energy to accomplish that objective via a program such as the Custom Rebate or Non-Res Prescriptive. Nine different individuals were asked this question across the four interviewed participants. In some cases, the interviewees within the same firm provided different responses. Because the responses to these questions have competitive market value, all responses are presented in the following table, allowing the reader to understand the range of responses without identifying the participants providing those responses. The results from this table indicate significant diversity of opinions on how the participants would go about accomplishing their Smart Grid related objectives. However, it is clear from these responses that teaming with Duke Energy is viewed as one of the most important or the most important approach for these customers.

Which approach is preferred for reaching the following objectives?	Do it ourselves	Hire a for-profit contractor	Team with Duke Energy to do it
Take advantage of newest Smart Grid approaches to control costs	1	0	7
Best way to keep informed of benefits and risks of various control strategies and approaches	0	3	6

Brings the right skills, knowledge, and resources to the project	1	2	6
Offer for consideration only those strategies that are cost-effective	1	4	4
Identify all possible energy management strategies in customer's facilities	2	2	4
Make sure the full range of energy efficiency and management strategies are considered for decision	4	2	3
Best way to keep project on time and on budget	5	1	3
Uses service providers that the customer can trust	4	2	3
Install only the most reliable systems & equipment	2	3	3
Most accurately documents achieved savings via a control strategy	3	2	3
Offer equipment pricing packages that best meets the customer's needs	2	2	3
Best manage a project's costs and budgets	4	2	2
User service providers that put customer's needs first	5	1	2

Performance Feedback

All key managers indicated that they are satisfied with the performance feedback systems planned into the project and are confident that these systems will allow them to keep the system performing as planned and designed and achieving the projected energy savings. However, these managers also report that they are not going to abandon their current approaches until they are certain that the new approaches are accomplishing their objectives. These interviewees report that SBA is bringing in new approaches for monitoring and keeping them informed on how their equipment is operating and how their building is performing relative to expectations and projections. However, these participants express some degree of caution, and are taking a "trust but confirm" approach. Most managers indicated that the ability of SBA and these changes are key to their future efforts. They must see success in these efforts before they will place full trust in SBA's projections. *"Let's see the numbers; we would not have looked at all of this. We are on the right track, but we will see."* Yet these participants are also optimistic and report that they are confident that the savings will be there if the equipment and control strategies that they are implementing work as expected. All participants like the way SBA is working with them and their team members to make sure they obtain and can use the performance feedback provided.

Are Customers Interested in Behavior Change Opportunities?

All four of the participants are interested in the opportunities to acquire additional energy savings by changing the behaviors of the people who use their buildings. However, all participants also indicated that changing behavior has to be done carefully and not alienate their users. All participants indicated that the functions performed within their buildings must not be impacted in a way that causes issues with those users. These concerns were expressed regardless of the how the buildings are used or if they are used by employees, clients, or customers. Maintaining productivity and or user satisfaction is paramount to these participants and overrides any interest in behavior modification to capture additional energy savings. Still, if savings can be captured without negative impacts, these participants are interested in carefully considering these potentials.

Equipment Purchase Decision Criteria

Interviewees were asked about the criteria they use to make equipment purchase and replacement decisions and to rate the importance of that criteria. As noted in the following table, the energy costs to operate the equipment, the ability to obtain parts, the total life-cycle cost (cost to purchase, install, operate, and maintain), the internal rate of return from the savings, and the strength of their vendor relationship are the most important criteria for these four participants. Likewise, the next five most important criteria are similar to but supportive of the top rated criteria (past equipment performance, simple pay-back, maintenance cost, contractor availability, and expected life of the equipment). Next in importance is the equipment recommendation that they would receive from Duke Energy. The first cost of the equipment (cost to buy) for this group of participants is the 15th most important criteria, scoring well below other considerations. This data indicates that SBA's participants consider all costs associated with an equipment purchase decision before they buy, and that the ability to maintain least total cost operations and acquire a return on their investment are most important. But also important is the ability to service and maintain that equipment through parts availability and access to service professionals when it is needed.

	Criteria	Average importance	Lowest Rating	Highest Rating	N
1	Energy costs to operate	8.2	7	10	5
2	Parts availability	8.2	6	10	5
3	Total life-cycle cost	7.8	7	10	5
4	Internal rate of return on investment	7.6	6	10	5
5	Strength of vendor relationship	7.6	4	10	5
6	Past performance of equipment	7.4	5	10	5
7	Simple pay-back analysis	7.3	6	8	4
8	Maintenance costs	7.0	6	8	5
9	Contractor or trade ally availability	7.0	6	8	5
10	Expected useful life of the equipment	7.0	5	9	5
11	Utility recommendation	6.8	5	8	4
12	First costs of the equipment	6.0	3	8	5
13	Familiarity with the brand	6.0	4	8	5
14	Brand name or brand trust	5.8	4	8	5
15	Contractor or trade ally recommendation	5.0	5	5	4

Energy Policies

Only one of the participants indicated that they have a formal corporation-wide energy policy that drives energy related decisions. However, all participants indicated that they have an informal policy or a corporate energy ethic that focuses on energy efficiency and environmental performance. For one of the participants, having an environmental and energy efficient focus is critical, as their clients demand environmental leadership and performance. This participant indicated that they have a formal policy and they must report progress on their energy and environmental objectives to their Board of Directors. The other participants indicated that energy efficiency and environmental performance is important to their organization. One firm indicated that while they do not have an energy policy, they want to be seen in the market as being the most energy efficient and environmental friendly firm in their line of business. The other two participants consider energy efficiency and environmental performance important and they projected that it will become more important in the future.

One of the participants indicated that not only is it important for them to be energy efficient and environmentally focused, but they have an objective to help make their energy suppliers more energy efficient and reduce the amount of greenhouse gas emissions associated with the energy that they buy. One participant indicated that they have formed a team in their organization to specifically focus on helping the organization be “greener” each year. Another firm indicated that they have a corporate objective to lower consumption by 25% by 2012 and report on their progress toward that objective.

All of the participants want to have energy efficient buildings, with two of the participants having specific LEED objectives for all new construction, while others want to move toward LEED-like or Energy Star performance without going through the costly LEED certification process.

Marketing of the Smart Building Advantage Approach

Participants were asked to recommend SBA marketing approaches that the SBA should use to make Duke Energy’s customers aware of SBA in a way that will allow Duke Energy to capture greater numbers of participants. All participants provided recommendations. All participants recommended the use of case studies, stories in trade journals, partnering with organizations that focus on energy savings and environmental issues, and the expansion of the Duke Energy website. Three of the four participants recommended displays at trade shows, presentations at industry conferences, and working with industry groups and organizations. Two of the participants suggested that white papers focusing on the energy savings that are being achieved by these approaches should be used and working with consortiums of companies within specific segments that can most take advantage of SBA. None of the participants suggested that social media tools should be used, and all interviewees indicated that they do not use social media for professional or work-related information. Most of the interviewees suggested that social media web-sites are “for younger people” and all question if these are appropriate for conveying SBA marketing materials, ideas, or concepts. The following table provides the responses of the interviewed participants. The results are presented for the four SBA participants such that a score of 4 means that it was recommended by at least one of the individuals interviewed from each firm.

Marketing Approach	Recommended	Not Recommended	Unsure
Case studies	4	-	-
Trade journals	4	-	-
Partner with other organizations	4	-	-
Expand the Duke Energy website	4	-	-
Trade shows	3	1	-
Industry conferences	3	-	-
Work with industry groups & organizations	3	1	-
White papers and publications	2	1	1
Consortiums of companies	2	1	1
Social media tools	-	2	2
Other methods	-	-	-

The interviewees provided qualifying comments about their recommendations. These comments are noted below for each of the marketing approaches covered in the interviews.

Case studies

- "These can be good if they are a "show me the data" study. You have to make them real studies with real companies, real projects, real data, and real savings. Get them to the engineers and the administrative decision makers."
- "These are good, get them out to the customers via the account reps."
- "These need to be objective (not sales pieces), truthful, and real. Then they can be effective."
- "This is a very good approach."

Trade journals

- "The medical services administrative and health care journals are good, and *Facility Manager* is a good one."
- "I would recommend *Facility Manager*."
- "*Facility Manager* is a good one."
- "*Energy Biz Today*, *Gas Daily*, and *Electric Daily* are good ones."

Partner with other organizations

- "The DOE and EPA have a lot of networks in the industry. They could be good partners."
- "USDOE, LEED, Energy Star, state and local energy agencies, tax credit organizations, stimulus package networks, and renewable energy organizations should be considered."
- "Get with organizations that can leverage other funds. For example, ARRA[1] and the Department of Energy."

[1] American Recovery and Reinvestment Act

- "Partner with the green organizations. The green energy and solar stuff reaches some of the right people."
- "The American College and University President's Climate Commitment Organization (ACUPCC) would be good."
- "Sustainability organizations might be good."
- "Endowment foundation organizations that are looking to be seen as environmentally active."

Expand the Duke Energy website

- "This is what we use now. The Duke site is a main link for us."
- "The Duke site "My Energy Portal" message center is good."
- "The Duke site and the internet is where people go for information now."
- "Put it on the Duke web site and have it linked to the energy bills pages with icons. Realize it has to be very good, very fast, and very easy. We are information overloaded with the stuff on the internet, but if it is good, easy, and focused it can work well."

Trade shows

- "Need to be very selective, not all are good. Not the engineering shows, but the administration and operations side for the health care industry, for example. And focus on the money not the technology. Focus on the investment benefits and the returns."
- "Shows like the EEI[2] would be good."
- "Focus on shows like NeoCon[3]."

Industry conferences

- "Get on the agenda of EPA, Energy Star, ASHRAE[4], and other similar conferences. Go to the administrative and management conferences that focus on costs and benefits."
- "Go to the Association of Physical Plant Administrators."
- "BOMA[5] and NAIOP[6] would be good ones."
- "You need to be very good at these things and have displays that capture attention or you will not be successful. But if you can grab attention, then IFMA[7], BOMA and IIDA[8] are good."

Work with industry groups & organizations

- "The North Carolina Health Care Engineers is an excellent group. There are other professional associations and trade groups that might be good."
- "Work with BOMA and NEMA[9]."

[2] Edison Electric Institute
[3] MMPI's NeoCon Trade Shows
[4] The American Society of Heating, Refrigerating and Air-Conditioning Engineers
[5] Building Owners and Managers Association International
[6] Commercial Real Estate Development Association
[7] The International Facility Management Association
[8] International Interior Design Association

White papers and publications

- "These can be good if you reach the right people, but only a few of us read white papers."
- "This is okay for some. You have to reach the right people, and this is not a great approach for most of us."

Consortiums of companies

- "The health care people go to annual meetings. If you can get to these, that might help. Notation and Premier and buyer groups might also help."
- "These may help, but be careful of liability of working with teams of companies. Utility networking within your customers should be used."
- "Use Duke as a conduit to customers. We have developed a California Bay Area group called the Silicon Valley Leadership Group with 200 members and monthly meetings, projects, and technology reviews. It is a great information source that focuses on utility programs and other opportunities."

Social media tools

- "These may be okay for residential programs, but not commercial sector programs."
- "Not for my generation, maybe the younger generation, it is what they do now."
- "We do not use them, but younger people do."
- "There are some social media linkages that can work, but may not be a good approach. They may have some professional people out there using these things. As a company we have to go there, we cannot avoid it, but they may not be effective and have some real down-sides to them."

Other methods

- "Showcase this at the annual Duke Energy customer meetings."
- "Launch a top-down approach with the large key customers. Go to the top people (the owners, presidents, CEOs, CFOs, the senior people) and get them to focus on it, they will pass it down if it looks promising. When things come from the top, we pay attention to it."
- "Market this as a new way to find revenue in a company."
- "Bring in the high quality people. Get people like Paul involved and let them work with the customers to make the choices of what to do. Build trust in the industry via SBA. Bring in the customer's management and administration, get them to the table. Help move decisions up the chain of command."

Market Effects

The interviewed participants report that SBA is having a significant educational impact on their engineering and maintenance teams and how they plan future changes, but has not yet moved beyond the people directly involved. Most participants are not showcasing their participation to a large degree and do not plan to until savings are verified.

[9] National Electrical Manufacturers Association

However, all participants indicate that corporate management is taking note of SBA and is interested in the results. The engineering teams and people responsible for the equipment and performance indicate that SBA has expanded what they thought they could do and has caused them to think beyond the single piece of equipment and focus more on a building integration systems approach to controlling cost and meeting the demands of the buildings' users. Interviewees report that if the projects they are implementing prove successful, their companies will be interested in more projects like these and will be more supportive of allocating resources to them. However, at this time the effects of SBA beyond the engineering and financial managers are limited.

Summary Report

Annual Summary of EM&V Activities for Duke Energy's Energy Efficiency Programs in North Carolina

Prepared for

Duke Energy

139 East Fourth Street
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March 15, 2011

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About This Summary Report

This report presents the results of all M&V activities that were completed between March 4, 2010 and March 14, 2011, and a summary of evaluation activities that are in progress for Duke Energy's energy efficiency programs in North Carolina.

For evaluations that have been completed, a summary of findings is presented. For evaluations that are currently in progress, a summary of the status of the evaluation along with the expected delivery of the draft report is provided. Planned evaluations are presented with the tasks and timeline for the evaluation.

Completed Evaluations

This section presents the key findings and recommendations for all evaluations completed between March 4, 2010 and March 14, 2011.

Non-Residential Smart $aver® Prescriptive

The evaluation report was finalized on February 6, 2011, and is filed as "**Ossege Exhibit B – Non Res Smart $aver Prescriptive**".

Evaluation Contractor's Recommendations for Duke Energy to Consider

The following program recommendations are provided by TecMarket Works, the independent evaluation contractor.

1. Evaluate the usefulness of a possible training webinar. Consider recording a webinar for future web access. A webinar may prove to be a benefit only if it is offered live, with a live question and answer period.

2. Explore the effectiveness of email and electronic campaigns and survey trade allies to determine the frequency with which they prefer to be contacted. Reports from the field suggest that trade allies may prefer the less-expensive email campaigns over mailed materials. This may allow the Non Res Smart $aver® to have a broader reach at a lower cost.

3. Duke Energy should consider the feasibility of providing more case studies on customers who have implemented energy efficiency projects using high-priority high-impact measures in program materials provided to trade allies for them to share with their customers. Duke Energy may wish to include case studies on customers from several market segments. If built correctly, such case studies would increase the understanding of the Smart $aver® program by customers in different market segments because they would have examples to which they can relate, lowering the perceived risk and uncertainty for new participants.

4. Duke Energy should explore the feasibility of developing a coordinated marketing campaign for one market segment, implementing it as a pilot, and evaluating its effectiveness. A small pilot would allow Duke Energy to assess whether targeting marketing to one segment would be a more effective approach for future program efforts.

5. Duke Energy and WECC should jointly share and discuss their technology selection processes. This would allow both parties to better provide feedback in order to make accurate estimates of market activity. This would also allow both Duke Energy and WECC to explain, if the trade allies ask, why certain technologies are not included.

6. WECC should provide timely feedback to Duke Energy about whether they believe the projected market activity levels provided by Duke Energy are realistic, based upon WECC's experience in the field. This would allow Duke Energy to use WECC's direct experience in the field to relay any upcoming customer purchasing trends.

7. If poor economic conditions are expected to impact customers' ability to take on retrofit projects, and if there is enough spread among the energy efficiency levels of equipment available to make offering multiple levels of efficiency a viable option, Duke Energy

should assess whether it is feasible to test a tiered prescriptive program that would allow customers to still install energy efficient technologies when the highest efficiency models are priced out of their current means. However, Duke Energy should not trade off higher levels of free ridership in exchange for increased participation in a program that achieves lower levels of energy savings. It is possible that cost per achieved net kWh would be increased under such an offer depending on how the market would respond.

8. Explore whether it is feasible to create marketing and outreach campaigns that focus on lifecycle costs. This may allow customers to look beyond consideration about a measure's capital cost and its incentive, and understand the energy savings that would be delivered over the measure's effective useful life.

9. Make the template for itemizing invoices available online. This guidance would allow trade allies and customers to send in more accurate applications that would be rejected less frequently and could be processed more quickly and cost effectively, without WECC needing to contact applicants for missing information.

10. Duke Energy should consider conducting usability studies and satisfaction surveys of the online application process. This may allow Duke Energy to quantify any reduction in application speed and any increase in customer satisfaction with the application process.

11. Duke Energy should consider the feasibility of designing, implementing, and evaluating a pilot program to help <500 kW customers to prioritize energy efficient projects. This may allow more Duke Energy customers to achieve greater savings by providing them with a more complete picture of their energy efficiency options.

12. Duke Energy should consider the potential benefits of increased market segment penetration if marketing were structured to specifically focus on barriers for a particular key market segment. Duke Energy may want to do this by identifying one high priority market and conducting a characterization study about that market. Duke Energy might then identify that market's specific barriers to participation and develop a logic model that specifies a strategic approach toward overcoming those barriers. Duke Energy can then evaluate the effectiveness of the approach at the end of the program cycle. This would allow Duke Energy to see if they would be able to successfully drive greater activity in a particular segment if there was a need for doing so in the future.

Non-Residential Smart $aver® Marketing Approach: Smart Buildings Advantage

This evaluation reviews the Company's marketing approach for promoting greater participation in its Non-Residential Smart $aver Custom and Prescriptive programs. The Phase 1 evaluation was done to examine why people respond to the proposed approach and to provide early feedback to Duke Energy on any customer issues that arose. The report was finalized on March 1, 2011 and is filed as "**Ossege Exhibit C – Non-Residential Smart $aver Marketing Approach: SBA**".

The report contains recommendations provided by the prospective Non-Residential Smart $aver participants, but not by TecMarket Works as this was not a process evaluation. The full process evaluation (Phase 2) will examine the issues and participants' recommendations and will include evaluator recommendations.

Residential Smart $aver® CFL Program

This evaluation report was finalized on February 15, 2011. The full report is filed as "**Ossege Exhibit A – Residential Smart $aver CFLs** ".

Evaluation Contractor's Recommendations for Duke Energy to Consider

The following program recommendations are provided by TecMarket Works and BuildingMetrics, the independent evaluation contractors.

1. Consider conducting light logger studies at different times of the year to observe the daylight effect.

2. Link light logger installations unambiguously to self-reported hours of use data.

3. Continue use of targeted marketing efforts to identify customers most likely to purchase CFLs during the specific promotion or campaign. 2008 targeted messaging analysis shows that targeting messages to customers based on likelihood of adoption is successful in providing lift to populations that were not as likely to purchase CFLs. (Note: during the drafting of this report Duke Energy has continued testing motivational message content and redemption rates and reports that they have narrowed the messaging to energy and environmental appeals that experience the higher adoption and redemption rates and have moved to the use of free product coupons that together are substantially increasing redemption rates for CFLs.)

4. Savings for typical CFL bulbs may decrease over the long term as more customers adopt CFLs and continue to install bulbs in lower use sockets and fixtures. Recognizing the need to cost-effectively distribute CFLs, Duke Energy designed a tracking system to mitigate over-distribution of traditional CFLs. Consider transitioning the CFL program to incorporate other types of CFL offers, such as specialty bulbs (candelabras, torchieres, outdoor, etc.), LEDs, and other emerging technologies as they become cost effective. (Evaluation Review Follow-Up Note: Duke Energy reports that they are currently examining the inclusion of specialty bulbs to understand their potential with both past CFL redeemers and previous purchasers of CFLs as well as approaches for reaching new customers with specialty bulb appeals and offers. In addition, TecMarket Works is currently assessing the market for CFLs and will address the potential for specialty bulbs in the CFL potentials report to be delivered in April 2011. Duke Energy also reports that CFL adoption has increased due to offering web and phone-based ordering platforms where CFLs can be shipped directly to the customer's home as soon as they are ordered. Duke Energy customers can check eligibility and request CFLs by accessing a unique URL or OLS (Online Services) or by calling a toll-free number.

5. Consider incorporating a market effects study to identify ways to transition the program moving forward as traditional incandescents are phased out in the coming years, as shown in the table below.

EISA Schedule for General Service Incandescent[1]

Current Wattage	Rated Lumen Ranges	Maximum Rated Wattage	Minimum Rated Lifetime	Effective Date (Manufactured on or after)
100	1490-2600	72	1,000 hours	1/1/2012
75	1050-1489	53	1,000 hours	1/1/2013
60	750-1049	43	1,000 hours	1/1/2014
40	310-749	29	1,000 hours	1/1/2014

6. Consider coupling CFL efforts with other energy saving measures and/or programs. Customers did not buy many other energy efficiency items in addition to the CFLs when making their CFL purchases. Program managers could leverage both redeemer and non redeemers' awareness of ENERGY STAR to incorporate other energy saving items and/or encourage customers take other energy saving actions at the same time they are purchasing CFLs. Coupon redeemers purchased other energy saving measures (caulking, weather stripping, low-flow showerhead) in small quantities and might be interested in other simple energy saving measures if they were co-marketed with a CFL offer. Both redeemers and non redeemers may be interested in such measures as ENERGY STAR appliances, or other Duke Energy programs offering energy efficient measures such as HVAC or home audits. (Evaluation Review Follow-Up Note: Duke Energy reports that they have already started coordinating program services to include multi-product appeals and exposure in their small business programs, the Home Energy House Call program, neighborhood canvassing, and are considering other programs that can act as aggregation efforts to expose customers to multiple measures.)

7. Non coupon redeemers are generally not influenced by receiving Duke Energy coupons to purchase CFLs elsewhere, however, the price of CFLs is a factor for these customers. Consider additional marketing strategies for these customers that incorporate the Duke reduced price of CFLs, recommendations of friends and family, and other types of advertising appeals. These customers were more influenced by in-store advertising than the coupon redeemers, so other types of offers for CFL savings, such as point of purchase offers, may appeal to these customers. (Evaluation Review Follow-Up Note: Duke Energy reports that they have started these efforts with property management programs, business reply cards and web campaigns.)

[1] Source:
http://www1.eere.energy.gov/buildings/appliance_standards/residential/pdfs/lighting_legislation_fact_sheet_03_13_08.pdf

Current Evaluation Activities

Energy Efficiency Education Program for Schools

This evaluation report is currently being drafted. The draft report is due to Duke Energy during the second quarter for Process evaluation, and early in the 3rd quarter for Impact evaluation..

Home Energy Comparison Report (SC Pilot)

These evaluation activities are currently being drafted. The South Carolina HECR draft report is due to Duke Energy during the second quarter.

Residential Energy Assessments - Home Energy House Call

This draft evaluation report is in review by Duke Energy to be finalized second quarter.

Non-Residential Energy Assessments

The draft report for the 2009-2010 program is in progress, with a draft report due date of March 31, 2011. This report was scheduled (in March of 2009) to be completed in Q2-Q3 2010, but the evaluation was delayed due to low participation in the program.

Non-Residential Smart $aver® Custom

This evaluation is currently being conducted on an ongoing basis as customers become participants. The 2010 report was scheduled (in March of 2009) to be completed in Q2-Q3 2010, but the evaluation was delayed due to low participation in the program. This evaluation is now planned to be completed in Q2 of 2011.

Residential Energy Assessments - Personalized Energy Report and Energy Efficiency Website

This evaluation report is currently being drafted. The draft report is due to Duke Energy by the second quarter.

Power Manager®

This draft evaluation report is in review by Duke Energy.

PowerShare®

This draft evaluation report is in review by Duke Energy.

Residential Smart $aver® Impact Evaluation

The impact report was delayed from the planned delivery date of Q1 in 2010 because of incomplete sub-metering spreadsheets discovered when the impact evaluation began. The impact evaluation was further delayed due to the need for a more in-depth (customer by customer) review of impacts. This is scheduled to be completed by April 15, 2011.

Smart Energy Now (NC Pilot)

This program evaluation is currently being planned.

Planned Evaluation Activities

Energy Efficiency Education Program for Schools

The process evaluation will include program manager, implementer and teacher interviews to assess program operations, and student family surveys to assess program awareness, satisfaction, and compliance with installations and recommendations. The impact evaluation will consist of engineering estimates and billing analysis.

Energy Efficiency Education Program for Schools (K12 Curriculum)	**Timing**
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments to be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews will be done on-site or over the phone.	Q2 2011
Interview Teachers	
Instrument Development – Interview instruments were developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews will be conducted over the phone.	Q2-Q4 2011
Student Family Surveys	
Instrument Development – Survey instruments will be developed by TecMarket Works and Duke Energy.	Q2 2011
Conduct Surveys – These surveys will be mailed.	Q2-Q4 2011
Analysis	Q1 2012
Reporting	Q2 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q3 2012
Impact	
Engineering Estimates	Q1 2012
Billing Analysis – A statistical billing analysis of program participants will be conducted and compared to the engineering estimates.	Q2 2012
Reporting	Q2 2012

Home Energy Comparison Report (Pending Approval)

The 2012 program process evaluation will include program manager and implementer interviews to assess program operations, and participant surveys to assess program awareness, recall, and satisfaction. The impact evaluation will include a billing analysis.

Home Energy Comparison Report	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2012
Conduct Interviews – These interviews will likely be done over the phone, but may be held on-site at Duke Energy offices.	Q3 2012
Participant Surveys	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q2 2012
Conduct Surveys – These surveys will be done over the phone.	Q2-Q4 2012
Analysis	Q4 2012
Reporting	Q3 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q1 2013
Impact	
Billing Analysis – A statistical billing analysis of program participants will be conducted and compared to the engineering estimates.	2013
Reporting	Q1 2013

Residential Energy Assessments: Home Energy House Call

The process evaluation will include program manager and implementer interviews to assess program operations, and participant surveys to assess program awareness and satisfaction. The impact evaluation will be done via billing analysis.

Home Energy House Call	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2-Q3 2011
Conduct Interviews – These interviews will likely be done over the phone, but may be held on-site at Duke Energy offices.	Q1 2012
Participant Surveys	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q2-Q3 2011
Conduct Surveys – These surveys will be done over the phone.	Q1 2012
Analysis	Q2 2012
Reporting	Q2 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q2-Q3 2012
Impact	
Billing Analysis – A statistical billing analysis of program participants will be conducted and compared to the engineering estimates.	Q4 2012
Reporting	Q4 2012

Residential Assessments: Home Energy Manager (Pending Approval)

The process evaluation will include program manager and implementer interviews to assess program operations, and participant surveys to assess program awareness and satisfaction. The impact evaluation will be done via billing analysis.

Home Energy Manager	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews will likely be done over the phone, but may be held on-site at Duke Energy offices.	Q2 2011
Participant Surveys	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q2-Q3 2011
Conduct Surveys – These surveys will be done over the phone.	Q3-Q4 2011
Analysis	Q1 2012
Reporting	Q2 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q2 2012
Impact	
Billing Analysis – A statistical billing analysis of program participants will be conducted and compared to the engineering estimates.	Q3-Q4 2011
Reporting	Q4 2012

Low Income Energy Efficiency and Weatherization Assistance Program

The process evaluation will include program manager and CAP staff interviews to assess program operations, and participant surveys to assess program satisfaction for the Agency Assistance Kits and the Refrigerator Replacement Low Income programs. The impact evaluation will consist of a billing analysis and engineering estimates.

Low Income	Timing
Process	
Interview Program Managers and Implementers (CAP staff)	
Instrument Development – Interview instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews will likely be done over the phone, but may be held on-site at Duke Energy offices.	Q2-Q3 2011
Participant Surveys	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q3 2011
Conduct Surveys – These surveys will be done over the phone.	Q3-Q4 2011
Analysis	Q4 2011
Reporting	Q1 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q1 2012
Impact	
Billing Analysis – A statistical billing analysis of program participants will be conducted and compared to the engineering estimates.	Q3-Q4 2012
Engineering Estimates – Engineering estimates of savings will be developed for CFL use identified through the participant surveys. Average savings per participant based on self-reported efficiency actions will be calculated.	Q3-Q4 2012
Reporting	Q4 2012

Non-Residential Energy Assessments

The 2011 process evaluation will include program manager and implementer interviews to assess program operations, and participant surveys to assess program awareness, satisfaction, and compliance with recommendations. The impact evaluation will include engineering estimates and billing analysis.

Non-Res Energy Assessments	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments were developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q3 2011
Conduct Interviews – These interviews will be done on-site and/or over the phone.	Q3 2011
Participant Surveys	
Instrument Development – Survey instruments were developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q3 2011
Conduct Interviews – These surveys will be done over the phone.	Q3 2011
Analysis	Q4 2011
Reporting	Q1 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q2 2012
Impact	
Engineering Estimates	Q4 2011
Billing Analysis – Engineering estimates of savings by participant will be incorporated into a statistically adjusted engineering (SAE) billing analysis to calculate the energy savings realized in customer bills.	Q4 2011
Analysis	Q4 2011
Reporting	Q1 2012

Non-Residential Smart $aver® Custom

The process evaluation includes program manager and implementer interviews to assess program operations, and participant surveys to assess program awareness, satisfaction, and equipment replacement, and end-use persistence. The impact evaluation will include selective, short term monitoring and building simulation modeling as appropriate.

Non-residential Smart $aver® Custom	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments to be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews	Q4 2011
Participant Surveys – These interviews will be done over the phone.	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q2 2011
Conduct Interviews	Q2 2011 - Q2 2012
Interview Program Vendors	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q2 2011
Conduct Interviews	Q2 2011 - Q2 2012
Analysis	Q2 2011 - Q2 2012
Reporting	Q2 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q3 2012
Impact	
Selective monitoring. Pre and post-installation monitoring conducted at sites installing lighting, HVAC, and process equipment to verify baseline equipment and operations.	Q2 2010 - Q1 2012
Data Cleaning. Data from monitoring.	Q2 2010 - Q1 2012
Engineering Estimates Engineering models will be developed using pre/post data to estimate savings after post-installation data collection is complete.	Q1 2012
Building Simulation Modeling. Calibrated DOE-2 simulation models will be run at selected sites to estimate savings for projects where pre/post monitoring is not appropriate. This process will be invoked as customer participation rates increase, and for primarily new construction projects.	Q1 2012
Reporting	Q2 2012

Non-Residential Smart $aver® Prescriptive

The process evaluation includes program manager and implementer interviews to assess program operations, and participant surveys to assess program awareness, satisfaction, equipment replacement, and end-use persistence. The impact evaluation includes short term monitoring and engineering estimations.

Non-Residential Smart $aver® Prescriptive Incentives	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews were conducted on-site and over the phone.	Q3 2011
Participant Surveys	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q3 2011
Conduct Interviews – These surveys were done over the phone.	Q3-Q4 2011
Interview Program Vendors	
Instrument Development – Interview instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q3 2011
Conduct Interviews – These interviews would be done over the phone.	Q3-Q4 2011
Analysis	Q1 2012
Reporting	Q2 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q3 2012
Impact	
Selective monitoring – Monitoring of occupancy sensors and linear fluorescents will be conducted in 2011.	Q2-Q4 2011
Engineering Estimates – Engineering estimates of monitored data	Q1 2012
Reporting	Q2 2012

Residential Energy Assessments: Personalized Energy Report and Energy Efficiency Website

The process evaluation will include program manager and implementer interviews to assess program operations, and participant surveys to assess program satisfaction. The impact evaluation will consist of a billing analysis and engineering estimates.

Personalized Energy Report	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q3 2011
Conduct Interviews – These interviews will likely be done over the phone, but may be held on-site at Duke Energy offices.	Q3 2011
Participant Surveys	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q3 2011
Conduct Surveys – These surveys will be done over the phone.	Q3-Q4 2011
Analysis	Q1 2012
Reporting	Q2 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q3 2012
Impact	
Billing Analysis – A statistical billing analysis of program participants will be conducted and compared to the engineering estimates.	Q3-Q4 2012
Engineering Estimates – Engineering estimates of savings will be developed for efficiency actions identified through the participant surveys. Average savings per participant based on self-reported efficiency actions will be calculated.	Q3-Q4 2012
Reporting	Q4 2012

Power Manager®

The process evaluation includes program manager and implementer interviews to assess program operations, and participant and nonparticipant surveys to assess program awareness, satisfaction, and energy-related behaviors. The impact evaluation includes whole house metering, spot metering, and data logger analysis. We will be doing event-specific surveys to measure customer awareness of and comfort during an event from a random sample of customers with canon switches (who have not participated in previous M&V efforts) within 48 hours after a peak event.

Power Manager®	**Timing**
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments were developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q1 2011
Conduct Interviews – These interviews were done over the phone.	Q2 2011
Participant Surveys	
Survey Development – Survey instruments will be developed by TecMarket Works and Duke Energy.	Q1-Q2 2011
Conduct Surveys – These surveys will be done by phone with a sample of participants within 48 hours of events.	Q2-Q3 2011
Analysis	Q4 2011
Reporting	Q1 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q2 2012
Impact	
Whole-house metering on random sample. – Whole premise interval meters installed on a sample of Power Manager participants.	Q2-Q3 2011
Time-series framework – to estimate baseline energy usage. The interval data will be analyzed to estimate load reductions during control events.	Q4 2011
Spot metering and data logger samples during peak season. – Data loggers installed at a sample of participant sites to estimate the fraction of units responding to the demand signal. Spot metering used to estimate the connected load of the controlled units.	Q2-Q3 2011
Analysis of Data	Q1 2012
Reporting	Q2 2012

PowerShare®

The process evaluation will include program manager interviews to assess program operations. The impact evaluation will include time-series regression analysis of interval demand data, analysis of system operations.

PowerShare®	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments to be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q3 2011
Conduct Interviews – These interviews will be done over the phone.	Q3-Q4 2011
Participant Surveys	
Instrument Development – Survey instruments were developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q3 2011
Conduct Surveys – These interviews will be done over the phone.	Q3-Q4 2011
Analysis	Q1 2012
Reporting	Q2 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q2 2012
Impact	
Time-series regression analysis. Interval data collected at PowerShare sites were entered into time series regression model to estimate the impacts resulting from load control events.	Q3-Q4 2011
Observations of compliance (analysis of system operations data) Interval data were used to determine if customers are complying with terms of their load control agreements.	Q3-Q4 2011
Reporting	Q4(2011)-Q1 2012

Residential Smart $aver®

The process evaluation will include program manager and implementer interviews to assess program operations, participant surveys to assess program awareness, satisfaction, equipment replacement, and end-use persistence, and non-participant interviews to the reasons for not participating. The impact evaluation will include an engineering walk through; short term monitoring, building simulation modeling as appropriate.

Residential Smart $aver®	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments were developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews will be done on-site or over the phone.	Q3 2011
Participant Surveys	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q3 2011
Conduct Interviews – These surveys will be done over the phone.	Q3 2011
Non-Participant Surveys	
Instrument Development – Survey instruments are developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q3 2011
Conduct Surveys – These surveys will be done over the phone.	Q3-Q4 2011
Interview Program Vendors	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q3 2011
Conduct Surveys – These surveys would be done over the phone.	Q3-Q4 2011
Analysis	Q4-Q1 2012
Reporting	Q2 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q2 2012
Impact	
Selective monitoring. Pre/post monitoring of whole HVAC systems. These data will be used to inform the DOE-2 simulation models	Q2 2012
Site visits. Duke staff will conduct site visits at a sample of sites to verify unit installation and gather building characteristics data.	Q2 2012
Data Cleaning. Monitored data from whole HVAC systems will be analyzed and prepared for the engineering analysis.	Q3 2012
Engineering Estimates. Building characteristics data from the verification surveys, and the data from the monitoring sample will be used to develop and calibrate a series of prototypical DOE-2 models representing a range of building ages and operating modes.	Q3 2012
Building Simulation Modeling. The calibrated DOE-2 simulation models will be run using long term average weather data for Carolina;	Q3 2012

Savings will be calculated for air conditioners, heat pumps, and dual fuel heat pumps from SEER 14 to SEER 18. Savings from the models will be assigned to program participants according to their location, system type and system efficiency.	
Billing Analysis. Engineering estimates of savings by participant will be incorporated into a statistically adjusted engineering (SAE) billing analysis to calculate the energy savings realized in customer bills.	Q3-Q4 2012
Reporting	Q4 2012

Non-Residential Smart $aver Marketing Approach: Smart Buildings Advantage

Phase 1 of this evaluation is complete.

Phase 2 of this evaluation consists of commercial participant interviews. Interviews will be conducted both over the phone and on-site as in-depth exploratory interviews to identify reasons for engagement, expectation of results, how the approach and its associated processes integrate with the customer's needs/expectations and will assess the ability of Duke Energy to serve a valued and cost effective service.

Smart Buildings Advantage	Timing
Process	
Interview Program Participants	
Instrument Development – Interview instruments to be developed by TecMarket Works and will be reviewed by Duke Energy, and will be sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews will be done on site or over the phone.	Q2-Q4 2011
Analysis	Q1 2012
Reporting	Q2 2012
Impact	
Selective monitoring – Monitoring of systems affected by program will be conducted. Trend data from building automation systems will be supplemented by data loggers as necessary.	Q2-Q4 2011
Engineering Estimates – Engineering estimates of monitored data	Q1 2012
Reporting	Q2 2012

Residential Smart $aver® CFLs

Also referenced as “Residential Energy Smart$aver Energy Star Products”. The process evaluation includes program manager and retail site interviews to assess program operations, and participant and nonparticipant surveys to assess program awareness, satisfaction, and use/storage of CFLs. The impact evaluation includes participant surveys as well as lighting logger data collection and analysis.

Smart $aver® CFLs	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments to be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews to be done over the phone.	Q2 2011
Interview Retail Managers	
Instrument Development – Interview instruments to be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews to be done over the phone.	Q2 2011
Participant and Non Participant Surveys	
Instrument Development – Survey instruments will be developed by TecMarket Works and Duke Energy Market Analytics staff, reviewed by TecMarket Works and Duke Energy Market Analytics staff. Some surveys will be mailed to participants and non participants, some surveys will be conducted by phone.	Q1-Q2 2011
Surveys – These surveys will be conducted by phone and through mail.	Q2-Q4 2011
Analysis	Q1-Q2 2012
Reporting	Q2 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q3 2012
Impact	
Lighting logger metering on random sample. – Lighting loggers installed on fixtures in homes of a sample of CFL program participants.	Q3-Q4 2012
Analysis of Data	Q3-Q4 2012
Reporting	Q4 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q1 2013

Smart Energy Now (NC Pilot)

This evaluation is currently in planning, so the evaluation summary below may change as a result of program operational or implementation changes, changes in researchable issues, and the availability of evaluation resources.

The process evaluation will focus on assessing the design and implementation approach for the program in order to make recommendations for changes that can be expected to improve the impacts from or operational efficiency of the program. The impact evaluation will examine the savings associated with the behavior changes made by program participants and the savings achieved by coordination with the Smart $aver Prescriptive and Custom rebate programs.

Smart Energy Now	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments to be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews to be done over the phone and onsite.	Q3 2011 and Q4 2012
Interview Building Managers	
Instrument Development – Interview instruments to be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews to be done over the phone and onsite.	Q3 2011–Q4 2012
Interview Building Occupants	
Instrument Development – Interview instruments to be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews to be done over the phone and onsite.	Q3 2011–Q4 2012
Analysis	Q1 2013
Reporting	Q1 2013
Impact	
Identification of appropriate impact evaluation approach	Q2 2011
Analysis of energy impacts for actions taken by participants	Q3 2011-Q4 2012
Analysis	Q1 2013
Reporting	Q1 2013

Summary Report

Annual Summary of EM&V Activities for Duke Energy's Energy Efficiency Programs in South Carolina

Prepared for

Duke Energy

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March 15, 2011

Submitted by

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About This Summary Report

This report presents the results of all M&V activities that were completed between March 4, 2010 and March 14, 2011, and a summary of evaluation activities that are in progress for Duke Energy's energy efficiency programs in South Carolina.

For evaluations that have been completed, a summary of findings is presented. For evaluations that are currently in progress, a summary of the status of the evaluation along with the expected delivery of the draft report is provided. Planned evaluations are presented with the tasks and timeline for the evaluation.

Completed Evaluations

This section presents the key findings and recommendations for all evaluations completed between March 4, 2010 and March 14, 2011.

Non-Residential Smart $aver® Prescriptive

The evaluation report was finalized on February 6, 2011, and is filed as "**Ossege Exhibit B – Non Res Smart $aver Prescriptive**".

Evaluation Contractor's Recommendations for Duke Energy to Consider

The following program recommendations are provided by TecMarket Works, the independent evaluation contractor.

1. Evaluate the usefulness of a possible training webinar. Consider recording a webinar for future web access. A webinar may prove to be a benefit only if it is offered live, with a live question and answer period.

2. Explore the effectiveness of email and electronic campaigns and survey trade allies to determine the frequency with which they prefer to be contacted. Reports from the field suggest that trade allies may prefer the less-expensive email campaigns over mailed materials. This may allow the Non Res Smart $aver® to have a broader reach at a lower cost.

3. Duke Energy should consider the feasibility of providing more case studies on customers who have implemented energy efficiency projects using high-priority high-impact measures in program materials provided to trade allies for them to share with their customers. Duke Energy may wish to include case studies on customers from several market segments. If built correctly, such case studies would increase the understanding of the Smart $aver® program by customers in different market segments because they would have examples to which they can relate, lowering the perceived risk and uncertainty for new participants.

4. Duke Energy should explore the feasibility of developing a coordinated marketing campaign for one market segment, implementing it as a pilot, and evaluating its effectiveness. A small pilot would allow Duke Energy to assess whether targeting marketing to one segment would be a more effective approach for future program efforts.

5. Duke Energy and WECC should jointly share and discuss their technology selection processes. This would allow both parties to better provide feedback in order to make accurate estimates of market activity. This would also allow both Duke Energy and WECC to explain, if the trade allies ask, why certain technologies are not included.

6. WECC should provide timely feedback to Duke Energy about whether they believe the projected market activity levels provided by Duke Energy are realistic, based upon WECC's experience in the field. This would allow Duke Energy to use WECC's direct experience in the field to relay any upcoming customer purchasing trends.

7. If poor economic conditions are expected to impact customers' ability to take on retrofit projects, and if there is enough spread among the energy efficiency levels of equipment available to make offering multiple levels of efficiency a viable option, Duke Energy

should assess whether it is feasible to test a tiered prescriptive program that would allow customers to still install energy efficient technologies when the highest efficiency models are priced out of their current means. However, Duke Energy should not trade off higher levels of free ridership in exchange for increased participation in a program that achieves lower levels of energy savings. It is possible that cost per achieved net kWh would be increased under such an offer depending on how the market would respond.

8. Explore whether it is feasible to create marketing and outreach campaigns that focus on lifecycle costs. This may allow customers to look beyond consideration about a measure’s capital cost and its incentive, and understand the energy savings that would be delivered over the measure’s effective useful life.

9. Make the template for itemizing invoices available online. This guidance would allow trade allies and customers to send in more accurate applications that would be rejected less frequently and could be processed more quickly and cost effectively, without WECC needing to contact applicants for missing information.

10. Duke Energy should consider conducting usability studies and satisfaction surveys of the online application process. This may allow Duke Energy to quantify any reduction in application speed and any increase in customer satisfaction with the application process.

11. Duke Energy should consider the feasibility of designing, implementing, and evaluating a pilot program to help <500 kW customers to prioritize energy efficient projects. This may allow more Duke Energy customers to achieve greater savings by providing them with a more complete picture of their energy efficiency options.

12. Duke Energy should consider the potential benefits of increased market segment penetration if marketing were structured to specifically focus on barriers for a particular key market segment. Duke Energy may want to do this by identifying one high priority market and conducting a characterization study about that market. Duke Energy might then identify that market’s specific barriers to participation and develop a logic model that specifies a strategic approach toward overcoming those barriers. Duke Energy can then evaluate the effectiveness of the approach at the end of the program cycle. This would allow Duke Energy to see if they would be able to successfully drive greater activity in a particular segment if there arose a need for doing so in the future.

Non-Residential Smart $aver® Marketing Approach: Smart Buildings Advantage

This evaluation reviews the Company's marketing approach for promoting greater participation in its Non-Residential Smart $aver Custom and Prescriptive programs. The Phase 1 evaluation was done to examine why people respond to the proposed approach and to provide early feedback to Duke Energy on any customer issues that arose. The report was finalized on March 1, 2011 and is filed as "**Ossege Exhibit C – Non-Residential Smart $aver Marketing Approach: SBA**".

The report contains recommendations provided by the prospective Non-Residential Smart $aver participants, but not by TecMarket Works as this was not a process evaluation. The full process evaluation (Phase 2) will examine the issues and participants' recommendations and will include evaluator recommendations.

Residential Smart $aver® CFL Program

This evaluation report was finalized on June 29, 2010. The full report is filed as "**Ossege Exhibit A - Smart $aver CFLs** ".

Evaluation Contractor's Recommendations for Duke Energy to Consider

The following program recommendations are provided by TecMarket Works and BuildingMetrics, the independent evaluation contractors.

1. Consider conducting light logger studies at different times of the year to observe the daylight effect.

2. Link light logger installations unambiguously to self-reported hours of use data.

3. Continue use of targeted marketing efforts to identify customers most likely to purchase CFLs during the specific promotion or campaign. 2008 targeted messaging analysis shows that targeting messages to customers based on likelihood of adoption is successful in providing lift to populations that were not as likely to purchase CFLs. (Note: during the drafting of this report Duke Energy has continued testing motivational message content and redemption rates and reports that they have narrowed the messaging to energy and environmental appeals that experience the higher adoption and redemption rates and have moved to the use of free product coupons that together are substantially increasing redemption rates for CFLs.)

4. Savings for typical CFL bulbs may decrease over the long term as more customers adopt CFLs and continue to install bulbs in lower use sockets and fixtures. Recognizing the need to cost-effectively distribute CFLs, Duke Energy designed a tracking system to mitigate over-distribution of traditional CFLs. Consider transitioning the CFL program to incorporate other types of CFL offers, such as specialty bulbs (candelabras, torchieres, outdoor, etc.), LEDs, and other emerging technologies as they become cost effective. (Evaluation Review Follow-Up Note: Duke Energy reports that they are currently examining the inclusion of specialty bulbs to understand their potential with both past CFL redeemers and previous purchasers of CFLs as well as approaches for reaching new customers with specialty bulb appeals and offers. In addition, TecMarket Works is currently assessing the market for CFLs and will address the potential for specialty bulbs in the CFL potentials report to be delivered in April 2011. Duke Energy also reports that CFL adoption has increased due to offering web and phone-based ordering platforms where CFLs can be shipped directly to the customer's home as soon as they are ordered. Duke Energy customers can check eligibility and request CFLs by accessing a unique URL or OLS (Online Services) or by calling a toll-free number.

5. Consider incorporating a market effects study to identify ways to transition the program moving forward as traditional incandescents are phased out in the coming years, as shown in Table 1 below.

Table 1. EISA Schedule for General Service Incandescent[1]

Current Wattage	Rated Lumen Ranges	Maximum Rated Wattage	Minimum Rated Lifetime	Effective Date (Manufactured on or after)
100	1490-2600	72	1,000 hours	1/1/2012
75	1050-1489	53	1,000 hours	1/1/2013
60	750-1049	43	1,000 hours	1/1/2014
40	310-749	29	1,000 hours	1/1/2014

6. Consider coupling CFL efforts with other energy saving measures and/or programs. Customers did not buy many other energy efficiency items in addition to the CFLs when making their CFL purchases. Program managers could leverage both redeemer and non redeemers' awareness of ENERGY STAR to incorporate other energy saving items and/or encourage customers take other energy saving actions at the same time they are purchasing CFLs. Coupon redeemers purchased other energy saving measures (caulking, weather stripping, low-flow showerhead) in small quantities and might be interested in other simple energy saving measures if they were co-marketed with a CFL offer. Both redeemers and non redeemers may be interested in such measures as ENERGY STAR appliances, or other Duke Energy programs offering energy efficient measures such as HVAC or home audits. (Evaluation Review Follow-Up Note: Duke Energy reports that they have already started coordinating program services to include multi-product appeals and exposure in their small business programs, the Home Energy House Call program, neighborhood canvassing, and are considering other programs that can act as aggregation efforts to expose customers to multiple measures.)

7. Non coupon redeemers are generally not influenced by receiving Duke Energy coupons to purchase CFLs elsewhere, however, the price of CFLs is a factor for these customers. Consider additional marketing strategies for these customers that incorporate the Duke reduced price of CFLs, recommendations of friends and family, and other types of advertising appeals. These customers were more influenced by in-store advertising than the coupon redeemers, so other types of offers for CFL savings, such as point of purchase offers, may appeal to these customers. (Evaluation Review Follow-Up Note: Duke Energy reports that they have started these efforts with property management programs, business reply cards and web campaigns.)

[1] Source:
http://www1.eere.energy.gov/buildings/appliance_standards/residential/pdfs/lighting_legislation_fact_sheet_03_13_08.pdf

Current Evaluation Activities

Energy Solutions @ Home (Residential Assessments Retrofit)

This process evaluation report is currently being drafted.

Energy Efficiency Education Program for Schools

This evaluation report is currently being drafted. The draft report is due to Duke Energy during the second quarter for Process evaluation, and early in the 3rd quarter for Impact evaluation..

Home Energy Comparison Report (SC Pilot)

This evaluation report is currently being drafted. The draft report is due to Duke Energy during the second quarter.

Residential Energy Assessments: Home Energy House Call

This draft evaluation report is in review by Duke Energy to be finalized second quarter.

Non-Residential Energy Assessments

The draft report for the 2009-2010 program is in progress, with a draft report due date of March 31, 2011. This report was scheduled (in March of 2009) to be completed in Q2-Q3 2010, but the evaluation was delayed due to low participation in the program.

Non-Residential Smart $aver® Custom

This evaluation is currently being conducted on an ongoing basis as customers become participants. The 2010 report was scheduled (in March of 2009) to be completed in Q2-Q3 2010, but the evaluation was delayed due to low participation in the program. This evaluation is now planned to be completed in Q2 of 2011.

Residential Energy Assessments: Personalized Energy Report and Energy Efficiency Website

This evaluation report is currently being drafted. The draft report is due to Duke Energy by the second quarter.

Power Manager®

This draft evaluation report is in review by Duke Energy.

PowerShare®

This draft evaluation report is in review by Duke Energy.

Residential Smart $aver® Impact Evaluation

The impact report was delayed from the planned delivery date of Q1 in 2010 because of incomplete submetering spreadsheets discovered when the impact evaluation began. The impact evaluation was further delayed due to the need for a more in-depth (customer by customer) review of impacts. This is scheduled to be completed by April 15, 2011.

Planned Evaluation Activities

Energy Solutions @ Home Pilot Program

The process evaluation includes program manager interviews to assess program operations, and participant and nonparticipant surveys to assess program awareness, satisfaction, barriers to participation, and energy efficiency actions taken. This program in its current pilot design may not be extended through 2011-2012, so there is no impact evaluation planned for this program at this time.

Energy Solutions @ Home	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments were developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and will be sent to the interviewees before the interview for their review.	Q1 2011
Conduct Interviews – These interviews will be done over the phone.	Q1 2011
Participant and Non Participant Surveys	Q1 2011
Instrument Development – Survey instruments were developed by TecMarket Works and Duke Energy Market Analytics staff, reviewed by TecMarket Works and Duke Energy Market Analytics staff.	Q1 2011
Conduct Surveys – These surveys will be conducted by phone.	Q1 2011
Analysis	Q1 2011
Reporting	Q1 2011
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q2 2011

Energy Efficiency Education Program for Schools

The process evaluation will include program manager, implementer and teacher interviews to assess program operations, and student family surveys to assess program awareness, satisfaction, and compliance with installations and recommendations. The impact evaluation will consist of engineering estimates and billing analysis.

K12 Curriculum	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments to be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews will be done on-site or over the phone.	Q2 2011
Interview Teachers	
Instrument Development – Interview instruments were developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews will be conducted over the phone.	Q2-Q4 2011
Student Family Surveys	
Instrument Development – Survey instruments will be developed by TecMarket Works and Duke Energy.	Q2 2011
Conduct Surveys – These surveys will be mailed.	Q2-Q4 2011
Analysis	Q1 2012
Reporting	Q2 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q3 2012
Impact	
Engineering Estimates	Q1 2012
Billing Analysis – A statistical billing analysis of program participants will be conducted and compared to the engineering estimates.	Q2 2012
Reporting	Q2 2012

Home Energy Comparison Report(SC Pilot)

The 2012 program process evaluation will include program manager and implementer interviews to assess program operations, and participant surveys to assess program awareness, recall, and satisfaction. The impact evaluation will include a billing analysis.

Home Energy Comparison Report	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2012
Conduct Interviews – These interviews will likely be done over the phone, but may be held on-site at Duke Energy offices.	Q3 2012
Participant Surveys	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q2 2012
Conduct Surveys – These surveys will be done over the phone.	Q2-Q4 2012
Analysis	Q4 2012
Reporting	Q3 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q1 2013
Impact	
Billing Analysis – A statistical billing analysis of program participants will be conducted and compared to the engineering estimates.	Q1 2013
Reporting	Q1 2013

Residential Energy Assessments: Home Energy House Call

The process evaluation will include program manager and implementer interviews to assess program operations, and participant surveys to assess program awareness and satisfaction. The impact evaluation will be done via billing analysis.

Home Energy House Call	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2-Q3 2011
Conduct Interviews – These interviews will likely be done over the phone, but may be held on-site at Duke Energy offices.	Q1 2012
Participant Surveys	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q2-Q3 2011
Conduct Surveys – These surveys will be done over the phone.	Q1 2012
Analysis	Q2 2012
Reporting	Q2 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q2-Q3 2012
Impact	
Billing Analysis – A statistical billing analysis of program participants will be conducted and compared to the engineering estimates.	Q4 2012
Reporting	Q4 2012

Residential Energy Assessments: Home Energy Manager (Pending Approval)

The process evaluation will include program manager and implementer interviews to assess program operations, and participant surveys to assess program awareness and satisfaction. The impact evaluation will be done via billing analysis.

Home Energy Manager	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews will likely be done over the phone, but may be held on-site at Duke Energy offices.	Q2 2011
Participant Surveys	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q2-Q3 2011
Conduct Surveys – These surveys will be done over the phone.	Q3-Q4 2011
Analysis	Q1 2012
Reporting	Q2 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q2 2012
Impact	
Billing Analysis – A statistical billing analysis of program participants will be conducted and compared to the engineering estimates.	Q3-Q4 2011
Reporting	Q4 2012

Low Income Energy Efficiency and Weatherization Assistance Program

The process evaluation will include program manager and CAP staff interviews to assess program operations, and participant surveys to assess program satisfaction for the Agency Assistance Kits and the Refrigerator Replacement Low Income programs. The impact evaluation will consist of a billing analysis and engineering estimates.

Low Income	Timing
Process	
Interview Program Managers and Implementers (CAP staff)	
Instrument Development – Interview instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews will likely be done over the phone, but may be held on-site at Duke Energy offices.	Q2-Q3 2011
Participant Surveys	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q3 2011
Conduct Surveys – These surveys will be done over the phone.	Q3-Q4 2011
Analysis	Q4 2011
Reporting	Q1 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q1 2012
Impact	
Billing Analysis – A statistical billing analysis of program participants will be conducted and compared to the engineering estimates.	Q3-Q4 2012
Engineering Estimates – Engineering estimates of savings will be developed for CFL use identified through the participant surveys. Average savings per participant based on self-reported efficiency actions will be calculated.	Q3-Q4 2012
Reporting	Q4 2012

Non-Residential Energy Assessments

The 2011 process evaluation will include program manager and implementer interviews to assess program operations, and participant surveys to assess program awareness, satisfaction, and compliance with recommendations. The impact evaluation will include engineering estimates and billing analysis.

Non-Res Energy Assessments	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments were developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q3 2011
Conduct Interviews – These interviews will be done on-site and/or over the phone.	Q3 2011
Participant Surveys	
Instrument Development – Survey instruments were developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q3 2011
Conduct Interviews – These surveys will be done over the phone.	Q3 2011
Analysis	Q4 2011
Reporting	Q1 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q2 2012
Impact	
Engineering Estimates	Q4 2011
Billing Analysis – Engineering estimates of savings by participant will be incorporated into a statistically adjusted engineering (SAE) billing analysis to calculate the energy savings realized in customer bills.	Q4 2011
Analysis	Q4 2011
Reporting	Q1 2012

Non-Residential Smart $aver® Custom

The process evaluation includes program manager and implementer interviews to assess program operations, and participant surveys to assess program awareness, satisfaction, and equipment replacement, and end-use persistence. The impact evaluation will include selective, short term monitoring and building simulation modeling as appropriate.

Non-residential Smart $aver® Custom	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments to be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews	Q4 2011
Participant Surveys – These interviews will be done over the phone.	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q2 2011
Conduct Interviews	Q2 2011 - Q2 2012
Interview Program Vendors	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q2 2011
Conduct Interviews	Q2 2011 - Q2 2012
Analysis	Q2 2011 - Q2 2012
Reporting	Q2 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q3 2012
Impact	
Selective monitoring. Pre and post-installation monitoring conducted at sites installing lighting, HVAC, and process equipment to verify baseline equipment and operations.	Q2 2010 - Q1 2012
Data Cleaning. Data from monitoring.	Q2 2010 - Q1 2012
Engineering Estimates Engineering models will be developed using pre/post data to estimate savings after post-installation data collection is complete.	Q1 2012
Building Simulation Modeling. Calibrated DOE-2 simulation models will be run at selected sites to estimate savings for projects where pre/post monitoring is not appropriate. This process will be invoked as customer participation rates increase, and for primarily new construction projects.	Q1 2012
Reporting	Q2 2012

Non-Residential Smart $aver® Prescriptive

The process evaluation includes program manager and implementer interviews to assess program operations, and participant surveys to assess program awareness, satisfaction, equipment replacement, and end-use persistence. The impact evaluation includes short term monitoring and engineering estimations.

Non-Residential Smart $aver® Prescriptive Incentives	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews were conducted on-site and over the phone.	Q3 2011
Participant Surveys	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q3 2011
Conduct Interviews – These surveys were done over the phone.	Q3-Q4 2011
Interview Program Vendors	
Instrument Development – Interview instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q3 2011
Conduct Interviews – These interviews would be done over the phone.	Q3-Q4 2011
Analysis	Q1 2012
Reporting	Q2 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q3 2012
Impact	
Selective monitoring – Monitoring of occupancy sensors and linear fluorescents will be conducted in 2011.	Q2-Q4 2011
Engineering Estimates – Engineering estimates of monitored data	Q1 2012
Reporting	Q2 2012

Residential Energy Assessments: Personalized Energy Report and Energy Efficiency Website

The process evaluation will include program manager and implementer interviews to assess program operations, and participant surveys to assess program satisfaction. The impact evaluation will consist of a billing analysis and engineering estimates.

Personalized Energy Report	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q3 2011
Conduct Interviews – These interviews will likely be done over the phone, but may be held on-site at Duke Energy offices.	Q3 2011
Participant Surveys	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q3 2011
Conduct Surveys – These surveys will be done over the phone.	Q3-Q4 2011
Analysis	Q1 2012
Reporting	Q2 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q3 2012
Impact	
Billing Analysis – A statistical billing analysis of program participants will be conducted and compared to the engineering estimates.	Q3-Q4 2012
Engineering Estimates – Engineering estimates of savings will be developed for efficiency actions identified through the participant surveys. Average savings per participant based on self-reported efficiency actions will be calculated.	Q3-Q4 2012
Reporting	Q4 2012

Power Manager®

The process evaluation includes program manager and implementer interviews to assess program operations, and participant and nonparticipant surveys to assess program awareness, satisfaction, and energy-related behaviors. The impact evaluation includes whole house metering, spot metering, and data logger analysis. In addition, event-specific surveys will be conducted to measure customer awareness of and comfort during an event from a random sample of customers with canon switches (who have not participated in previous M&V efforts) within 48 hours after a peak event.

Power Manager®	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments were developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q1 2011
Conduct Interviews – These interviews were done over the phone.	Q2 2011
Participant Surveys	
Survey Development – Survey instruments will be developed by TecMarket Works and Duke Energy.	Q1-Q2 2011
Conduct Surveys – These surveys will be done by phone with a sample of participants within 48 hours of events.	Q2-Q3 2011
Analysis	Q4 2011
Reporting	Q1 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q2 2012
Impact	
Whole-house metering on random sample. – Whole premise interval meters installed on a sample of Power Manager participants.	Q2-Q3 2011
Time-series framework – to estimate baseline energy usage. The interval data will be analyzed to estimate load reductions during control events.	Q4 2011
Spot metering and data logger samples during peak season. – Data loggers installed at a sample of participant sites to estimate the fraction of units responding to the demand signal. Spot metering used to estimate the connected load of the controlled units.	Q2-Q3 2011
Analysis of Data	Q1 2012
Reporting	Q2 2012

PowerShare®

The process evaluation will include program manager interviews to assess program operations. The impact evaluation will include time-series regression analysis of interval demand data, analysis of system operations.

PowerShare®	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments to be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q3 2011
Conduct Interviews – These interviews will be done over the phone.	Q3-Q4 2011
Participant Surveys	
Instrument Development – Survey instruments were developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q3 2011
Conduct Surveys – These interviews will be done over the phone.	Q3-Q4 2011
Analysis	Q1 2012
Reporting	Q1 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q2 2012
Impact	
Time-series regression analysis. Interval data collected at PowerShare sites were entered into time series regression model to estimate the impacts resulting from load control events.	Q3-Q4 2011
Observations of compliance (analysis of system operations data) Interval data were used to determine if customers are complying with terms of their load control agreements.	Q3-Q4 2011
Reporting	Q4 (2011) -Q1 2012

Residential Smart $aver®

The process evaluation will include program manager and implementer interviews to assess program operations, participant surveys to assess program awareness, satisfaction, equipment replacement, and end-use persistence, and non-participant interviews to the reasons for not participating. The impact evaluation will include an engineering walk through; short term monitoring, building simulation modeling as appropriate.

Residential Smart $aver®	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews will be done on-site or over the phone.	Q3 2011
Participant Surveys	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q3 2011
Conduct Interviews – These surveys will be done over the phone.	Q3 2011
Non-Participant Surveys	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q3 2011
Conduct Surveys – These surveys will be done over the phone.	Q3-Q4 2011
Interview Program Vendors	
Instrument Development – Survey instruments will be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff and the program manager before being fielded.	Q3 2011
Conduct Surveys – These surveys would be done over the phone.	Q3-Q4 2011
Analysis	Q4-Q1 2012
Reporting	Q2 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q2 2012
Impact	
Selective monitoring. Pre/post monitoring of whole HVAC systems. These data will be used to inform the DOE-2 simulation models	Q2 2012
Site visits. Duke staff will conduct site visits at a sample of sites to verify unit installation and gather building characteristics data.	Q2 2012
Data Cleaning. Monitored data from whole HVAC systems will be analyzed and prepared for the engineering analysis.	Q3 2012
Engineering Estimates. Building characteristics data from the verification surveys, and the data from the monitoring sample will be used to develop and calibrate a series of prototypical DOE-2 models representing a range of building ages and operating modes.	Q3 2012
Building Simulation Modeling. The calibrated DOE-2 simulation models will be run using long term average weather data for Carolinas;	Q3 2012

Savings will be calculated for air conditioners, heat pumps, and dual fuel heat pumps from SEER 14 to SEER 18. Savings from the models will be assigned to program participants according to their location, system type and system efficiency.	
Billing Analysis. Engineering estimates of savings by participant will be incorporated into a statistically adjusted engineering (SAE) billing analysis to calculate the energy savings realized in customer bills.	Q3-Q4 2012
Reporting	Q4 2012

Non-Residential Smart $aver Marketing Approach: Smart Buildings Advantage

Phase 1 of this evaluation is complete.

Phase 2 of this evaluation consists of commercial participant interviews. Interviews will be conducted both over the phone and on-site as in-depth exploratory interviews to identify reasons for engagement, expectation of results, how the approach and its associated processes integrate with the customer's needs/expectations and will assess the ability of Duke Energy to serve a valued and cost effective service.

Smart Buildings Advantage Program	Timing
Process	
Interview Program Participants	
Instrument Development – Interview instruments to be developed by TecMarket Works and will be reviewed by Duke Energy, and will be sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews will be done on site or over the phone.	Q2-Q4 2011
Analysis	Q1 2012
Reporting	Q2 2012
Impact	
Selective monitoring – Monitoring of systems affected by program will be conducted. Trend data from building automation systems will be supplemented by data loggers as necessary.	Q2-Q4 2011
Engineering Estimates – Engineering estimates of monitored data	Q1 2012
Reporting	Q2 2012

Residential Smart $aver® CFLs

Also referenced as "Residential Smart $aver Energy Start Products". The process evaluation includes program manager and retail site interviews to assess program operations, and participant and nonparticipant surveys to assess program awareness, satisfaction, and use/storage of CFLs. The impact evaluation includes participant surveys as well as lighting logger data collection and analysis.

Smart $aver® CFLs	Timing
Process	
Interview Program Managers and Implementers	
Instrument Development – Interview instruments to be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews to be done over the phone.	Q2 2011
Interview Retail Managers	
Instrument Development – Interview instruments to be developed by TecMarket Works, reviewed by Duke Energy Market Analytics staff, and sent to the interviewees before the interview for their review.	Q2 2011
Conduct Interviews – These interviews to be done over the phone.	Q2 2011
Participant and Non Participant Surveys	
Instrument Development – Survey instruments will be developed by TecMarket Works and Duke Energy Market Analytics staff, reviewed by TecMarket Works and Duke Energy Market Analytics staff. Some surveys will be mailed to participants and non participants, some surveys will be conducted by phone.	Q1-Q2 2011
Surveys – These surveys will be conducted by phone and through mail.	Q2-Q4 2011
Analysis	Q1-Q2 2012
Reporting	Q2 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q3 2012
Impact	
Lighting logger metering on random sample. – Lighting loggers installed on fixtures in homes of a sample of CFL program participants.	Q3-Q4 2012
Analysis of Data	Q3-Q4 2012
Reporting	Q4 2012
Duke reviews and addresses report recommendations, enters them into database for resolution.	Q1 2013

<u>Overview of Duke Energy Carolinas' EM&V Plans for 2012</u>

Duke Energy Carolinas' evaluation, measurement, and verification ("EM&V") plan for its North Carolina demand-side management ("DSM") and energy efficiency ("EE") programs in 2012 is consistent with the plan approved in the Commission's February 26, 2009 *Order Resolving Certain Issues, Requesting Information on Unsettled Matters, and Allowing Proposed Rider to Become Effective Subject to Refund* in Docket No. E-7, Sub 831. TecMarket Works, was selected to be the Company's evaluation contractor and is the designer, manager, and supervisor of these evaluations. Evaluations of DSM and EE programs will be based on engineering projections of savings, as well as actual field evaluations, metering, monitoring, and other generally accepted EM&V activities. These evaluations will be consistent with industry best practices, including the California Evaluation Protocols and the International Performance Measurement and Verification Protocol ("IPMVP"). Duke Energy Carolinas intends to verify all programs by sampling approximately 5% of installed measures from each, focusing on high-savings and high-priority measures in order to ensure high-quality results. The anticipated evaluation schedule and estimated budget for 2012 are presented in the table below and reflect Duke Energy Carolina's ramping activity in EE and DSM:

Program Name	**Estimated 2012 Process Reporting**	**Estimated 2012 Impact Reporting**	**Estimated 2012 Budget $000**
Residential Energy Assessments - Home Energy House Call	Q2	Q4	$60
Residential Energy Assessments - Energy Efficiency Website	Q2	Q4	$50
Residential Energy Assessments - Personalized Energy Report	Q2	Q4	$35
Residential Smart $aver®	Q2	Q4	$90
Residential Smart $aver® Energy Star Products	Q2	Q4	$200
Low Income Energy Efficiency and Weatherization Assistance Program	Q1	Q4	$30
Energy Efficiency Education Program for Schools	Q2	Q2	$35
Home Energy Comparison Report (SC Pilot)	Q3	Q1 (2013)	$80
Power Manager	Q1	Q2	$150
Non-Residential Energy Assessments	Q1	Q1	$50
Non-Residential Smart $aver®	Q2	Q2	$480

Non-Residential Smart $aver® Marketing Approach (SBA)	Q2	Q2	$70
Smart Energy Now (NC Pilot)	Q3	Q4	$250
PowerShare®	Q2	Q4 (2013)	$50
Annual Evaluation Summary	Q4 2012 and Q1 2013		$30
Equipment and Metering Services	Ongoing	Ongoing	$90
Surveying and Misc Subcontracting	Ongoing	Ongoing	$140
Ongoing Cost Effectiveness Analyses	Ongoing	Ongoing	$110
Project Management	Ongoing	Ongoing	$130
Total			**$2,130**

Residential Programs/Measures

Residential Energy Assessments:

Home Energy House Call is an energy audit program. The program provides a report to the occupant recommending energy savings measures for their home. The service also provides measures that can be directly installed in the home, such as compact fluorescent light bulbs ("CFLs") and weather stripping. Program impacts will be computed using an engineering-based estimation of energy savings for the installed measures, in conjunction with a more robust statistical assessment of energy use differences (savings) for the period of time before and after recommendations have been made. The post-retrofit period occurs after participants have had time to install the measures provided and/or to follow up on the auditor's recommendations regarding additional measures. Customer surveys will be conducted to determine whether there were changes in household occupancy and to ascertain which of the recommended energy savings measures were implemented by the customers one to twelve months following the audit. The focus of the impact assessments will be on kWh savings more than kW, given the complexity and variety of possible measures and energy savings recommendations. Customer surveys will also gather information related to free ridership and customer satisfaction with the audit and the auditor. A process evaluation of this program will be conducted in 2012. This evaluation plan is consistent with IPMVP.

Energy Efficiency Website provides customers with an online home audit tool to reduce energy consumption. The impact evaluation study will utilize engineering-based estimates that are informed by user survey data. Participant surveys following up with customers one to twelve months after the website visit will collect information on EE actions taken as a result of the tool (as well as potential channeling effects to other programs), changes in household occupancy, prior knowledge of the measures, future intentions to install measures, and retention and satisfaction with the tool. A process evaluation of this program will be conducted in 2012. The IPMVP protocol is not applicable in this case.

Personalized Energy Report provides a customized usage analysis, personalized for a customer's home and usage characteristics, in a mailed or online form. Previous experience with statistical billing analysis results suggests that this approach is possible to uncover estimates of energy savings. In addition to a billing analysis, engineering-based estimates of savings will be developed, informed by survey data. The participant surveys will gather information on EE actions taken, prior knowledge of these measures, intentions, changes in other end uses including changes in household occupancy, persistence of savings and program satisfaction. A process evaluation of this program will be conducted in 2012. This evaluation plan is consistent with IPMVP.

Residential Smart $aver®

Residential Smart $aver® rebate program provides incentives for more efficient HVAC equipment. In some cases, additional CFLs are provided as well. For new construction installations, prototypical customer homes will be modeled using an engineering simulation model designed for residential applications, and pre- and post-measure installation usages will be compared. This evaluation method will be conducted for retrofit applications as well, augmented by a statistical billing analysis. A comparison of estimates derived under the two methods will form the basis for insights into the predictive power of the engineering model. To maximize the estimation power of the billing analysis, a statistically adjusted engineering model will be developed that uses prior engineering estimates as explanatory variables, plus weather normalization and household-specific usage factors. Participant and non-participant surveys will be conducted, along with vendor satisfaction surveys or interviews, to estimate free ridership and uncover potential vendor issues that might impact customer satisfaction or program effectiveness. These surveys will also provide inputs to the statistical adjusted engineering models (*e.g.*, equipment that was replaced, any changes in usage or house occupancy). A process evaluation of this program will be conducted in 2012. This evaluation plan is consistent with IPMVP.

Energy Star Products program focuses on the efficient and cost effective delivery of CFLs through innovative promotional channels. Since savings from this measure type will typically be small relative to total load, impact evaluations must be based on prior engineering-based estimates of kWh savings for the affected categories of lighting. Here, engineering algorithms for the installed lighting measures are reasonably well known and can be adapted to the specific adoption rate of CFLs in North Carolina and potential market effects. Further, the Energy Star program is a widespread and well-studied program, which will allow for additional extrapolation of results from other studies for use in estimation of impacts for this program. Selective short term spot metering will be performed within randomly selected homes to confirm the expected engineering results and to ascertain the wattages of replaced bulbs. In addition, data loggers will be left within some of these homes to monitor the hourly usage patterns for the installed lights. The sampling of homes will be conducted such that results are representative of the participant population at large. Net savings estimation will be based in part using data from surveys for the program. These participant surveys will gather information about lighting products that were replaced, delivery channel satisfaction and effectiveness, free ridership, spillover, persistence and satisfaction. A process evaluation of this program will be conducted annually within the Residential Programs Process Review. This evaluation plan is consistent with IPMVP.

Low Income Energy Efficiency and Weatherization Assistance Program

Current program provides a variety of customized measures installed in customers' homes, based on an on-site assessment of the premises. Due to findings regarding the impact of the flow of Federal Stimulus monies, the focus of the evaluation activities will be on impact analyses. Because savings can be expected to be observable within a billing analysis framework, this approach will be used with pre- and post-participation data. The model will be weather normalized, and the analysis will be informed by survey data. This evaluation plan is consistent with IPMVP Protocol C.

Duke Energy is currently reviewing other approaches to Low Income. The latest anticipated program will target neighborhoods where the majority of the residents are below 200% of the federal poverty guidelines. This Neighborhood Low Income program is being modeled after a program currently being offered by other utilities. A request for proposal was sent to vendors and five proposals have been submitted to administer this program. Proposals are currently under review.

If the new proposed program comes to fruition, the focus of 2012 activities will be on a process analyses and needs assessment. The need for an impact analysis will be determined in the spring or summer 2012 after a review of 2011 program design and operations and program approval. If an impact analysis occurs, savings can be expected to be observable within a billing analysis framework, and this approach will be used with pre- and post-participation data. The model will be weather normalized, and the analysis will be informed by survey data. This evaluation plan is consistent with IPMVP.

Energy Efficiency Education Program for Schools is designed to educate students about EE through EE curriculum, Duke Energy Carolinas' online home audits and on-site school audits. Depending on the results of the 2011 engineering-based estimates and billing analysis of kWh savings, the evaluator will consider repeating the engineering estimates and billing analysis. In addition, surveys of teachers regarding their perception of retention of information by students and program satisfaction will be conducted. Independent process evaluation review through feedback from teachers will continue, particularly to monitor improvements as the partner relationship matures. Duke intends to carefully segregate claimed impacts from only those respondents that are Duke Energy customers.

Power Manager® provides financial incentives to customers for the periodic cycling of appliances during super peak hours. The program is designed to induce temporary reductions in usage that would not normally persist beyond one day. As such, the focus of the impact evaluation will necessarily be the measurement and evaluation of short-term hourly changes in load due to the appliance cycling activity. Whole-house metering will be conducted on a randomly selected or stratified sample (stratified by usage and geography). This metered data will be analyzed within a statistical time-series framework to establish an estimate of “baseline” energy usage. The baseline will capture demand patterns in the absence of the program. This will be compared to an analysis of loads in a statistical model that will be constructed to isolate the effect of the program. Due to the characteristics of the customers in the program, it is likely that a statistical model can and will be developed for each customer. However, the data will be pooled when appropriate to take advantage of any gains from data pooling or aggregation. In addition, spot metering and data logger samples will be taken during the peak season to confirm and bolster the estimated savings derived from the whole-house metering study. Data loggers and instantaneous demand measures can be done quickly and reasonably cost effectively. This means increased precision of the load reduction estimates to bolster the base sample of whole-house metered loads. Participant and non-participant surveys will be conducted to ascertain customer comfort, natural thermostat settings, program satisfaction, vendor satisfaction, and related issues. There is no free ridership to be estimated, in this case, since the estimation of the natural duty cycle of the appliances implicitly accounts for what would have happened in the absence of the program. A process evaluation study will be conducted in 2012 and will include the review of load reduction estimates, as well as operational use of the resource within system operation contexts on peak and customer satisfaction. This evaluation plan is consistent with IPMVP.

The **Home Energy Comparison Report** is a pilot program in South Carolina and is designed to provide participants with information about their household energy consumption and provide seasonally appropriate tips on how to reduce their energy consumption. Billing analysis will be used to estimate the impacts of the program, as well as provide insights as to optimal frequency of feedback. A process review will be conducted to learn from the participants' experiences.

Non-Residential Programs/Measures

Non-Residential Energy Assessments provide education and outreach to commercial customers. There are three components—an on site option, an online version and a phone version. For these participants, savings are anticipated to be large enough relative to total load that billing analysis should reveal savings from actions taken as a result of the program. Surveys will be conducted to understand EE actions taken, prior intentions regarding these measures, changes in electric-using technologies or operations that impact usage, persistence of savings and program satisfaction. Process review will occur within the C&I Program Process Review, including an assessment of the programs function as a feeder program. This evaluation plan is consistent with IPMVP.

Non-Residential Smart $aver Prescriptive Incentive Program offers a combination of incentives for various measures primarily related to lighting, HVAC and motors. Here, random samples of participants will be selected for review and impact estimation studies. For each, some blend of selective monitoring and site visits will be performed at a small sample of facilities, with engineering-based estimation and participant billing analysis of a larger group, where feasible. Participant surveys will be conducted to collect information needed to estimate net impacts. Participants will be asked about equipment that was replaced, energy efficiency actions taken, prior intentions regarding these measures, changes in other major end uses that impact energy consumption, hours of facility operation, persistence and program satisfaction. A process evaluation will be included in 2012 activities. This evaluation plan is consistent with IPMVP Protocols.

Non-Residential Smart $aver Custom Incentive Program offers incentives to customers for proposing unique energy savings opportunities that fit their site needs that are not covered within the prescriptive incentive program. Expenditures for this evaluation may vary depending on the specific measures adopted by customers. The program will use selective monitoring (data loggers, site visits, engineering-based estimation, building simulation modeling and single participant billing analysis). As is consistent with evaluation best practices, the measures selected for direct evaluation will focus on higher impact measures. Consistent with the approved M&V plan 5% of the installed measures will be field verified. Participant surveys will be conducted to collect information on prior intentions regarding equipment that was replaced, changes in other major end uses that impact energy usage, potential spillover, changes in hours of operation, persistence and program satisfaction. A process review will be conducted within the overall C&I Program Process Review. This evaluation plan is consistent with IPMVP Protocols.

The **Smart Energy Now** program is a pilot program comprised of a combination of program elements, including: 1) A Behavioral Pilot Program which is designed to create energy and capacity reductions through behavioral modifications, 2) A Fault Detection Diagnostics pilot program that will capture savings via a fault monitoring and response approach similar to a retro-commissioning effort to capture savings as system operations and set point faults are detected and recommendations for changes are made and implemented. A two building pilot of this approach is planned, and 3) coordination with existing Duke Energy Smart $aver prescriptive and custom rebate programs to encourage the installation of energy efficient measures as appropriate. The process evaluation will focus on assessing the design and implementation approach for the program in order to make recommendations for changes that can be expected to improve the impacts from or operational efficiency of the program. The impact evaluation will examine the savings associated with the behavior changes made by program participants and the savings achieved by coordination with the Smart $aver Prescriptive and Custom rebate programs. The current budget for SEN is under review given recent direction from the Commission to expand M&V.

Power Share® provides financial incentives to large customers to reduce electricity use during critical control periods as determined by MISO or Duke Energy Carolinas. Since this program entails direct payment to the customer soon after an event, Duke Energy Carolinas conducts internal impact evaluations of this program. The program is designed to induce temporary reductions in usage that are not be expected to persist beyond the event. The evaluation will measure short-term hourly changes in load due to the interruption of activity. Given the MW savings attributable to this program, reasonably robust and precise time-series based statistical regression analysis will be applied to hourly metered load to obtain the best estimate of the load reduction (assuming the program is called in the referenced year). In addition, observations of compliance with interruption requests will be measured through system operations data, to confirm the individual findings for each customer. Therefore, each participant's hourly loads will be analyzed annually. This metered data will be analyzed within a statistical time-series framework to establish an estimate of the "baseline" energy usage. The baseline refers to customer demand patterns without the influence of the program, given the weather conditions or other local phenomena consistent with the interrupted day. This will be directly compared to actual loads within the statistical model to isolate the effect of the program. Since all of these participants already have hourly metered load, no additional metering is necessary. Where load reductions are too small relative to the metered load, sub-metering installations will be considered. This evaluation plan is consistent with IPMVP.

Duke Energy Carolinas
Non Residential Lost Revenues June 2009-August 2009

Total OPT Jun 09 - Aug 09

	On Peak kWh	Off Peak Kwh	
OPT I	2,359,876,570	7,974,827,712	10,334,704,282
OPT G	2,901,557,633	9,465,193,648	12,366,751,281
Rate OPT I	2.4853	0.6836	
Rate OPT G	2.8829	0.9135	
Total	5,261,434,203	17,440,021,360	22,701,455,563
OPT I	0.44852344	0.457271671	
OPT G	0.55147656	0.542728329	
	2.7046	0.8084	
On vs. off	0.231766381	0.768233619	
Average	**1.2479**		

Removal Of Fuel Cost Adj from Base Rates	
GS/Lighting	2.191392
Industrial	2.193772

Add Back DSM Deferral from Base Rates	
GS/Lighting	0.0145
Industrial	0.0145

Duke Energy Carolinas
Residential Lost Revenues June 2009-August 2009

	Total Residential Jun 09 - Aug 09			
kWh Sales	July-Oct	Nov-June		
RE	2,983,530,418	6,833,925,078		9,817,455,496
RS	5,049,108,520	7,850,953,860		12,900,062,380
Percent of Sales				
RE	30.390%	69.610%		
RS	39.140%	60.860%		
RE Rates				
First 350 kWh	7.6897	7.6897		7.6897
Over 350 kWh	7.7222	6.9452		7.1813
RS Rates				
First 350 kWh	7.6897	7.6897		7.6897
Over 350 kWh	7.9501	7.8742		7.9039
kWh per tier				
RE First 350 kWh	843,740,266	1,682,374,109		2,526,114,375
RE Over 350 kWh	2,139,790,152	5,151,550,969		7,291,341,121
kWh per tier				
RS First 350 kWh	1,262,861,281	2,482,221,969		3,745,083,250
RS Over 350 kWh	3,786,247,239	5,368,731,891		9,154,979,130
	First 1000kWh	Over 1000kWh		
RE	2,526,114,375	7,291,341,121	9,817,455,496	
RS	3,745,083,250	9,154,979,130	12,900,062,380	
RE Average	7.6897	7.1813		
RS Average	7.6897	7.9039		
Total	6,271,197,625	16,446,320,251	22,717,517,876	
RE	40%	44%		
RS	60%	56%		
	7.6897	7.5836		
Total kWh	0.27605118	0.72394882		
Average	**7.6129**			
Total of Riders	**(2.1772)**			
Total Res LMR	**5.44**			

Removal Of Fuel from Base Rates	
Residential	2.191703

Add Back DSM Deferral from Base Rates	
Residential	0.0145

Duke Energy Carolinas
Non Residential Lost Revenues September 2009-December 2009

	Total OPT Sep 09 - Dec 09		
	On Peak kWh	Off Peak Kwh	
OPT I	2,359,876,570	7,974,827,712	10,334,704,282
OPT G	2,901,557,633	9,465,193,648	12,366,751,281
Rate OPT I	2.6582	0.8565	
Rate OPT G	3.0542	1.0848	
Total	5,261,434,203	17,440,021,360	22,701,455,563
OPT I	0.44852344	0.457271671	
OPT G	0.55147656	0.542728329	
	2.8766	0.9804	
On vs. off	0.231766381	0.768233619	
Average	**1.4199**		

Removal Of Fuel Cost Adj from Base Rates	
GS/Lighting	2.4286
Industrial	2.4329

Add Back DSM Deferral from Base Rates	
GS/Lighting	0.0145
Industrial	0.0145

Duke Energy Carolinas
Residential Lost Revenues September 2009-December 2009

	Removal Of Fuel from Base Rates
Residential	2.430271

	Add Back DSM Deferral from Base Rates
Residential	0.0145

Total Residential Sep 09 - Dec 09

kWh Sales	July-Oct	Nov-June	
RE	2,983,530,418	6,833,925,078	9,817,455,496
RS	5,049,108,520	7,850,953,860	12,900,062,380
Percent of Sales			
RE	30.390%	69.610%	
RS	39.140%	60.860%	
RE Rates			
First 350 kWh	8.0962	8.0962	8.0962
Over 350 kWh	8.1287	7.3517	7.5878
RS Rates			
First 350 kWh	8.0962	8.0962	8.0962
Over 350 kWh	8.3566	8.2807	8.3104
kWh per tier			
RE First 350 kWh	843,740,266	1,682,374,109	2,526,114,375
RE Over 350 kWh	2,139,790,152	5,151,550,969	7,291,341,121
kWh per tier			
RS First 350 kWh	1,262,861,281	2,482,221,969	3,745,083,250
RS Over 350 kWh	3,786,247,239	5,368,731,891	9,154,979,130

	First 1000kWh	Over 1000kWh	
RE	2,526,114,375	7,291,341,121	9,817,455,496
RS	3,745,083,250	9,154,979,130	12,900,062,380
RE Average	8.0962	7.5878	
RS Average	8.0962	8.3104	
Total	6,271,197,625	16,446,320,251	22,717,517,876
RE	40%	44%	
RS	60%	56%	
	8.0962	7.9901	
Total kWh	0.27605118	0.72394882	
Average	**8.0194**		
Total of Riders	**(2.4158)**		
Total Res LMR	**5.60**		

Duke Energy Carolinas
Non Residential Lost Revenues January 2010 - August 2010

	Total OPT Jan 10- Aug 10		
	On Peak kWh	Off Peak Kwh	
OPT I	2,359,876,570	7,974,827,712	10,334,704,282
OPT G	2,901,557,633	9,465,193,648	12,366,751,281
Rate OPT I	2.8541	0.7331	
Rate OPT G	3.2663	0.9631	
Total	5,261,434,203	17,440,021,360	22,701,455,563
OPT I	0.44852344	0.457271671	
OPT G	0.55147656	0.542728329	
	3.0814	0.8579	
On vs. off	0.231766381	0.768233619	
Average	**1.3733**		

Removal Of Fuel Cost Adj from Base Rates	
GS/Lighting	2.428616
Industrial	2.432857

Add Back CWIP from Base Rates	
GS/Lighting	-0.1129
Industrial	-0.0911

Add Back Nuclear Insurance from Base Rates	
GS/Lighting	-0.0508
Industrial	-0.0410

Add Back DSM Deferral from Base Rates	
GS/Lighting	0.0145
Industrial	0.0145

Add Back Fuel Overcollection from Base Rates	
GS/Lighting	-0.0900
Industrial	-0.0900

Add Back Fuel Cost Adj from Base Rates	
GS/Lighting	0.23153
Industrial	0.23309

Duke Energy Carolinas
Residential Lost Revenues January 2010 - August 2010

		Total Residential Jan 10 - Aug 10		
kWh Sales	July-Oct	Nov-June		
RE	2,983,530,418	6,833,925,078		9,817,455,496
RS	5,049,108,520	7,850,953,860		12,900,062,380
Percent of Sales				
RE	30.390%	69.610%		
RS	39.140%	60.860%		
RE Rates				
First 350 kWh	8.6046	8.6046		8.6046
Over 350 kWh	8.6046	7.794		8.0403
RS Rates				
First 350 kWh	8.6046	8.6046		8.6046
Over 350 kWh	8.6046	8.6046		8.6046
kWh per tier				
RE First 350 kWh	843,740,266	1,682,374,109		2,526,114,375
RE Over 350 kWh	2,139,790,152	5,151,550,969		7,291,341,121
kWh per tier				
RS First 350 kWh	1,262,861,281	2,482,221,969		3,745,083,250
RS Over 350 kWh	3,786,247,239	5,368,731,891		9,154,979,130
	First 1000kWh	Over 1000kWh		
RE	2,526,114,375	7,291,341,121	9,817,455,496	
RS	3,745,083,250	9,154,979,130	12,900,062,380	
RE Average	8.6046	8.0403		
RS Average	8.6046	8.6046		
Total	6,271,197,625	16,446,320,251	22,717,517,876	
RE	40%	44%		
RS	60%	56%		
	8.6046	8.3544		
Total kWh	0.27605118	0.72394882		
Average	**8.4235**			
Total of Riders	**(2.5798)**			
Total Res LMR	**5.84**			

Removal Of Fuel from Base Rates	
Residential	2.430271

Add Back CWIP from Base Rates	
Residential	-0.2083

Add Back Nuclear Insurance from Base Rates	
Residential	-0.0938

Add Back DSM Deferral from Base Rates	
Residential	0.0145

Add Back Fuel Overcollection from Base Rates	
Residential	-0.09

Add Back Fuel Cost Adj from Base Rates	
Residential	0.228119

Duke Energy Carolinas
Non-Residential Lost Revenues September 2010 - December 2010

	Total OPT Sep 10 - Dec 10		
	On Peak kWh	Off Peak Kwh	
OPT I	2,359,876,570	7,974,827,712	10,334,704,282
OPT G	2,901,557,633	9,465,193,648	12,366,751,281
Rate OPT I	2.3886	0.2676	
Rate OPT G	2.7686	0.4654	
Total	5,261,434,203	17,440,021,360	22,701,455,563
OPT I	0.44852344	0.457271671	
OPT G	0.55147656	0.542728329	
	2.5981	0.3749	
On vs. off	0.231766381	0.768233619	
Average	**0.8902**		

Removal Of Fuel Cost Adj from Base Rates	
GS/Lighting	2.363025
Industrial	2.362921

Add Back CWIP from Base Rates	
GS/Lighting	-0.1129
Industrial	-0.0911

Add Back Nuclear Insurance from Base Rates	
GS/Lighting	-0.0508
Industrial	-0.0410

Add Back DSM Deferral from Base Rates	
GS/Lighting	0.0145
Industrial	0.0145

Add Back Fuel Overcollection from Base Rates	
GS/Lighting	-0.0900
Industrial	-0.0900

Add Back Non Fuel Purchased Power Collection from Base Rates	
GS/Lighting	0.0205
Industrial	0.0205

Add Back Fuel Cost Adj from Base Rates	
GS/Lighting	-0.33178
Industrial	-0.3024

Duke Energy Carolinas
Residential Lost Revenues September 2010 - December 2010

	Total Residential Sep 10- Dec 10			
kWh Sales	July-Oct	Nov-June		
RE	2,983,530,418	6,833,925,078		9,817,455,496
RS	5,049,108,520	7,850,953,860		12,900,062,380
Percent of Sales				
RE	30.390%	69.610%		
RS	39.140%	60.860%		
RE Rates				
First 350 kWh	8.5841	8.5841		8.5841
Over 350 kWh	8.5841	7.7735		8.0198
RS Rates				
First 350 kWh	8.5841	8.5841		8.5841
Over 350 kWh	8.5841	8.5841		8.5841
kWh per tier				
RE First 350 kWh	843,740,266	1,682,374,109		2,526,114,375
RE Over 350 kWh	2,139,790,152	5,151,550,969		7,291,341,121
kWh per tier				
RS First 350 kWh	1,262,861,281	2,482,221,969		3,745,083,250
RS Over 350 kWh	3,786,247,239	5,368,731,891		9,154,979,130
	First 1000kWh	Over 1000kWh		
RE	2,526,114,375	7,291,341,121	9,817,455,496	
RS	3,745,083,250	9,154,979,130	12,900,062,380	
RE Average	8.5841	8.0198		
RS Average	8.5841	8.5841		
Total	6,271,197,625	16,446,320,251	22,717,517,876	
RE	40%	44%		
RS	60%	56%		
	8.5841	8.3339		
Total kWh	0.27605118	0.72394882		
Average	**8.4030**			
Total of Riders	**(3.0729)**			
Total Res LMR	**5.33**			

Removal Of Fuel from Base Rates	
Residential	2.363439

Add Back CWIP from Base Rates	
Residential	-0.2083

Add Back Nuclear Insurance from Base Rates	
Residential	-0.0938

Add Back DSM Deferral from Base Rates	
Residential	0.0145

Add Back Fuel Overcollection from Base Rates	
Residential	-0.09

Add Back Non Fuel Purchased Power Collection from Base Rates	
Residential	0.0205

Add Back Fuel Cost Adj from Base Rates	
Residential	-0.352369

Duke Energy Carolinas
Non-Residential Lost Revenues 2012 Estimate

	Total OPT Sep 10 - Dec 10		
	On Peak kWh	Off Peak Kwh	
OPT I	2,359,876,570	7,974,827,712	10,334,704,282
OPT G	2,901,557,633	9,465,193,648	12,366,751,281
Rate OPT I	2.5902	0.4692	
Rate OPT G	3.0018	0.6986	
Total	5,261,434,203	17,440,021,360	22,701,455,563
OPT I	0.44852344	0.457271671	
OPT G	0.55147656	0.542728329	
	2.8172	0.5937	
On vs. off	0.231766381	0.768233619	
Average	**1.1090**		

Removal Of Fuel Cost Adj from Base Rates	
GS/Lighting	2.363
Industrial	2.3629

Add Back DSM Deferral from Base Rates	
GS/Lighting	0.0145
Industrial	0.0145

Add Back Fuel Cost Adj from Base Rates	
GS/Lighting	-0.33178
Industrial	-0.3024

Duke Energy Carolinas
Residential Lost Revenues 2012 Estimate

	Total Residential Sep 10- Dec 10			
kWh Sales	July-Oct	Nov-June		
RE	2,983,530,418	6,833,925,078		9,817,455,496
RS	5,049,108,520	7,850,953,860		12,900,062,380
Percent of Sales				
RE	30.390%	69.610%		
RS	39.140%	60.860%		
RE Rates				
First 350 kWh	8.5841	8.5841		8.5841
Over 350 kWh	8.5841	7.7735		8.0198
RS Rates				
First 350 kWh	8.5841	8.5841		8.5841
Over 350 kWh	8.5841	8.5841		8.5841
kWh per tier				
RE First 350 kWh	843,740,266	1,682,374,109		2,526,114,375
RE Over 350 kWh	2,139,790,152	5,151,550,969		7,291,341,121
kWh per tier				
RS First 350 kWh	1,262,861,281	2,482,221,969		3,745,083,250
RS Over 350 kWh	3,786,247,239	5,368,731,891		9,154,979,130
	First 1000kWh	Over 1000kWh		
RE	2,526,114,375	7,291,341,121	9,817,455,496	
RS	3,745,083,250	9,154,979,130	12,900,062,380	
RE Average	8.5841	8.0198		
RS Average	8.5841	8.5841		
Total	6,271,197,625	16,446,320,251	22,717,517,876	
RE	40%	44%		
RS	60%	56%		
	8.5841	8.3339		
Total kWh	0.27605118	0.72394882		
Average	**8.4030**			
Total of Riders	**(2.7013)**			
Total Res LMR	**5.7017**			

Removal Of Fuel from Base Rates	
Residential	2.363439

Add Back DSM Deferral from Base Rates	
Residential	0.0145

Add Back Fuel Cost Adj from Base Rates	
Residential	-0.352369

Duke Energy Carolinas
2009 Non - Residential Demand Rate

Total OPT Demand 2009

kW Sales	Summer	Winter	
OPT I	6,582,841	12,036,635	18,619,476
OPT G	9,019,179	16,394,782	25,413,961
Percent of Sales			
OPT I	35.355%	64.645%	
OPT G	35.489%	64.511%	
OPT I			
First 2000 KW	10.949	6.4446	8.0371
Next 3000 KW	10.0296	5.5167	7.1122
All KW over 5000 KW	9.1017	4.5804	6.1789
OPT G			
First 2000 KW	11.9761	7.0491	8.7976
Next 3000 KW	10.9704	6.0342	7.7860
All KW over 5000 KW	9.9555	5.01	6.7651
kW per tier OPT I			
First 2000 KW	3,444,544	6,665,931	10,110,475
Next 3000 KW	1,500,545	2,733,748	4,234,293
All KW over 5000 KW	1,637,752	2,636,956	4,274,708
kW per tier OPT G			
First 2000 KW	7,399,183	13,606,212	21,005,395
Next 3000 KW	665,039	1,236,927	1,901,966
All KW over 5000 KW	954,957	1,551,643	2,506,600

	First 2000 KW	Next 3000 KW	All KW over 5000 KW	
OPT I	10,110,475	4,234,293	4,274,708	18,619,476
OPT G	21,005,395	1,901,966	2,506,600	25,413,961
OPT I Average	8.0371	7.1122	6.1789	
OPT G Average	8.7976	7.7860	6.7651	
Total	31,115,870	6,136,259	6,781,308	44,033,437
OPT I	32%	69%	63%	
OPT G	68%	31%	37%	
	8.5505	7.3211	6.3956	
Total kW	0.706641864	0.139354532	0.154003604	
Average	**8.0473**			

Duke Energy Carolinas
2010 & 2012 Non - Residential Demand Rate

Total OPT Demand 2010/2012

kW Sales	Summer	Winter	
OPT I	6,582,841	12,036,635	18,619,476
OPT G	9,019,179	16,394,782	25,413,961
Percent of Sales			
OPT I	35.355%	64.645%	
OPT G	35.489%	64.511%	
OPT I			
First 2000 KW	12.9173	7.6145	9.4893
Next 3000 KW	11.8349	6.522	8.4004
All KW over 5000 KW	10.7425	5.4199	7.3017
OPT G			
First 2000 KW	14.008	8.246	10.2909
Next 3000 KW	12.8319	7.0591	9.1078
All KW over 5000 KW	11.6449	5.8613	7.9138
kW per tier OPT I			
First 2000 KW	3,444,544	6,665,931	10,110,475
Next 3000 KW	1,500,545	2,733,748	4,234,293
All KW over 5000 KW	1,637,752	2,636,956	4,274,708
kW per tier OPT G			
First 2000 KW	7,399,183	13,606,212	21,005,395
Next 3000 KW	665,039	1,236,927	1,901,966
All KW over 5000 KW	954,957	1,551,643	2,506,600

	First 2000 KW	Next 3000 KW	All KW over 5000 KW	
OPT I	10,110,475	4,234,293	4,274,708	18,619,476
OPT G	21,005,395	1,901,966	2,506,600	25,413,961
OPT I Average	9.4893	8.4004	7.3017	
OPT G Average	10.2909	9.1078	7.9138	
Total	31,115,870	6,136,259	6,781,308	44,033,437
OPT I	32%	69%	63%	
OPT G	68%	31%	37%	
	10.0304	8.6196	7.5280	
Total kW	0.706641864	0.139354532	0.154003604	
Average	**9.4484**			

North Carolina Found Revenues
June 2009 - December 2010 Actuals
December 2012 Estimate

	A	B	C	D	
	Actual/Reported KWH		Estimated KWH		Decision
	2009	2010	2011	2012	Tree Node
Boilers (unmetered)	575,990	-	-	-	Box 6 - include
Boilers (metered)	-	-	-	-	Box 6 - include
Economic Development	93,990,900	104,307,244	-	-	Box 5 - exclude
Food Service	693,553	949,022	252,035	264,637	Box 6 - include
Process Heat	31,014	1,783,740	2,562,483	2,818,732	Box 6 - include
Lighting	-	-	-	-	
Residential	186,735	291,269	301,897	301,897	Box 6 - include
Non Residential (Regulated)	295,184	271,717	679,374	713,343	Box 6 - include
Non Residential (Non Regulated)	3,630	3,630	2,146	-	Box 6 - include
Total KWH	95,777,007	107,606,622	3,797,936	4,098,609	
Total KWH Included	1,786,107	3,299,378	3,797,936	4,098,609	
Total KWH Included (net of Free Riders 15%)	1,518,191	2,804,471	3,228,245	3,483,817	
Annualized Found Revenue - Non Residential	$ 570,341	$ 1,132,434	$ 1,405,394	$ 126,505	
Annualized Found Revenue - Residential	$ 100,010	$ 159,942	$ 167,010	$ 167,010	

		2009	2010	2011	2012
1	Vintage 1 -2009 - Non Res	$ 220,846	570,341	570,341	349,496
2	Vintage 1 -2010 - Non Res		$ 677,906	1,132,434	1,132,434
3	Vintage 2 - Non Res			$ 761,291	1,405,394
4	Vintage 3 - Non Res				$ 685,236
5	Vintage 4 - Non Res				
6	Vintage 5 - Non Res				
7	Vintage 6 - Non Res				
	Rate Case Adjustment - Non Res				(1,481,930)
	Subtotal - Non Res	$ 220,846	$ 1,248,247	$ 2,464,066	$ 1,473,917
8	Vintage 1 -2009 - Residential	$ 33,827	100,010	100,010	66,182
9	Vintage 1 -2010 - Residential		$ 84,976	159,942	159,942
10	Vintage 2 - Residential			$ 90,464	167,010
11	Vintage 3 - Residential				$ 90,464
12	Vintage 4 - Residential				
13	Vintage 5 - Residential				
14	Vintage 6 - Residential				
	Rate Case Adjustment - Residenital				(226,125)
	Subtotal - Residential	$ 33,827	$ 184,985	$ 350,416	$ 257,474
	Total Found Revenues	$ 254,673	$ 1,433,232	$ 2,814,482	$ 1,731,391

DE Carolinas Revenue Collected

	06/01/09	7/1/2009	08/01/09	9/1/2009	10/01/09	11/1/2009	12/01/09
Rate 06/01/09-12/31/09	0.000382	0.000382	0.000382	0.000382	0.000382	0.000382	0.000382
Rate 01/01/2010-12/31/2010							
Residential Revenue 01/01/10-12/31/10	$ 231,986	$ 792,434	$ 778,955	$ 681,004	$ 518,322	$ 496,070	$ 725,824
kWh	1,598,138,135	2,074,433,837	2,039,150,463	1,782,733,431	1,356,863,197	1,298,613,843	1,900,063,686
Old rate	62%	100%	100%	100%	100%	100%	100%
New Rate	38%						
EE Rate 06/01/09-12/31/09	0.000068	0.000068	0.000068	0.000068	0.000068	0.000068	0.000068
EE Rate 01/01/2010-12/31/2010							
DSM Rate 09/01/2010-12/31/2010							
Non-Residential EE Revenue 01/01/10-12/31/10	$ 121,138	$ 204,633	$ 180,110	$ 203,629	$ 156,118	$ 139,632	$ 146,013
Non-Residential DSM Revenue 01/01/10-12/31/10							
kWh - EE	2,873,286,874	3,009,314,727	2,648,670,014	2,994,542,757	2,295,857,163	2,053,409,429	2,147,247,956
kWh - DSM							

	1/1/2010	02/01/10	3/1/2010	04/01/10	5/1/2010	06/01/10	7/1/2010	08/01/10	9/1/2010	10/01/10	11/1/2010	12/01/10
Rate 06/01/09-12/31/09	0.000382											
Rate 01/01/2010-12/31/2010	0.001206	0.001206	0.001206	0.001206	0.001206	0.001206	0.001206	0.001206	0.001206	0.001206	0.001206	0.001206
Residential Revenue 01/01/10-12/31/10	$ 1,932,135	$ 2,601,175.00	$ 2,370,242.52	$ 1,767,448.50	$ 1,552,017.07	$ 2,156,120.72	$ 2,821,613.49	$ 2,800,966.62	$ 2,459,372.82	$ 1,683,373.00	$ 1,584,819.27	$ 2,539,297.75
kWh	2,659,337,392	2,156,861,526	1,965,375,224	1,465,546,020	1,286,912,993	1,787,828,126	2,339,646,343	2,322,526,219	2,039,280,945	1,395,831,675	1,314,112,164	2,105,553,690
Old rate	58%											
New Rate	42%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
EE Rate 06/01/09-12/31/09	0.000068											
EE Rate 01/01/2010-12/31/2010	0.000226	0.000226	0.000226	0.000226	0.000226	0.000226	0.000226	0.000226	0.000226	0.000226	0.000226	0.000226
DSM Rate 09/01/2010-12/31/2010	0.000202	0.000202	0.000202	0.000202	0.000202	0.000202	0.000202	0.000202	0.000202	0.000202	0.000202	0.000202
Non-Residential EE Revenue 01/01/10-12/31/10	$ 307,327	$ 484,814.88	$ 473,878.23	$ 479,325.69	$ 458,275.60	$ 528,922.24	$ 575,772.69	$ 585,820.92	$ 859,405.91	$ 498,382.23	$ 463,878.61	$ 491,257.53
Non-Residential DSM Revenue 01/01/10-12/31/10	$ 193,305	$ 433,330.12	$ 423,554.87	$ 428,423.84	$ 409,609.16	$ 472,753.50	$ 514,628.69	$ 523,609.85	$ 222,855.20	$ 412,184.32	$ 382,564.35	$ 406,338.21
kWh - EE	2,292,488,981	2,145,198,598	2,096,806,308	2,120,910,117	2,027,768,131	2,340,363,879	2,547,666,776	2,592,127,967	3,802,681,031	2,205,231,108	2,052,560,212	2,173,705,863
kWh - DSM	2,292,488,981	2,145,198,598	2,096,806,308	2,120,910,117	2,027,768,131	2,340,363,879	2,547,666,776	2,592,127,967	1,103,243,577	2,040,516,424	1,893,882,915	2,011,575,299

Duke Energy Carolinas
Work Papers for V3 Estimated Program and Avoided Costs
Docket Number E-7 Sub 979

Residential Energy Assessments

Product Code	Name	Incremental Participants	Program Costs	Annual Cumulative kWh w/losses Net Free	Annual Cumulative Summer Coincident kW w/losses Net Free	Total Avoided Costs	2012 Annual Cost-Based Total Avoided Elec	2013 Annual Cost-Based Total Avoided Elec	2014 Annual Cost-Based Total Avoided Elec	2015 Annual Cost-Based Total Avoided Elec	2016 Annual Cost-Based Total Avoided Elec	2017 Annual Cost-Based Total Avoided Elec	2018 Annual Cost-Based Total Avoided Elec	2019 Annual Cost-Based Total Avoided Elec	2020 Annual Cost-Based Total Avoided Elec
HEHC	Home Energy House Call - Energy Efficiency Starter KIT	6,050	2,198,676	4,958,534	867	978,188	268,948	280,832	268,979	286,550	318,154	362,263	371,443	379,974	0
PER	Personalized Energy Report	9,680	325,777	2,752,934	291	313,202	136,590	142,897	135,891	145,368	162,701	0	0	0	0
	Totals	15,730	2,524,453	7,711,468	1,158	1,291,390	405,538	423,729	404,869	431,918	480,856	362,263	371,443	379,974	0

Home Energy Comparison Report

Product Code	Name	Incremental Participants	Program Costs	Annual Cumulative kWh w/losses Net Free	Annual Cumulative Summer Coincident kW w/losses Net Free	Total Avoided Costs	2012 Annual Cost-Based Total Avoided Elec	2013 Annual Cost-Based Total Avoided Elec	2014 Annual Cost-Based Total Avoided Elec	2015 Annual Cost-Based Total Avoided Elec	2016 Annual Cost-Based Total Avoided Elec	2017 Annual Cost-Based Total Avoided Elec	2018 Annual Cost-Based Total Avoided Elec	2019 Annual Cost-Based Total Avoided Elec	2020 Annual Cost-Based Total Avoided Elec
HECOMP	Home Energy Comparison Report	134,961	1,668,295	37,897,145	9,864	1,034,860	2,069,719	0	0	0	0	0	0	0	0
	Totals	134,961	1,668,295	37,897,145	9,864	1,034,860	2,069,719	0	0	0	0	0	0	0	0

Home Retrofit

Product Code	Name	Incremental Participants	Program Costs	Annual Cumulative kWh w/losses Net Free	Annual Cumulative Summer Coincident kW w/losses Net Free	Total Avoided Costs	2012 Annual Cost-Based Total Avoided Elec	2013 Annual Cost-Based Total Avoided Elec	2014 Annual Cost-Based Total Avoided Elec	2015 Annual Cost-Based Total Avoided Elec	2016 Annual Cost-Based Total Avoided Elec	2017 Annual Cost-Based Total Avoided Elec	2018 Annual Cost-Based Total Avoided Elec	2019 Annual Cost-Based Total Avoided Elec	2020 Annual Cost-Based Total Avoided Elec
HEHCRD	Home Retrofit	1,080	1,561,772	2,332,800	938	857,643	146,961	153,089	147,941	156,798	172,341	193,844	198,749	203,359	180,610
	Totals	1,080	1,561,772	2,332,800	938	857,643	146,961	153,089	147,941	156,798	172,341	193,844	198,749	203,359	180,610

Residential Smart Saver

Product Code	Name	Incremental Participants	Program Costs	Annual Cumulative kWh w/losses Net Free	Annual Cumulative Summer Coincident kW w/losses Net Free	Total Avoided Costs	2012 Annual Cost-Based Total Avoided Elec	2013 Annual Cost-Based Total Avoided Elec	2014 Annual Cost-Based Total Avoided Elec	2015 Annual Cost-Based Total Avoided Elec	2016 Annual Cost-Based Total Avoided Elec	2017 Annual Cost-Based Total Avoided Elec	2018 Annual Cost-Based Total Avoided Elec	2019 Annual Cost-Based Total Avoided Elec	2020 Annual Cost-Based Total Avoided Elec
SSAC	Smart Saver - Central Air Conditioner	1,830	845,273	1,248,097	445	419,638	71,145	74,333	71,035	75,774	84,346	96,331	98,773	101,036	87,575
SSHP	Smart Saver - Heat Pump	3,617	1,693,754	2,466,866	411	829,417	140,618	146,919	140,401	149,768	166,709	190,399	195,226	199,698	173,091
RCFL	RCFL Opt-In Free CFLs	1,007,826	4,243,873	47,769,941	5,049	5,434,800	2,370,166	2,479,609	2,358,024	2,522,476	2,823,257	0	0	0	0
RCFLPM	Property Manager 13WCFL	445,000	1,019,795	20,359,033	2,152	2,231,718	973,273	1,018,214	968,287	1,035,817	1,159,328	0	0	0	0
	Totals	1,458,273	7,802,694	71,843,937	8,057	8,915,573	3,555,201	3,719,075	3,537,747	3,783,836	4,233,639	286,730	293,999	300,734	260,666

Low Income and Weatherization Assistance

Product Code	Name	Incremental Participants	Program Costs	Annual Cumulative kWh w/losses Net Free	Annual Cumulative Summer Coincident kW w/losses Net Free	Total Avoided Costs	2012 Annual Cost-Based Total Avoided Elec	2013 Annual Cost-Based Total Avoided Elec	2014 Annual Cost-Based Total Avoided Elec	2015 Annual Cost-Based Total Avoided Elec	2016 Annual Cost-Based Total Avoided Elec	2017 Annual Cost-Based Total Avoided Elec	2018 Annual Cost-Based Total Avoided Elec	2019 Annual Cost-Based Total Avoided Elec	2020 Annual Cost-Based Total Avoided Elec
REFRPL	Low Income Weatherization- Refrigerator Replacement	250	369,995	235,141	27	73,938	12,473	13,050	12,405	13,273	14,863	17,095	17,529	17,928	15,365
WZELEC	Low Income Weatherization- Tier 1	50	255,913	42,503	6	13,945	2,360	2,467	2,353	2,513	2,803	3,210	3,291	3,366	2,906
WZELEC	Low Income Weatherization- Tier 2	100	464,960	170,012	25	55,781	9,440	9,868	9,412	10,051	11,212	12,839	13,164	13,465	11,623
	Totals	400	1,090,868	447,655	58	143,664	24,272	25,385	24,169	25,837	28,878	33,144	33,984	34,760	29,893

Energy Efficiency Programs for Schools

Product Code	Name	Incremental Participants	Program Costs	Annual Cumulative kWh w/losses Net Free	Annual Cumulative Summer Coincident kW w/losses Net Free	Total Avoided Costs	2012 Annual Cost-Based Total Avoided Elec	2013 Annual Cost-Based Total Avoided Elec	2014 Annual Cost-Based Total Avoided Elec	2015 Annual Cost-Based Total Avoided Elec	2016 Annual Cost-Based Total Avoided Elec	2017 Annual Cost-Based Total Avoided Elec	2018 Annual Cost-Based Total Avoided Elec	2019 Annual Cost-Based Total Avoided Elec	2020 Annual Cost-Based Total Avoided Elec
K12CFL	K-12 Education Program- Curriculum	26,000	1,504,607	6,353,960	1,179	795,211	347,016	362,251	347,314	369,786	410,100	0	0	0	0
	Totals	26,000	1,504,607	6,353,960	1,179	795,211	347,016	362,251	347,314	369,786	410,100	0	0	0	0

Power Manager

Product Code	Name	Incremental Participants	Program Costs	Annual Cumulative kWh w/losses Net Free	Annual Cumulative Summer Coincident kW w/losses Net Free	Total Avoided Costs	2012 Annual Cost-Based Avoided Elec Capacity	2013 Annual Cost-Based Avoided Elec Capacity	2014 Annual Cost-Based Avoided Elec Capacity	2015 Annual Cost-Based Avoided Elec Capacity	2016 Annual Cost-Based Avoided Elec Capacity	2017 Annual Cost-Based Avoided Elec Capacity	2018 Annual Cost-Based Avoided Elec Capacity	2019 Annual Cost-Based Avoided Elec Capacity	2020 Annual Cost-Based Avoided Elec Capacity
PWRMGR	PowerManager	221,373	17,056,983	0	333,879	18,805,413	25,073,884	0	0	0	0	0	0	0	0
	Totals	221,373	17,056,983	0	333,879	18,805,413	25,073,884	0	0	0	0	0	0	0	0

2021	2022	2023	2024	2025	2026
Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0

2021	2022	2023	2024	2025	2026
Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec
0	0	0	0	0	0
0	0	0	0	0	0

2021	2022	2023	2024	2025	2026
Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec
194,095	208,856	206,900	220,490	211,616	219,727
194,095	208,856	206,900	220,490	211,616	219,727

2021	2022	2023	2024	2025	2026
Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec
94,916	102,981	101,433	108,804	103,260	107,462
187,602	203,542	200,482	215,050	204,094	212,399
0	0	0	0	0	0
0	0	0	0	0	0
282,518	306,523	301,914	323,854	307,354	319,860

2021	2022	2023	2024	2025	2026
Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec
16,719	18,210	17,888	19,246	18,171	18,930
3,154	3,427	3,372	3,621	3,430	3,571
12,616	13,707	13,487	14,484	13,719	14,283
32,489	35,343	34,748	37,351	35,320	36,784

2021	2022	2023	2024	2025	2026
Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec
0	0	0	0	0	0
0	0	0	0	0	0

2021	2022	2023	2024	2025	2026
Annual Cost-Based Avoided Elec Capacity	Annual Cost-Based Avoided Elec Capacity	Annual Cost-Based Avoided Elec Capacity	Annual Cost-Based Avoided Elec Capacity	Annual Cost-Based Avoided Elec Capacity	Annual Cost-Based Avoided Elec Capacity
0	0	0	0	0	0
0	0	0	0	0	0

Duke Energy Carolinas
Work Papers for V3 Estimated Program and Avoided Costs
Docket Number E-7 Sub 979

Smart Saver® for Non-Residential Customers Lighting

Product Code	Name	Incremental Participants	Program Costs	Annual Cumulative kWh w/losses Net Free	Annual Cumulative Summer Coincident kW w/losses Net Free	Total Avoided Costs	2012 Annual Cost-Based Total Avoided Elec	2013 Annual Cost-Based Total Avoided Elec	2014 Annual Cost-Based Total Avoided Elec	2015 Annual Cost-Based Total Avoided Elec	2016 Annual Cost-Based Total Avoided Elec	2017 Annual Cost-Based Total Avoided Elec	2018 Annual Cost-Based Total Avoided Elec	2019 Annual Cost-Based Total Avoided Elec	2020 Annual Cost-Based Total Avoided Elec
NRLTG	2 High Bay 6L T-5 High Output replacing 1000W HID	298	50,567	382,535	78	101,520	20,359	21,236	20,422	21,706	23,990	27,167	27,855	28,497	25,039
NRLTG	2 High Bay Fluorescent 8LF32T8 - Replacing 1000W HID	25	4,214	32,836	7	8,714	1,748	1,823	1,753	1,863	2,059	2,332	2,391	2,446	2,149
NRLTG	42W 8 Lamp High Bay Compact Fluorescent	15	1,053	4,831	1	1,283	257	268	258	274	303	343	352	360	316
NRLTG	Compact Fluorescent Fixture	994	14,046	325,417	66	86,382	17,324	18,070	17,377	18,469	20,413	23,115	23,701	24,247	21,305
NRLTG	Compact Fluorescent Screw in	47,131	99,948	8,977,351	1,829	470,511	477,516	498,084	0	0	0	0	0	0	0
NRLTG	High Bay 2L T-5 High Output	348	14,749	73,510	15	19,542	3,919	4,088	3,932	4,179	4,618	5,228	5,361	5,485	4,820
NRLTG	High Bay 3L T-5 High Output	994	56,185	367,086	75	97,431	19,540	20,381	19,600	20,831	23,024	26,072	26,732	27,349	24,030
NRLTG	High Bay 4L T-5 High Output	4,968	351,157	3,265,679	666	866,573	173,786	181,270	174,319	185,276	204,778	231,895	237,768	243,253	213,727
NRLTG	High Bay 6L T-5 High Output	3,726	210,694	1,168,384	239	310,154	62,201	64,879	62,393	66,314	73,292	82,994	85,096	87,059	76,496
NRLTG	High Bay 8L T-5 High Output	248	26,337	265,714	70	76,173	15,348	15,987	15,452	16,375	17,995	20,236	20,748	21,229	18,861
NRLTG	High Bay T8 4ft Fluorescent 3 Lamp (F32 Watt T8)	410	17,382	92,455	25	26,563	5,353	5,575	5,390	5,711	6,275	7,055	7,234	7,401	6,578
NRLTG	High Bay T8 4ft Fluorescent 4 Lamp (F32 Watt T8)	2,111	119,393	892,578	182	236,827	47,494	49,539	47,639	50,634	55,964	63,376	64,981	66,480	58,410
NRLTG	High Bay T8 4ft Fluorescent 6 Lamp (F32 Watt T8)	24,839	1,755,784	16,905,407	3,450	4,486,424	899,731	938,477	902,493	959,219	1,060,178	1,200,557	1,230,961	1,259,356	1,106,515
NRLTG	High Bay T8 4ft Fluorescent 8 Lamp (F32 Watt T8)	1,863	105,347	852,483	174	226,241	45,372	47,325	45,511	48,371	53,463	60,541	62,075	63,506	55,799
NRLTG	High Performance Low Watt T8 4ft 1 lamp, replacing standard T8	514	2,908	11,644	2	3,075	617	643	618	657	727	823	844	864	758
NRLTG	High Performance Low Watt T8 4ft 2 lamp, replacing standard T8	2,981	25,283	95,007	19	25,193	5,052	5,270	5,067	5,386	5,953	6,742	6,913	7,072	6,213
NRLTG	High Performance Low Watt T8 4ft 3 lamp, replacing standard T8	3,974	56,185	213,362	44	56,721	11,376	11,866	11,412	12,129	13,404	15,176	15,560	15,919	13,991
NRLTG	High Performance Low Watt T8 4ft 4 lamp, replacing standard T8	2,057	34,891	117,313	24	31,158	6,249	6,518	6,268	6,662	7,363	8,337	8,548	8,745	7,685
NRLTG	High Performance T8 4ft 1 lamp, replacing standard T8	849	4,799	14,234	3	3,723	746	778	748	795	880	998	1,023	1,047	918
NRLTG	High Performance T8 4ft 1 lamp, replacing T12-HPT8	849	7,199	46,276	9	12,299	2,467	2,573	2,475	2,630	2,906	3,291	3,374	3,452	3,034
NRLTG	High Performance T8 4ft 2 lamp, replacing standard T8	849	7,199	22,774	4	5,957	1,194	1,245	1,196	1,272	1,408	1,596	1,637	1,675	1,468
NRLTG	High Performance T8 4ft 2 lamp, replacing T12 8ft 1 lamp	686	9,692	39,676	8	10,496	2,105	2,195	2,111	2,244	2,480	2,810	2,881	2,947	2,588
NRLTG	High Performance T8 4ft 2 lamp, replacing T12 High Output 8ft 1 lamp	857	24,230	128,664	26	34,097	6,837	7,132	6,858	7,289	8,058	9,126	9,357	9,573	8,409
NRLTG	High Performance T8 4ft 2 lamp, replacing T12-HPT8	849	9,599	60,096	22	19,302	3,913	4,069	3,959	4,180	4,558	5,077	5,206	5,327	4,805
NRLTG	High Performance T8 4ft 3 lamp, replacing standard T8	849	7,439	25,620	5	6,702	1,343	1,401	1,346	1,431	1,584	1,796	1,841	1,884	1,652
NRLTG	High Performance T8 4ft 3 lamp, replacing T12-HPT8	849	14,398	106,078	22	28,176	5,651	5,894	5,668	6,024	6,658	7,539	7,730	7,908	6,949
NRLTG	High Performance T8 4ft 4 lamp, replacing standard T8	849	14,398	38,439	8	10,152	2,035	2,123	2,041	2,170	2,399	2,718	2,787	2,851	2,503
NRLTG	High Performance T8 4ft 4 lamp, replacing T12 8ft 2 lamp	343	4,846	14,375	3	3,289	762	795	764	812	898	1,017	1,043	1,067	937
NRLTG	High Performance T8 4ft 4 lamp, replacing T12 High Output 8ft 2 lamp	2,742	96,919	694,680	142	184,540	37,011	38,604	37,126	39,458	43,608	49,378	50,628	51,796	45,517
NRLTG	High Performance T8 4ft 4 lamp, replacing T12-HPT8	849	19,198	124,584	25	33,046	6,627	6,912	6,647	7,065	7,809	8,843	9,067	9,276	8,150
NRLTG	LED Auto Traffic Signals	943	16,658	225,487	69	37,816	13,770	14,332	13,895	14,700	16,096	18,021	0	0	0
NRLTG	LED Case lighting sensor control	50	702	13,300	1	1,349	588	616	585	626	702	0	0	0	0
NRLTG	LED Case lighting	497	35,116	195,649	17	53,889	8,653	9,057	8,596	9,206	10,327	11,904	12,206	12,483	10,662
NRLTG	LED Exit Signs Electronic Fixtures (Retrofit Only)	2,484	35,116	368,387	50	109,599	17,707	18,504	17,670	18,857	21,007	24,015	24,624	25,187	21,798
NRLTG	LED Pedestrian Signals	343	12,115	44,735	13	7,360	2,679	2,789	2,701	2,859	3,135	3,515	0	0	0
NRLTG	Light Tube	5	527	1,339	0	459	83	86	84	88	97	108	111	114	102
NRLTG	Low Watt T8 lamps 2-4ft, replacing standard 32 Watt T8	59,612	42,139	647,410	133	79,175	34,559	36,045	34,670	36,845	40,714	0	0	0	0
NRLTG	Occupancy Sensors over 500 Watts	343	19,384	407,270	83	93,567	21,675	22,609	21,742	23,108	25,541	28,923	29,655	30,339	26,657
NRLTG	Occupancy Sensors under 500 Watts	5,484	155,071	2,605,569	542	601,711	139,431	145,422	139,895	148,658	164,239	185,897	190,604	195,003	171,468
NRLTG	Plug Load Occupancy Sensors Document Stations	50	1,756	38,629	3	3,812	1,662	1,741	1,648	1,767	1,988	0	0	0	0
NRLTG	Pulse Start Metal Halide 320W retrofit only	69	2,908	18,685	4	4,960	995	1,038	998	1,061	1,172	1,327	1,361	1,392	1,223
NRLTG	T-5 4 ft 1 Lamp with Electronic Ballast (replacing T-12 fixture)	10	70	349	0	93	19	19	19	20	22	25	25	26	23
NRLTG	T-5 4 ft 2 Lamp with Electronic Ballast (replacing T-12 fixture)	248	2,809	8,655	2	2,303	462	482	464	493	544	616	632	646	568
NRLTG	T-5 4 ft 3 Lamp with Electronic Ballast (replacing T-12 fixture)	99	1,405	7,847	2	2,084	418	436	419	446	492	558	572	585	514
NRLTG	T-5 4 ft 4 Lamp with Electronic Ballast (replacing T-12 fixture)	149	2,528	10,501	2	2,786	559	583	560	596	658	746	764	782	687
NRLTG	T-5 High Output 1 Lamp with Electronic Ballast (replacing T-12 fixture)	35	295	1,535	0	407	82	85	82	87	96	109	112	114	100
NRLTG	T-5 High Output 2 Lamp with Electronic Ballast (replacing T-12 fixture)	204	2,592	11,355	2	3,013	604	630	606	644	712	806	827	846	743
NRLTG	T-5 High Output 3 Lamp with Electronic Ballast (replacing T-12 fixture)	160	2,488	11,766	2	3,120	626	653	628	667	737	835	856	876	769
NRLTG	T-5 High Output 4 Lamp with Electronic Ballast (replacing T-12 fixture)	142	2,611	21,672	4	5,752	1,153	1,203	1,157	1,230	1,359	1,539	1,578	1,614	1,419
NRLTG	T-8 2ft 1 lamp	137	582	4,034	1	1,070	215	224	215	229	253	286	294	300	264
NRLTG	T-8 2ft 2 lamp	686	3,877	48,304	10	12,817	2,570	2,681	2,578	2,740	3,029	3,430	3,517	3,598	3,161
NRLTG	T-8 2ft 3 lamp	343	2,035	11,944	2	3,179	638	665	640	680	751	850	872	892	784
NRLTG	T-8 2ft 4 lamp	69	582	9,449	2	2,508	503	525	504	536	593	671	688	704	619
NRLTG	T-8 3ft 1 lamp	137	582	8,493	2	2,251	451	471	453	481	532	602	618	632	555
NRLTG	T-8 3ft 2 lamp	137	775	14,120	3	3,744	751	783	753	800	885	1,002	1,027	1,051	923
NRLTG	T-8 3ft 3 lamp	69	630	11,466	2	3,043	610	636	612	651	719	814	835	854	750
NRLTG	T-8 3ft 4 lamp	69	969	14,863	3	3,946	791	825	794	844	932	1,056	1,083	1,108	973
NRLTG	T-8 4ft 1 lamp	1,371	5,815	48,832	10	12,918	2,590	2,702	2,598	2,761	3,053	3,458	3,546	3,627	3,186
NRLTG	T-8 4ft 2 lamp	13,711	77,535	520,219	107	138,252	27,728	28,922	27,815	29,562	32,670	36,991	37,928	38,803	34,101
NRLTG	T-8 4ft 3 lamp	6,855	87,227	520,219	107	138,252	27,728	28,922	27,815	29,562	32,670	36,991	37,928	38,803	34,101
NRLTG	T-8 4ft 4 lamp	15,082	234,545	1,413,056	289	375,205	75,248	78,488	75,481	80,224	88,664	100,399	102,941	105,316	92,542
NRLTG	T-8 8ft 1 lamp	2,742	19,384	135,895	28	36,127	7,246	7,558	7,269	7,725	8,537	9,666	9,911	10,139	8,911
NRLTG	T-8 8ft 2 lamp	2,742	27,137	112,534	23	29,871	5,991	6,249	6,009	6,387	7,059	7,993	8,196	8,385	7,367
NRLTG	T-8 High Output 8 ft 1 Lamp	25	351	2,404	0	638	128	133	128	136	151	171	175	179	157
NRLTG	T-8 High Output 8 ft 2 Lamp	994	19,665	136,936	28	36,345	7,289	7,603	7,311	7,771	8,589	9,726	9,972	10,202	8,964
	Totals	225,004	3,984,018	43,011,995	8,791	9,295,685	2,290,134	2,388,738	1,818,237	1,932,476	2,135,769	2,369,228	2,407,147	2,462,672	2,163,715

Smart Saver® for Non-Residential Customers Pumps and Motors

Product Code	Name	Incremental Participants	Program Costs	Annual Cumulative kWh w/losses Net Free	Annual Cumulative Summer Coincident kW w/losses Net Free	Total Avoided Costs	2012 Annual Cost-Based Total Avoided Elec	2013 Annual Cost-Based Total Avoided Elec	2014 Annual Cost-Based Total Avoided Elec	2015 Annual Cost-Based Total Avoided Elec	2016 Annual Cost-Based Total Avoided Elec	2017 Annual Cost-Based Total Avoided Elec	2018 Annual Cost-Based Total Avoided Elec	2019 Annual Cost-Based Total Avoided Elec	2020 Annual Cost-Based Total Avoided Elec
NRP&M	1!5 Horse Power High Efficiency Pumps	9	1,300	2,300	1	741	127	132	128	136	149	167	172	176	156
NRP&M	10 Horse Power High Efficiency Pumps	17	3,538	30,712	8	9,902	1,698	1,769	1,711	1,812	1,990	2,235	2,292	2,345	2,087
NRP&M	15 Horse Power High Efficiency Pumps	9	3,117	23,030	6	7,425	1,273	1,326	1,283	1,359	1,492	1,676	1,718	1,758	1,565
NRP&M	2 Horse Power High Efficiency Pumps	6	1,243	2,050	1	661	113	118	114	121	133	149	153	156	139
NRP&M	20 Horse Power High Efficiency Pumps	6	2,842	20,470	6	6,599	1,132	1,179	1,140	1,208	1,326	1,490	1,527	1,563	1,391
NRP&M	3 Horse Power High Efficiency Pumps	6	1,243	3,072	1	990	170	177	171	181	199	224	229	235	209
NRP&M	5 Horse Power High Efficiency Pumps	6	1,211	5,116	1	1,649	283	295	285	302	331	372	382	391	348
NRP&M	7!5 Horse Power High Efficiency Pumps	14	4,422	19,192	5	6,187	1,061	1,105	1,069	1,132	1,243	1,397	1,432	1,465	1,304
NRP&M	VFD HVAC Fan	691	39,092	672,491	126	152,251	35,218	36,751	35,281	37,536	41,569	47,185	48,380	49,494	43,323
NRP&M	VFD HVAC Pump	691	97,731	1,774,941	333	401,843	92,952	97,000	93,119	99,071	109,714	124,537	127,692	130,632	114,344
NRP&M	VFD Process Pump 1-50 HP	201	11,377	145,074	31	45,792	7,816	8,151	7,844	8,334	9,203	10,410	10,673	10,920	9,611
	Totals	1,656	167,117	2,698,447	519	634,041	141,844	148,003	142,145	151,192	167,348	189,841	194,650	199,134	174,476

Smart Saver® for Non-Residential Customers - Other Prescriptive

Product Code	Name	Incremental Participants	Program Costs	Annual Cumulative kWh w/losses Net Free	Annual Cumulative Summer Coincident kW w/losses Net Free	Total Avoided Costs	2012 Annual Cost-Based Total Avoided Elec	2013 Annual Cost-Based Total Avoided Elec	2014 Annual Cost-Based Total Avoided Elec	2015 Annual Cost-Based Total Avoided Elec	2016 Annual Cost-Based Total Avoided Elec	2017 Annual Cost-Based Total Avoided Elec	2018 Annual Cost-Based Total Avoided Elec	2019 Annual Cost-Based Total Avoided Elec	2020 Annual Cost-Based Total Avoided Elec
NROTHR	Barrel Wraps (Inj Mold & Extruders) kW per ton	99	140	4,311	1	485	212	221	211	225	251	0	0	0	0
NROTHR	Engineered Nozzles - COMPRESS AIR	5	140	10,816	2	1,298	566	591	567	604	669	0	0	0	0
NROTHR	Pellet Dryer Tanks & Ducts 3in dia per ft	1	17	75	0	8	4	4	4	4	4	0	0	0	0
NROTHR	Pellet Dryer Tanks & Ducts 4in dia per ft	1	25	111	0	13	5	6	5	6	7	0	0	0	0
NROTHR	Pellet Dryer Tanks & Ducts 5in dia per ft	1	30	148	0	17	7	8	7	8	9	0	0	0	0
NROTHR	Pellet Dryer Tanks & Ducts 6in dia per ft	1	42	186	0	21	9	10	9	10	11	0	0	0	0
NROTHR	Pellet Dryer Tanks & Ducts 8in dia per ft	1	56	297	0	34	15	15	15	16	17	0	0	0	0
	Totals	109	451	15,945	3	1,875	818	854	819	872	967	0	0	0	0

Smart Saver® for Non-Residential Customers - Energy Star Food Service Products

Product Code	Name	Incremental Participants	Program Costs	Annual Cumulative kWh w/losses Net Free	Annual Cumulative Summer Coincident kW w/losses Net Free	Total Avoided Costs	2012 Annual Cost-Based Total Avoided Elec	2013 Annual Cost-Based Total Avoided Elec	2014 Annual Cost-Based Total Avoided Elec	2015 Annual Cost-Based Total Avoided Elec	2016 Annual Cost-Based Total Avoided Elec	2017 Annual Cost-Based Total Avoided Elec	2018 Annual Cost-Based Total Avoided Elec	2019 Annual Cost-Based Total Avoided Elec	2020 Annual Cost-Based Total Avoided Elec
NRFS	Anti-sweat Heater Controls	0	6	134	0	35	7	7	7	7	8	9	10	10	9
NRFS	Combination Oven (90 lbs_hr)	12	16,856	189,264	36	55,023	10,998	11,483	11,003	11,719	13,005	14,799	15,174	15,523	13,533
NRFS	Convection Oven	10	2,809	19,356	4	5,627	1,125	1,174	1,125	1,198	1,330	1,513	1,552	1,587	1,384
NRFS	ENERGY STAR Commercial Glass Door Freezers 15 to 30 ft3 - var	1	73	1,184	0	304	60	63	60	64	72	83	85	87	74
NRFS	ENERGY STAR Commercial Glass Door Freezers 30 to 50ft3 - var	1	97	2,286	0	587	116	122	115	124	139	160	164	168	143
NRFS	ENERGY STAR Commercial Glass Door Freezers less than 15ft3 - var	1	48	1,000	0	257	51	53	51	54	61	70	72	73	63
NRFS	ENERGY STAR Commercial Glass Door Freezers more than 50ft3 - var	1	121	4,205	0	1,080	214	224	212	228	255	294	302	309	264
NRFS	ENERGY STAR Commercial Glass Door Refrigerators 15 to 30 ft3 - var	1	73	395	0	101	20	21	20	21	24	28	28	29	25
NRFS	ENERGY STAR Commercial Glass Door Refrigerators 30 to 50ft3 - var	1	97	430	0	111	22	23	22	23	26	30	31	32	27
NRFS	ENERGY STAR Commercial Glass Door Refrigerators less than 15ft3 - var	1	48	427	0	110	22	23	22	23	26	30	31	31	27
NRFS	ENERGY STAR Commercial Glass Door Refrigerators more than 50ft3 - var	1	121	530	0	136	27	28	27	29	32	37	38	39	33
NRFS	ENERGY STAR Commercial Solid Door Freezers 15 to 30 ft3 - var	1	73	513	0	132	26	27	26	28	31	36	37	38	32
NRFS	ENERGY STAR Commercial Solid Door Freezers 30 to 50ft3 - var	1	97	1,021	0	262	52	54	52	55	62	71	73	75	64
NRFS	ENERGY STAR Commercial Solid Door Freezers less than 15ft3 - var	1	48	352	0	90	18	19	18	19	21	25	25	26	22
NRFS	ENERGY STAR Commercial Solid Door Freezers more than 50ft3 - var	1	121	2,220	0	570	113	118	112	120	135	155	159	163	139
NRFS	ENERGY STAR Commercial Solid Door Refrigerators 15 to 30 ft3 - var	1	73	256	0	66	13	14	13	14	16	18	18	19	16
NRFS	ENERGY STAR Commercial Solid Door Refrigerators 30 to 50ft3 - var	1	97	466	0	120	24	25	24	25	28	33	33	34	29
NRFS	ENERGY STAR Commercial Solid Door Refrigerators less than 15ft3 - var	1	48	160	0	41	8	8	8	9	10	11	11	12	10
NRFS	ENERGY STAR Commercial Solid Door Refrigerators more than 50ft3 - var	1	121	669	0	172	34	36	34	36	41	47	48	49	42
NRFS	Fryer	10	2,107	9,984	1	2,733	544	569	543	579	646	740	759	776	670
NRFS	Griddles	10	2,809	14,006	3	4,072	814	850	814	867	962	1,095	1,123	1,149	1,001
NRFS	Holding Cabinet Full Size Insulated	15	8,428	67,477	10	18,699	3,725	3,893	3,717	3,967	4,420	5,055	5,183	5,302	4,586
NRFS	Holding Cabinet Half Size Insulated	10	2,809	15,375	2	4,260	849	887	847	904	1,007	1,152	1,181	1,208	1,045
NRFS	Holding Cabinet Three Quarter Size Insulated	15	6,321	36,265	6	10,050	2,002	2,092	1,998	2,132	2,376	2,717	2,786	2,849	2,465
NRFS	Icemaker (100 to 500 lbs_day)	10	2,107	5,127	0	1,315	260	273	259	277	311	359	368	376	321
NRFS	Icemaker (500 to 1000 lbs_day)	10	3,165	7,644	1	1,964	389	407	386	414	464	535	549	561	479
NRFS	Icemaker (Greater Than 1000 lbs_day)	10	4,220	11,003	1	2,824	559	586	556	595	668	770	790	807	689
NRFS	Night covers for displays	99	702	8,138	2	977	426	445	427	454	503	0	0	0	0
NRFS	Steamer_3 pan	8	6,978	79,265	15	23,044	4,606	4,809	4,608	4,908	5,447	6,198	6,355	6,501	5,668
NRFS	Steamer_4 pan	8	6,978	88,277	17	25,664	5,130	5,356	5,132	5,466	6,066	6,903	7,078	7,240	6,312
NRFS	Steamer_5 pan	8	6,978	97,995	19	28,489	5,694	5,945	5,697	6,068	6,734	7,663	7,857	8,037	7,007
NRFS	Steamer_6 pan	7	5,815	89,570	17	26,040	5,205	5,434	5,207	5,546	6,155	7,004	7,181	7,346	6,404
NRFS	Vending Equipment Controller	5	351	2,997	0	500	113	119	111	120	137	160	165	168	140
	Totals	258	80,796	757,990	136	215,452	43,267	45,187	43,250	46,094	51,217	57,800	59,265	60,625	52,723

Smart Saver® for Non-Residential Customers - HVAC

Product Code	Name	Incremental Participants	Program Costs	Annual Cumulative kWh w/losses Net Free	Annual Cumulative Summer Coincident kW w/losses Net Free	Total Avoided Costs	2012 Annual Cost-Based Total Avoided Elec	2013 Annual Cost-Based Total Avoided Elec	2014 Annual Cost-Based Total Avoided Elec	2015 Annual Cost-Based Total Avoided Elec	2016 Annual Cost-Based Total Avoided Elec	2017 Annual Cost-Based Total Avoided Elec	2018 Annual Cost-Based Total Avoided Elec	2019 Annual Cost-Based Total Avoided Elec	2020 Annual Cost-Based Total Avoided Elec
NRHVAC	AC 135,000 - 240,000 per ton	548	31,014	62,648	25	26,090	4,503	4,681	4,557	4,810	5,242	5,834	5,982	6,121	5,528
NRHVAC	AC 240,000 - 760,000 per ton	857	24,230	51,331	21	21,377	3,689	3,836	3,734	3,941	4,295	4,780	4,901	5,016	4,529
NRHVAC	AC 65,000 - 135,000 per ton	274	9,692	17,670	7	7,359	1,270	1,320	1,285	1,357	1,478	1,646	1,687	1,727	1,559
NRHVAC	AC greater than 760,000 per ton	668	28,349	59,083	24	24,605	4,247	4,415	4,298	4,536	4,944	5,502	5,641	5,773	5,213
NRHVAC	AC less than 65,000 1 Ph per ton	86	3,029	5,365	2	2,234	386	401	390	412	449	500	512	524	473
NRHVAC	AC less than 65,000 3 Ph per ton	69	1,938	3,213	1	1,338	231	240	234	247	269	299	307	314	283
NRHVAC	Air-Cooled Recip Chiller COP = 2.86, IPLV = 3.12 per ton	137	1,551	4,336	2	2,190	312	324	315	333	363	404	414	424	383
NRHVAC	Air-Cooled Recip Chiller COP = 2.86, IPLV = 3.48 per ton	274	7,622	36,994	15	18,689	2,659	2,764	2,691	2,840	3,095	3,445	3,532	3,615	3,264
NRHVAC	Air-Cooled Recip Chiller COP = 2.86, IPLV = 3.97 per ton	274	12,458	67,120	27	33,908	4,824	5,015	4,883	5,153	5,616	6,251	6,409	6,558	5,922
NRHVAC	Air-Cooled Recip Chiller COP = 2.86, IPLV = 4.33 per ton	137	7,657	40,639	16	20,530	2,921	3,037	2,956	3,120	3,400	3,785	3,880	3,971	3,586
NRHVAC	Air-Cooled Recip Chiller COP = 3.08, IPLV = 3.36 per ton	43	1,514	7,023	3	3,548	505	525	511	539	588	654	671	686	620
NRHVAC	Air-Cooled Recip Chiller COP = 3.08, IPLV = 3.76 per ton	43	2,187	10,535	4	5,322	757	787	766	809	881	981	1,006	1,029	930
NRHVAC	Air-Cooled Recip Chiller COP = 3.08, IPLV = 4.28 per ton	43	2,877	14,538	6	7,345	1,045	1,086	1,058	1,116	1,216	1,354	1,388	1,421	1,283
NRHVAC	Air-Cooled Recip Chiller COP = 3.08, IPLV = 4.67 per ton	43	3,289	16,498	7	8,334	1,186	1,233	1,200	1,267	1,380	1,536	1,575	1,612	1,456
NRHVAC	Air-Cooled Recip Chiller COP = 3.36, IPLV = 3.66 per ton	43	1,817	12,949	5	6,542	931	968	942	994	1,083	1,206	1,236	1,265	1,143
NRHVAC	Air-Cooled Recip Chiller COP = 3.36, IPLV = 4.10 per ton	43	2,441	16,169	7	8,169	1,162	1,208	1,176	1,241	1,353	1,506	1,544	1,580	1,427
NRHVAC	Air-Cooled Recip Chiller COP = 3.36, IPLV = 4.67 per ton	43	3,077	19,840	8	10,023	1,426	1,482	1,443	1,523	1,660	1,848	1,894	1,939	1,751
NRHVAC	Air-Cooled Recip Chiller COP = 3.36, IPLV = 5.09 per ton	43	3,453	21,637	9	10,931	1,555	1,617	1,574	1,661	1,810	2,015	2,066	2,114	1,909
NRHVAC	Air-Cooled Screw Chiller COP = 2.86, IPLV = 3.12 per ton	137	1,551	6,162	2	3,113	443	460	448	473	516	574	588	602	544
NRHVAC	Air-Cooled Screw Chiller COP = 2.86, IPLV = 3.48 per ton	274	7,622	39,185	16	19,796	2,816	2,928	2,851	3,008	3,279	3,649	3,741	3,829	3,458
NRHVAC	Air-Cooled Screw Chiller COP = 2.86, IPLV = 3.97 per ton	274	12,458	53,279	22	26,916	3,829	3,981	3,876	4,090	4,458	4,962	5,087	5,206	4,701
NRHVAC	Air-Cooled Screw Chiller COP = 2.86, IPLV = 4.33 per ton	137	7,657	45,507	18	22,990	3,271	3,400	3,310	3,494	3,808	4,238	4,345	4,447	4,015
NRHVAC	Air-Cooled Screw Chiller COP = 3.08, IPLV = 3.36 per ton	43	1,514	7,018	3	3,546	504	524	511	539	587	654	670	686	619
NRHVAC	Air-Cooled Screw Chiller COP = 3.08, IPLV = 3.80 per ton	43	2,247	10,959	4	5,536	788	819	797	841	917	1,021	1,046	1,071	967
NRHVAC	Air-Cooled Screw Chiller COP = 3.08, IPLV = 4.00 per ton	43	2,526	12,577	5	6,354	904	940	915	966	1,052	1,171	1,201	1,229	1,110
NRHVAC	Air-Cooled Screw Chiller COP = 3.08, IPLV = 5.22 per ton	43	3,768	17,500	7	8,841	1,258	1,308	1,273	1,344	1,464	1,630	1,671	1,710	1,544
NRHVAC	Air-Cooled Screw Chiller COP = 3.36, IPLV = 3.66 per ton	43	1,817	12,940	5	6,537	930	967	941	993	1,083	1,205	1,236	1,264	1,142
NRHVAC	Air-Cooled Screw Chiller COP = 3.36, IPLV = 4.15 per ton	43	2,508	16,554	7	8,363	1,190	1,237	1,204	1,271	1,385	1,542	1,581	1,617	1,461
NRHVAC	Air-Cooled Screw Chiller COP = 3.36, IPLV = 4.42 per ton	43	2,823	18,037	7	9,112	1,296	1,348	1,312	1,385	1,509	1,680	1,722	1,762	1,591
NRHVAC	Air-Cooled Screw Chiller COP = 3.36, IPLV = 5.69 per ton	43	3,895	22,551	9	11,392	1,621	1,685	1,640	1,731	1,887	2,100	2,153	2,203	1,990
NRHVAC	Energy Star Room AC over 14,000 Btu hr	10	703	2,126	1	1,149	200	208	204	214	231	253	260	266	245
NRHVAC	Energy Star Room AC under 14,000 Btu hr	10	351	1,043	1	564	98	102	100	105	113	124	127	130	121
NRHVAC	HP 135,000 - 240,000 per ton	96	4,749	10,415	3	3,535	604	630	607	644	710	802	822	841	743
NRHVAC	HP 65,000 - 135,000 per ton	96	4,749	9,589	2	3,254	556	580	559	593	654	738	757	775	684
NRHVAC	HP greater than 240,000 per ton	51	2,544	7,126	2	2,419	413	431	415	441	486	549	563	576	508
NRHVAC	HP less than 65,000 1 Ph per ton	69	2,423	6,026	1	2,045	350	364	351	373	411	464	476	487	430
NRHVAC	HP less than 65,000 3 Ph per ton	69	1,938	3,738	1	1,269	217	226	218	231	255	288	295	302	267
NRHVAC	HP Water Heater 10-50 MBH	3	7,104	59,223	11	17,215	2,931	3,059	2,936	3,124	3,460	3,927	4,027	4,119	3,606
NRHVAC	HP Water Heater 100-300 MBH	3	17,760	394,825	74	114,767	19,542	20,393	19,577	20,828	23,066	26,182	26,845	27,463	24,039
NRHVAC	HP Water Heater 300-500 MBH	3	24,864	789,646	148	229,534	39,083	40,785	39,153	41,656	46,131	52,363	53,690	54,926	48,077
NRHVAC	HP Water Heater 50-100 MBH	3	12,432	148,058	28	43,037	7,328	7,647	7,341	7,810	8,650	9,818	10,067	10,299	9,014
NRHVAC	HP Water Heater greater than 500 MBH	3	31,968	1,184,471	222	344,301	58,625	61,178	58,730	62,484	69,196	78,545	80,535	82,389	72,116
NRHVAC	Packaged Terminal AC	302	4,273	8,926	4	3,717	642	667	649	685	747	831	852	872	788
NRHVAC	Setback Programmable Thermostat	548	38,768	403,602	76	84,026	21,136	22,057	21,174	22,528	24,948	28,318	29,036	29,704	26,001
NRHVAC	Thermal Storage	1	67,598	(0)	156	64,538	11,733	12,026	12,327	12,635	12,951	13,275	13,606	13,947	14,295
NRHVAC	Water-Cooled cent Chiller 150 - 300 ton 0.51 kW_ton with 0.3 kW_ton IPLV per ton	31	1,639	10,469	4	5,289	752	782	762	804	876	975	1,000	1,023	924
NRHVAC	Water-Cooled cent Chiller 150 - 300 ton 0.51 kW_ton with 0.36 kW_ton IPLV per ton	31	1,381	9,358	4	4,728	673	699	681	718	783	871	894	914	826
NRHVAC	Water-Cooled cent Chiller 150 - 300 ton 0.51 kW_ton with 0.39 kW_ton IPLV per ton	31	1,251	8,789	4	4,440	632	657	639	675	735	818	839	859	776
NRHVAC	Water-Cooled cent Chiller 150 - 300 ton 0.51 kW_ton with 0.41 kW_ton IPLV per ton	31	1,165	8,271	3	4,178	594	618	602	635	692	770	790	808	730
NRHVAC	Water-Cooled cent Chiller 150 - 300 ton 0.51 kW_ton with 0.48 kW_ton IPLV per ton	31	863	6,756	3	3,413	486	505	491	519	565	629	645	660	596
NRHVAC	Water-Cooled cent Chiller 150 - 300 ton 0.57 kW_ton with 0.34 kW_ton IPLV per ton	31	1,510	7,553	3	3,815	543	564	549	580	632	703	721	738	666
NRHVAC	Water-Cooled cent Chiller 150 - 300 ton 0.57 kW_ton with 0.4 kW_ton IPLV per ton	31	1,251	6,304	3	3,185	453	471	459	484	527	587	602	616	556
NRHVAC	Water-Cooled cent Chiller 150 - 300 ton 0.57 kW_ton with 0.43 kW_ton IPLV per ton	31	1,122	5,664	2	2,861	407	423	412	435	474	527	541	553	500
NRHVAC	Water-Cooled cent Chiller 150 - 300 ton 0.57 kW_ton with 0.46 kW_ton IPLV per ton	31	992	5,081	2	2,567	365	380	370	390	425	473	485	497	448
NRHVAC	Water-Cooled cent Chiller 150 - 300 ton 0.57 kW_ton with 0.54 kW_ton IPLV per ton	31	647	3,378	1	1,706	243	252	246	259	283	315	323	330	298
NRHVAC	Water-Cooled cent Chiller 150 - 300 ton 0.63 kW_ton with 0.38 kW_ton IPLV per ton	31	777	4,638	2	2,343	333	347	337	356	388	432	443	453	409
NRHVAC	Water-Cooled cent Chiller 150 - 300 ton 0.63 kW_ton with 0.45 kW_ton IPLV per ton	31	475	3,252	1	1,643	234	243	237	250	272	303	310	318	287
NRHVAC	Water-Cooled cent Chiller 150 - 300 ton 0.63 kW_ton with 0.48 kW_ton IPLV per ton	31	345	2,540	1	1,283	183	190	185	195	212	236	242	248	224
NRHVAC	Water-Cooled cent Chiller 150 - 300 ton 0.63 kW_ton with 0.51 kW_ton IPLV per ton	31	216	1,892	1	956	136	141	138	145	158	176	181	185	167
NRHVAC	Water-Cooled cent Chiller greater than 300 ton 0.46 kW_ton with 0.28 kW_ton IPLV p	111	5,628	34,922	14	17,642	2,510	2,609	2,540	2,681	2,922	3,252	3,334	3,412	3,081
NRHVAC	Water-Cooled cent Chiller greater than 300 ton 0.46 kW_ton with 0.33 kW_ton IPLV p	111	4,846	31,253	13	15,789	2,246	2,335	2,274	2,399	2,615	2,910	2,984	3,054	2,758
NRHVAC	Water-Cooled cent Chiller greater than 300 ton 0.46 kW_ton with 0.35 kW_ton IPLV p	111	4,533	29,376	12	14,841	2,111	2,195	2,137	2,255	2,458	2,736	2,805	2,870	2,592
NRHVAC	Water-Cooled cent Chiller greater than 300 ton 0.46 kW_ton with 0.37 kW_ton IPLV p	111	4,221	27,668	11	13,978	1,989	2,067	2,013	2,124	2,315	2,577	2,642	2,704	2,441
NRHVAC	Water-Cooled cent Chiller greater than 300 ton 0.46 kW_ton with 0.44 kW_ton IPLV p	111	3,126	22,353	9	11,292	1,607	1,670	1,626	1,716	1,870	2,082	2,134	2,184	1,972
NRHVAC	Water-Cooled cent Chiller greater than 300 ton 0.52 kW_ton with 0.31 kW_ton IPLV p	111	5,159	25,307	10	12,785	1,819	1,891	1,841	1,943	2,117	2,357	2,416	2,473	2,233
NRHVAC	Water-Cooled cent Chiller greater than 300 ton 0.52 kW_ton with 0.37 kW_ton IPLV p	111	4,221	21,190	9	10,705	1,523	1,583	1,541	1,627	1,773	1,973	2,023	2,070	1,870
NRHVAC	Water-Cooled cent Chiller greater than 300 ton 0.52 kW_ton with 0.39 kW_ton IPLV p	111	3,908	19,079	8	9,639	1,371	1,426	1,388	1,465	1,596	1,777	1,822	1,864	1,683

Duke Energy Carolinas
Work Papers for V3 Estimated Program and Avoided Costs
Docket Number E-7 Sub 979

NRHVAC	Water-Cooled cent Chiller greater than 300 ton 0.52 kW_ton with 0.42 kW_ton IPLV pe	111	3,439	17,155	7	8,667	1,233	1,282	1,248	1,317	1,435	1,598	1,638	1,676	1,514
NRHVAC	Water-Cooled cent Chiller greater than 300 ton 0.52 kW_ton with 0.49 kW_ton IPLV pe	111	2,345	11,177	5	5,646	803	835	813	858	935	1,041	1,067	1,092	986
NRHVAC	Water-Cooled cent Chiller greater than 300 ton 0.58 kW_ton with 0.35 kW_ton IPLV pe	111	2,657	15,696	6	7,930	1,128	1,173	1,142	1,205	1,313	1,462	1,499	1,534	1,385
NRHVAC	Water-Cooled cent Chiller greater than 300 ton 0.58 kW_ton with 0.41 kW_ton IPLV pe	111	1,720	11,121	5	5,618	799	831	809	854	930	1,036	1,062	1,087	981
NRHVAC	Water-Cooled cent Chiller greater than 300 ton 0.58 kW_ton with 0.44 kW_ton IPLV pe	111	1,251	8,777	4	4,434	631	656	638	674	734	817	838	858	774
NRHVAC	Water-Cooled cent Chiller greater than 300 ton 0.58 kW_ton with 0.47 kW_ton IPLV pe	111	782	6,643	3	3,356	477	496	483	510	556	619	634	649	586
NRHVAC	Water-Cooled Centrifugal Chiller less than 150 ton 0.56 kW_ton with 0.34 kW_ton IPLV	5	293	2,044	1	1,033	147	153	149	157	171	190	195	200	180
NRHVAC	Water-Cooled Centrifugal Chiller less than 150 ton 0.56 kW_ton with 0.4 kW_ton IPLV	5	248	1,830	1	925	132	137	133	141	153	170	175	179	161
NRHVAC	Water-Cooled Centrifugal Chiller less than 150 ton 0.56 kW_ton with 0.43 kW_ton IPLV	5	225	1,720	1	869	124	129	125	132	144	160	164	168	152
NRHVAC	Water-Cooled Centrifugal Chiller less than 150 ton 0.56 kW_ton with 0.46 kW_ton IPLV	5	203	1,620	1	819	116	121	118	124	136	151	155	158	143
NRHVAC	Water-Cooled Centrifugal Chiller less than 150 ton 0.56 kW_ton with 0.53 kW_ton IPLV	5	150	1,309	1	661	94	98	95	101	110	122	125	128	116
NRHVAC	Water-Cooled Centrifugal Chiller less than 150 ton 0.63 kW_ton with 0.38 kW_ton IPLV	5	278	1,482	1	748	106	111	108	114	124	138	141	145	131
NRHVAC	Water-Cooled Centrifugal Chiller less than 150 ton 0.63 kW_ton with 0.45 kW_ton IPLV	5	225	1,241	1	627	89	93	90	95	104	116	118	121	109
NRHVAC	Water-Cooled Centrifugal Chiller less than 150 ton 0.63 kW_ton with 0.48 kW_ton IPLV	5	203	1,117	0	564	80	83	81	86	93	104	107	109	99
NRHVAC	Water-Cooled Centrifugal Chiller less than 150 ton 0.63 kW_ton with 0.51 kW_ton IPLV	5	180	1,005	0	507	72	75	73	77	84	94	96	98	89
NRHVAC	Water-Cooled Centrifugal Chiller less than 150 ton 0.63 kW_ton with 0.6 kW_ton IPLV	5	113	655	0	331	47	49	48	50	55	61	63	64	58
NRHVAC	Water-Cooled Centrifugal Chiller less than 150 ton 0.7 kW_ton with 0.42 kW_ton IPLV	5	150	918	0	464	66	69	67	71	77	86	88	90	81
NRHVAC	Water-Cooled Centrifugal Chiller less than 150 ton 0.7 kW_ton with 0.5 kW_ton IPLV p	5	90	651	0	329	47	49	47	50	54	61	62	64	57
NRHVAC	Water-Cooled Centrifugal Chiller less than 150 ton 0.7 kW_ton with 0.53 kW_ton IPLV	5	68	514	0	260	37	38	37	39	43	48	49	50	45
NRHVAC	Water-Cooled Centrifugal Chiller less than 150 ton 0.7 kW_ton with 0.57 kW_ton IPLV	5	38	389	0	196	28	29	28	30	33	36	37	38	34
NRHVAC	Water-cooled screw chiller 150 - 300 ton 0.57 kW_ton with 0.34 kW_ton IPLV per ton	31	1,596	11,147	5	5,631	801	833	811	856	933	1,038	1,064	1,089	984
NRHVAC	Water-cooled screw chiller 150 - 300 ton 0.57 kW_ton with 0.37 kW_ton IPLV per ton	31	1,467	10,555	4	5,332	759	789	768	810	883	983	1,008	1,031	931
NRHVAC	Water-cooled screw chiller 150 - 300 ton 0.57 kW_ton with 0.4 kW_ton IPLV per ton	31	1,337	9,850	4	4,976	708	736	717	756	824	917	940	962	869
NRHVAC	Water-cooled screw chiller 150 - 300 ton 0.57 kW_ton with 0.43 kW_ton IPLV per ton	31	1,208	9,091	4	4,593	653	679	661	698	761	847	868	888	802
NRHVAC	Water-cooled screw chiller 150 - 300 ton 0.57 kW_ton with 0.45 kW_ton IPLV per ton	31	1,122	8,544	3	4,316	614	638	622	656	715	796	816	835	754
NRHVAC	Water-cooled screw chiller 150 - 300 ton 0.57 kW_ton with 0.51 kW_ton IPLV per ton	31	863	7,133	3	3,604	513	533	519	548	597	664	681	697	629
NRHVAC	Water-cooled screw chiller 150 - 300 ton 0.65 kW_ton with 0.39 kW_ton IPLV per ton	31	1,424	8,078	3	4,081	581	604	588	620	676	752	771	789	713
NRHVAC	Water-cooled screw chiller 150 - 300 ton 0.65 kW_ton with 0.42 kW_ton IPLV per ton	31	1,294	7,405	3	3,741	532	553	539	569	620	690	707	724	653
NRHVAC	Water-cooled screw chiller 150 - 300 ton 0.65 kW_ton with 0.45 kW_ton IPLV per ton	31	1,165	6,611	3	3,340	475	494	481	508	553	616	631	646	583
NRHVAC	Water-cooled screw chiller 150 - 300 ton 0.65 kW_ton with 0.48 kW_ton IPLV per ton	31	1,035	5,750	2	2,905	413	430	418	441	481	535	549	562	507
NRHVAC	Water-cooled screw chiller 150 - 300 ton 0.65 kW_ton with 0.51 kW_ton IPLV per ton	31	906	5,128	2	2,591	369	383	373	394	429	478	490	501	452
NRHVAC	Water-cooled screw chiller 150 - 300 ton 0.65 kW_ton with 0.57 kW_ton IPLV per ton	31	647	3,542	1	1,790	255	265	258	272	296	330	338	346	313
NRHVAC	Water-cooled screw chiller 150 - 300 ton 0.72 kW_ton with 0.43 kW_ton IPLV per ton	31	820	5,093	2	2,573	366	381	371	391	426	474	486	498	449
NRHVAC	Water-cooled screw chiller 150 - 300 ton 0.72 kW_ton with 0.47 kW_ton IPLV per ton	31	647	4,325	2	2,185	311	323	315	332	362	403	413	423	382
NRHVAC	Water-cooled screw chiller 150 - 300 ton 0.72 kW_ton with 0.5 kW_ton IPLV per ton	31	518	3,409	1	1,722	245	255	248	262	285	318	326	333	301
NRHVAC	Water-cooled screw chiller 150 - 300 ton 0.72 kW_ton with 0.54 kW_ton IPLV per ton	31	345	2,423	1	1,224	174	181	176	186	203	226	231	237	214
NRHVAC	Water-cooled screw chiller 150 - 300 ton 0.72 kW_ton with 0.57 kW_ton IPLV per ton	31	216	1,716	1	867	123	128	125	132	144	160	164	168	151
NRHVAC	Water-cooled screw chiller greater than 300 ton 0.51 kW_ton with 0.31 kW_ton IPLV p	111	5,471	36,136	15	18,255	2,597	2,700	2,629	2,774	3,024	3,365	3,450	3,531	3,189
NRHVAC	Water-cooled screw chiller greater than 300 ton 0.51 kW_ton with 0.33 kW_ton IPLV p	111	5,159	34,228	14	17,292	2,460	2,558	2,490	2,628	2,864	3,188	3,268	3,345	3,020
NRHVAC	Water-cooled screw chiller greater than 300 ton 0.51 kW_ton with 0.36 kW_ton IPLV p	111	4,690	31,954	13	16,143	2,297	2,388	2,325	2,453	2,674	2,976	3,051	3,122	2,820
NRHVAC	Water-cooled screw chiller greater than 300 ton 0.51 kW_ton with 0.38 kW_ton IPLV p	111	4,377	29,507	12	14,906	2,121	2,205	2,147	2,265	2,469	2,748	2,817	2,883	2,604
NRHVAC	Water-cooled screw chiller greater than 300 ton 0.51 kW_ton with 0.4 kW_ton IPLV pe	111	4,064	27,745	11	14,017	1,994	2,073	2,018	2,130	2,321	2,584	2,649	2,711	2,448
NRHVAC	Water-cooled screw chiller greater than 300 ton 0.51 kW_ton with 0.46 kW_ton IPLV p	111	3,126	23,193	9	11,717	1,667	1,733	1,687	1,781	1,941	2,160	2,214	2,266	2,046
NRHVAC	Water-cooled screw chiller greater than 300 ton 0.58 kW_ton with 0.35 kW_ton IPLV p	111	4,846	26,164	11	13,218	1,881	1,955	1,903	2,009	2,189	2,437	2,498	2,557	2,309
NRHVAC	Water-cooled screw chiller greater than 300 ton 0.58 kW_ton with 0.37 kW_ton IPLV p	111	4,533	24,015	10	12,132	1,726	1,794	1,747	1,844	2,009	2,236	2,293	2,347	2,119
NRHVAC	Water-cooled screw chiller greater than 300 ton 0.58 kW_ton with 0.4 kW_ton IPLV pe	111	4,064	21,457	9	10,840	1,542	1,603	1,561	1,647	1,795	1,998	2,049	2,097	1,893
NRHVAC	Water-cooled screw chiller greater than 300 ton 0.58 kW_ton with 0.43 kW_ton IPLV p	111	3,595	18,700	8	9,447	1,344	1,397	1,360	1,436	1,565	1,741	1,785	1,827	1,650
NRHVAC	Water-cooled screw chiller greater than 300 ton 0.58 kW_ton with 0.45 kW_ton IPLV p	111	3,283	16,715	7	8,444	1,201	1,249	1,216	1,283	1,399	1,557	1,596	1,633	1,475
NRHVAC	Water-cooled screw chiller greater than 300 ton 0.58 kW_ton with 0.51 kW_ton IPLV p	111	2,185	11,590	5	5,855	833	866	843	890	970	1,079	1,107	1,132	1,023
NRHVAC	Water-cooled screw chiller greater than 300 ton 0.64 kW_ton with 0.38 kW_ton IPLV p	111	2,814	16,253	7	8,211	1,168	1,214	1,182	1,248	1,360	1,514	1,552	1,588	1,434
NRHVAC	Water-cooled screw chiller greater than 300 ton 0.64 kW_ton with 0.42 kW_ton IPLV p	111	2,188	13,848	6	6,996	995	1,035	1,007	1,063	1,159	1,290	1,322	1,353	1,222
NRHVAC	Water-cooled screw chiller greater than 300 ton 0.64 kW_ton with 0.45 kW_ton IPLV p	111	1,720	10,997	4	5,556	790	822	800	844	920	1,024	1,050	1,075	970
NRHVAC	Water-cooled screw chiller greater than 300 ton 0.64 kW_ton with 0.48 kW_ton IPLV p	111	1,251	7,920	3	4,001	569	592	576	608	663	738	756	774	699
NRHVAC	Water-cooled screw chiller greater than 300 ton 0.64 kW_ton with 0.51 kW_ton IPLV p	111	782	5,688	2	2,874	409	425	414	437	476	530	543	556	502
NRHVAC	Water-cooled screw chiller less than 150 ton 0.63 kW_ton with 0.38 kW_ton IPLV per t	5	285	2,141	1	1,081	154	160	156	164	179	199	204	209	189
NRHVAC	Water-cooled screw chiller less than 150 ton 0.63 kW_ton with 0.41 kW_ton IPLV per t	5	263	2,027	1	1,024	146	151	147	156	170	189	193	198	179
NRHVAC	Water-cooled screw chiller less than 150 ton 0.63 kW_ton with 0.44 kW_ton IPLV per t	5	240	1,892	1	956	136	141	138	145	158	176	181	185	167
NRHVAC	Water-cooled screw chiller less than 150 ton 0.63 kW_ton with 0.47 kW_ton IPLV per t	5	218	1,746	1	882	125	130	127	134	146	163	167	171	154
NRHVAC	Water-cooled screw chiller less than 150 ton 0.63 kW_ton with 0.5 kW_ton IPLV per to	5	195	1,640	1	829	118	123	119	126	137	153	157	160	145
NRHVAC	Water-cooled screw chiller less than 150 ton 0.63 kW_ton with 0.56 kW_ton IPLV per t	5	150	1,370	1	692	98	102	100	105	115	128	131	134	121
NRHVAC	Water-cooled screw chiller less than 150 ton 0.71 kW_ton with 0.43 kW_ton IPLV per t	5	263	1,568	1	792	113	117	114	120	131	146	150	153	138
NRHVAC	Water-cooled screw chiller less than 150 ton 0.71 kW_ton with 0.46 kW_ton IPLV per t	5	240	1,436	1	725	103	107	104	110	120	134	137	140	127
NRHVAC	Water-cooled screw chiller less than 150 ton 0.71 kW_ton with 0.5 kW_ton IPLV per to	5	210	1,278	1	646	92	96	93	98	107	119	122	125	113
NRHVAC	Water-cooled screw chiller less than 150 ton 0.71 kW_ton with 0.53 kW_ton IPLV per t	5	188	1,108	0	560	80	83	81	85	93	103	106	108	98
NRHVAC	Water-cooled screw chiller less than 150 ton 0.71 kW_ton with 0.56 kW_ton IPLV per t	5	165	986	0	498	71	74	72	76	83	92	94	96	87
NRHVAC	Water-cooled screw chiller less than 150 ton 0.71 kW_ton with 0.63 kW_ton IPLV per t	5	113	689	0	348	50	51	50	53	58	64	66	67	61
NRHVAC	Water-cooled screw chiller less than 150 ton 0.79 kW_ton with 0.47 kW_ton IPLV per t	5	150	983	0	497	71	73	72	76	82	92	94	96	87
NRHVAC	Water-cooled screw chiller less than 150 ton 0.79 kW_ton with 0.51 kW_ton IPLV per t	5	120	837	0	423	60	63	61	64	70	78	80	82	74
NRHVAC	Water-cooled screw chiller less than 150 ton 0.79 kW_ton with 0.55 kW_ton IPLV per t	5	90	661	0	334	48	49	48	51	55	62	63	65	58
NRHVAC	Water-cooled screw chiller less than 150 ton 0.79 kW_ton with 0.59 kW_ton IPLV per t	5	60	473	0	239	34	35	34	36	40	44	45	46	42
NRHVAC	Water-cooled screw chiller less than 150 ton 0.79 kW_ton with 0.62 kW_ton IPLV per t	5	38	338	0	171	24	25	25	26	28	31	32	33	30
NRHVAC	Window Film	28,703	40,580	117,147	22	26,522	6,135	6,402	6,146	6,539	7,241	8,220	8,428	8,622	7,547
	Totals	39,341	603,058	4,745,056	1,398	1,732,053	284,527	296,242	286,817	303,660	333,047	373,614	383,065	391,968	349,579

Smart Saver® for Non-Residential Customers - Custom Rebate

Product Code	Name	Incremental Participants	Program Costs	Annual Cumulative kWh w/losses Net Free	Annual Cumulative Summer Coincident kW w/losses Net Free	Total Avoided Costs	2012 Annual Cost-Based Total Avoided Elec	2013 Annual Cost-Based Total Avoided Elec	2014 Annual Cost-Based Total Avoided Elec	2015 Annual Cost-Based Total Avoided Elec	2016 Annual Cost-Based Total Avoided Elec	2017 Annual Cost-Based Total Avoided Elec	2018 Annual Cost-Based Total Avoided Elec	2019 Annual Cost-Based Total Avoided Elec	2020 Annual Cost-Based Total Avoided Elec
NRPRSC	Custom Rebate	1,518	1,754,160	17,565,577	2,799	4,402,665	879,302	918,266	879,109	936,784	1,040,636	1,185,637	1,215,685	1,243,591	1,082,085
	Totals	1,518	1,754,160	17,565,577	2,799	4,402,665	879,302	918,266	879,109	936,784	1,040,636	1,185,637	1,215,685	1,243,591	1,082,085

Power Share

Product Code	Name	Incremental Participants	Program Costs	Annual Cumulative kWh w/losses Net Free	Annual Cumulative Summer Coincident kW w/losses Net Free	Total Avoided Costs	2012 Annual Cost-Based Avoided Elec Capacity	2013 Annual Cost-Based Avoided Elec Capacity	2014 Annual Cost-Based Avoided Elec Capacity	2015 Annual Cost-Based Avoided Elec Capacity	2016 Annual Cost-Based Avoided Elec Capacity	2017 Annual Cost-Based Avoided Elec Capacity	2018 Annual Cost-Based Avoided Elec Capacity	2019 Annual Cost-Based Avoided Elec Capacity	2020 Annual Cost-Based Avoided Elec Capacity
PWRSHR	PS 0_5	1	17,828	0	1,021	57,509	76,678	0	0	0	0	0	0	0	0
PWHSHR	PS CallOption 10_5	1	39,515	0	1,021	57,509	76,678	0	0	0	0	0	0	0	0
PWHSHR	PS CallOption 15_5	1	47,443	0	1,021	57,509	76,678	0	0	0	0	0	0	0	0
PWHSHR	PS CallOption 5_5	1	25,756	0	1,021	57,509	76,678	0	0	0	0	0	0	0	0
PWRSHR	PS Generator	11	626,806	0	11,500	647,717	863,623	0	0	0	0	0	0	0	0
PWRSHR	PS Mandatory	283	16,629,901	0	305,104	17,184,698	22,912,930	0	0	0	0	0	0	0	0
	Totals	297	17,387,248	0	320,688	18,062,449	24,083,265	0	0	0	0	0	0	0	0

2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec
27,009	29,169	28,823	0	0	0	0	0	0	0	0
2,318	2,504	2,474	0	0	0	0	0	0	0	0
341	369	364	0	0	0	0	0	0	0	0
22,981	24,819	24,525	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
5,199	5,614	5,548	0	0	0	0	0	0	0	0
25,921	27,994	27,661	0	0	0	0	0	0	0	0
230,545	248,986	246,028	0	0	0	0	0	0	0	0
82,514	89,112	88,055	0	0	0	0	0	0	0	0
20,267	21,805	21,603	0	0	0	0	0	0	0	0
7,067	7,603	7,533	0	0	0	0	0	0	0	0
63,006	68,046	67,237	0	0	0	0	0	0	0	0
1,193,578	1,289,043	1,273,734	0	0	0	0	0	0	0	0
60,190	65,004	64,232	0	0	0	0	0	0	0	0
818	884	873	0	0	0	0	0	0	0	0
6,702	7,239	7,153	0	0	0	0	0	0	0	0
15,090	16,296	16,103	0	0	0	0	0	0	0	0
8,289	8,952	8,846	0	0	0	0	0	0	0	0
991	1,071	1,057	0	0	0	0	0	0	0	0
3,272	3,534	3,492	0	0	0	0	0	0	0	0
1,585	1,713	1,692	0	0	0	0	0	0	0	0
2,792	3,016	2,980	0	0	0	0	0	0	0	0
9,071	9,798	9,681	0	0	0	0	0	0	0	0
5,136	5,498	5,466	0	0	0	0	0	0	0	0
1,783	1,927	1,903	0	0	0	0	0	0	0	0
7,496	8,095	7,999	0	0	0	0	0	0	0	0
2,701	2,918	2,882	0	0	0	0	0	0	0	0
1,011	0	0	0	0	0	0	0	0	0	0
49,095	53,019	52,392	0	0	0	0	0	0	0	0
8,792	9,495	9,382	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
11,616	12,666	12,432	13,388	12,620	13,152	14,812	0	0	0	0
23,638	25,660	25,265	27,112	25,713	26,763	29,940	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
109	117	116	123	119	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
28,754	0	0	0	0	0	0	0	0	0	0
184,910	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
1,320	1,425	1,408	0	0	0	0	0	0	0	0
25	27	26	0	0	0	0	0	0	0	0
613	662	654	0	0	0	0	0	0	0	0
554	599	592	0	0	0	0	0	0	0	0
741	801	791	0	0	0	0	0	0	0	0
108	117	116	0	0	0	0	0	0	0	0
802	866	855	0	0	0	0	0	0	0	0
830	896	886	0	0	0	0	0	0	0	0
1,530	1,653	1,633	0	0	0	0	0	0	0	0
285	307	304	0	0	0	0	0	0	0	0
3,410	3,682	3,639	0	0	0	0	0	0	0	0
846	913	902	0	0	0	0	0	0	0	0
667	721	712	0	0	0	0	0	0	0	0
599	647	639	0	0	0	0	0	0	0	0
996	1,076	1,063	0	0	0	0	0	0	0	0
809	874	864	0	0	0	0	0	0	0	0
1,050	1,134	1,120	0	0	0	0	0	0	0	0
3,437	3,712	3,668	0	0	0	0	0	0	0	0
36,781	39,720	39,250	0	0	0	0	0	0	0	0
36,781	39,720	39,250	0	0	0	0	0	0	0	0
99,820	107,801	106,523	0	0	0	0	0	0	0	0
9,611	10,379	10,256	0	0	0	0	0	0	0	0
7,947	8,583	8,481	0	0	0	0	0	0	0	0
170	183	181	0	0	0	0	0	0	0	0
9,669	10,443	10,319	0	0	0	0	0	0	0	0
2,333,989	2,288,903	2,261,664	40,624	38,452	39,915	44,752	0	0	0	0

2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec
168	180	179	190	183	190	0	0	0	0	0
2,241	2,410	2,388	2,544	2,444	2,537	0	0	0	0	0
1,680	1,807	1,791	1,907	1,832	1,902	0	0	0	0	0
150	161	159	170	163	169	0	0	0	0	0
1,494	1,606	1,592	1,695	1,629	1,691	0	0	0	0	0
224	241	239	254	244	254	0	0	0	0	0
373	401	398	424	407	423	0	0	0	0	0
1,400	1,506	1,492	1,590	1,527	1,585	0	0	0	0	0
46,793	0	0	0	0	0	0	0	0	0	0
123,504	0	0	0	0	0	0	0	0	0	0
10,361	11,183	11,055	11,810	11,287	11,730	0	0	0	0	0
188,388	19,495	19,293	20,584	19,717	20,481	0	0	0	0	0

2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0

2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec
9	10	10	0	0	0	0	0	0	0	0
14,637	15,850	15,633	0	0	0	0	0	0	0	0
1,497	1,621	1,599	0	0	0	0	0	0	0	0
81	88	87	0	0	0	0	0	0	0	0
156	170	167	0	0	0	0	0	0	0	0
68	74	73	0	0	0	0	0	0	0	0
287	313	307	0	0	0	0	0	0	0	0
27	29	29	0	0	0	0	0	0	0	0
29	32	31	0	0	0	0	0	0	0	0
29	32	31	0	0	0	0	0	0	0	0
36	40	39	0	0	0	0	0	0	0	0
35	38	38	0	0	0	0	0	0	0	0
70	76	75	0	0	0	0	0	0	0	0
24	26	26	0	0	0	0	0	0	0	0
152	165	162	0	0	0	0	0	0	0	0
18	19	19	0	0	0	0	0	0	0	0
32	35	34	0	0	0	0	0	0	0	0
11	12	12	0	0	0	0	0	0	0	0
46	50	49	0	0	0	0	0	0	0	0
727	790	777	0	0	0	0	0	0	0	0
1,083	1,173	1,157	0	0	0	0	0	0	0	0
4,974	5,400	5,317	0	0	0	0	0	0	0	0
1,133	1,230	1,211	0	0	0	0	0	0	0	0
2,673	2,902	2,858	0	0	0	0	0	0	0	0
350	381	374	0	0	0	0	0	0	0	0
522	570	559	0	0	0	0	0	0	0	0
751	819	804	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
6,130	6,638	6,547	0	0	0	0	0	0	0	0
6,827	7,393	7,292	0	0	0	0	0	0	0	0
7,579	8,207	8,094	0	0	0	0	0	0	0	0
6,927	7,501	7,398	0	0	0	0	0	0	0	0
154	0	0	0	0	0	0	0	0	0	0
57,076	61,687	60,808	0	0	0	0	0	0	0	0

2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec
5,907	6,320	6,286	6,669	6,449	6,686	0	0	0	0	0
4,840	5,178	5,150	5,464	5,284	5,478	0	0	0	0	0
1,666	1,783	1,773	1,881	1,819	1,886	0	0	0	0	0
5,571	5,961	5,928	6,289	6,082	6,306	0	0	0	0	0
506	541	538	571	552	573	0	0	0	0	0
303	324	322	342	331	343	0	0	0	0	0
409	437	435	462	446	463	507	500	521	534	548
3,488	3,732	3,712	3,938	3,808	3,948	4,322	4,266	4,447	4,558	4,672
6,328	6,771	6,734	7,145	6,910	7,164	7,842	7,740	8,068	8,269	8,476
3,832	4,100	4,077	4,326	4,184	4,337	4,748	4,686	4,885	5,007	5,132
662	709	705	748	723	750	821	810	844	865	887
993	1,063	1,057	1,121	1,085	1,124	1,231	1,215	1,266	1,298	1,330
1,371	1,467	1,459	1,548	1,497	1,552	1,699	1,676	1,747	1,791	1,836
1,555	1,664	1,655	1,756	1,698	1,761	1,927	1,902	1,983	2,033	2,083
1,221	1,306	1,299	1,378	1,333	1,382	1,513	1,493	1,556	1,595	1,635
1,524	1,631	1,622	1,721	1,665	1,726	1,889	1,864	1,944	1,992	2,042
1,871	2,002	1,991	2,112	2,042	2,117	2,318	2,288	2,385	2,444	2,505
2,040	2,183	2,171	2,303	2,227	2,309	2,528	2,495	2,601	2,666	2,732
581	622	618	656	634	658	720	711	741	759	778
3,695	3,953	3,932	4,171	4,034	4,182	4,578	4,519	4,710	4,828	4,948
5,023	5,375	5,346	5,671	5,485	5,686	6,225	6,144	6,404	6,564	6,728
4,291	4,591	4,566	4,844	4,685	4,857	5,317	5,247	5,470	5,607	5,747
662	708	704	747	723	749	820	809	844	865	886
1,033	1,106	1,100	1,167	1,128	1,170	1,280	1,264	1,317	1,350	1,384
1,186	1,269	1,262	1,339	1,295	1,342	1,469	1,450	1,512	1,549	1,588
1,650	1,765	1,756	1,863	1,802	1,868	2,045	2,018	2,103	2,156	2,210
1,220	1,305	1,298	1,377	1,332	1,381	1,512	1,492	1,555	1,594	1,634
1,561	1,670	1,661	1,762	1,704	1,767	1,934	1,909	1,990	2,039	2,090
1,701	1,820	1,810	1,920	1,857	1,925	2,107	2,080	2,168	2,222	2,278
2,126	2,275	2,263	2,400	2,321	2,407	2,635	2,600	2,711	2,778	2,848
260	276	276	291	285	295	0	0	0	0	0
128	136	136	143	140	145	0	0	0	0	0
800	862	853	911	872	906	0	0	0	0	0
736	794	785	838	802	834	0	0	0	0	0
547	590	584	623	596	620	0	0	0	0	0
463	499	494	527	504	524	0	0	0	0	0
287	309	306	327	313	325	0	0	0	0	0
3,895	4,212	4,158	4,448	4,241	4,409	0	0	0	0	0
25,965	28,077	27,719	29,655	28,272	29,395	0	0	0	0	0
51,929	56,154	55,438	59,310	56,544	58,790	0	0	0	0	0
9,737	10,529	10,395	11,121	10,602	11,023	0	0	0	0	0
77,893	84,232	83,157	88,966	84,815	88,186	0	0	0	0	0
842	900	896	950	919	953	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
14,653	15,019	15,394	15,779	16,174	16,578	0	0	0	0	0
987	1,056	1,050	1,114	1,078	1,117	1,223	1,207	1,258	1,290	1,322
882	944	939	996	963	999	1,093	1,079	1,125	1,153	1,182
829	887	882	936	905	938	1,027	1,013	1,056	1,083	1,110
780	834	830	880	851	883	966	954	994	1,019	1,045
637	682	678	719	695	721	789	779	812	832	853
712	762	758	804	778	806	882	871	908	931	954
594	636	632	671	649	673	737	727	758	777	796
534	571	568	603	583	605	662	653	681	698	715
479	513	510	541	523	542	594	586	611	626	642
318	341	339	360	348	360	395	389	406	416	427
437	468	465	494	478	495	542	535	558	571	586
307	328	326	346	335	347	380	375	391	401	411
239	256	255	270	261	271	297	293	305	313	321
178	191	190	201	195	202	221	218	227	233	239
3,293	3,523	3,504	3,717	3,595	3,727	4,080	4,027	4,198	4,302	4,410
2,947	3,153	3,136	3,327	3,217	3,336	3,651	3,604	3,757	3,850	3,947
2,770	2,964	2,947	3,127	3,024	3,135	3,432	3,387	3,531	3,619	3,710
2,609	2,791	2,776	2,945	2,848	2,953	3,233	3,190	3,326	3,409	3,494
2,107	2,255	2,243	2,379	2,301	2,386	2,612	2,578	2,687	2,754	2,823
2,386	2,553	2,539	2,694	2,605	2,701	2,957	2,918	3,042	3,118	3,196
1,998	2,138	2,126	2,256	2,181	2,262	2,476	2,443	2,547	2,611	2,676
1,799	1,925	1,914	2,031	1,964	2,036	2,229	2,200	2,293	2,351	2,409

1,617	1,731	1,721	1,826	1,766	1,831	2,004	1,978	2,062	2,114	2,166
1,054	1,128	1,121	1,190	1,151	1,193	1,306	1,289	1,343	1,377	1,411
1,480	1,583	1,575	1,671	1,616	1,675	1,834	1,810	1,887	1,934	1,982
1,048	1,122	1,116	1,184	1,145	1,187	1,299	1,282	1,337	1,370	1,404
828	885	881	934	904	937	1,025	1,012	1,055	1,081	1,108
626	670	666	707	684	709	776	766	798	818	839
193	206	205	218	210	218	239	236	246	252	258
173	185	184	195	188	195	214	211	220	225	231
162	174	173	183	177	184	201	198	207	212	217
153	163	163	172	167	173	189	187	195	200	205
123	132	131	139	135	140	153	151	157	161	165
140	149	149	158	153	158	173	171	178	183	187
117	125	124	132	128	132	145	143	149	153	157
105	113	112	119	115	119	131	129	134	138	141
95	101	101	107	103	107	117	116	121	124	127
62	66	66	70	67	70	76	75	79	81	83
87	93	92	98	95	98	107	106	110	113	116
61	66	65	69	67	69	76	75	78	80	82
48	52	52	55	53	55	60	59	62	63	65
37	39	39	41	40	41	45	45	47	48	49
1,051	1,125	1,118	1,186	1,147	1,190	1,302	1,285	1,340	1,373	1,408
995	1,065	1,059	1,123	1,087	1,126	1,233	1,217	1,269	1,300	1,333
929	994	988	1,048	1,014	1,051	1,151	1,136	1,184	1,214	1,244
857	917	912	968	936	970	1,062	1,048	1,093	1,120	1,148
806	862	857	909	880	912	998	985	1,027	1,053	1,079
673	720	716	759	734	761	833	823	857	879	901
762	815	810	860	832	862	944	931	971	995	1,020
698	747	743	788	762	790	865	854	890	912	935
623	667	663	704	681	706	772	762	795	814	835
542	580	577	612	592	614	672	663	691	708	726
484	517	515	546	528	547	599	591	616	632	648
334	357	355	377	365	378	414	408	426	436	447
480	514	511	542	524	544	595	587	612	627	643
408	436	434	460	445	462	505	499	520	533	546
321	344	342	363	351	364	398	393	410	420	431
228	244	243	258	249	259	283	279	291	299	306
162	173	172	183	177	183	201	198	206	211	217
3,407	3,646	3,626	3,846	3,720	3,857	4,222	4,167	4,343	4,452	4,563
3,227	3,453	3,434	3,643	3,524	3,653	3,999	3,947	4,114	4,217	4,322
3,013	3,224	3,206	3,401	3,290	3,410	3,733	3,685	3,841	3,937	4,035
2,782	2,977	2,960	3,141	3,038	3,149	3,447	3,402	3,547	3,635	3,726
2,616	2,799	2,784	2,953	2,856	2,961	3,242	3,199	3,335	3,418	3,504
2,187	2,340	2,327	2,469	2,388	2,475	2,710	2,674	2,788	2,857	2,929
2,467	2,640	2,625	2,785	2,693	2,792	3,057	3,017	3,145	3,223	3,304
2,264	2,423	2,409	2,556	2,472	2,563	2,806	2,769	2,887	2,959	3,033
2,023	2,165	2,153	2,284	2,209	2,290	2,507	2,474	2,579	2,644	2,710
1,763	1,887	1,876	1,991	1,925	1,996	2,185	2,156	2,248	2,304	2,362
1,576	1,686	1,677	1,779	1,721	1,784	1,953	1,927	2,009	2,059	2,111
1,093	1,169	1,163	1,234	1,193	1,237	1,354	1,336	1,393	1,428	1,464
1,532	1,640	1,631	1,730	1,673	1,735	1,899	1,874	1,954	2,002	2,053
1,306	1,397	1,389	1,474	1,426	1,478	1,618	1,597	1,665	1,706	1,749
1,037	1,109	1,103	1,171	1,132	1,174	1,285	1,268	1,322	1,355	1,389
747	799	795	843	815	845	925	913	952	976	1,000
536	574	571	606	586	607	665	656	684	701	718
202	216	215	228	220	228	250	247	257	264	270
191	204	203	216	209	216	237	234	244	250	256
178	191	190	201	195	202	221	218	227	233	239
165	176	175	186	180	186	204	201	210	215	220
155	165	165	175	169	175	192	189	197	202	207
129	138	137	146	141	146	160	158	165	169	173
148	158	157	167	161	167	183	181	189	193	198
135	145	144	153	148	153	168	166	173	177	181
121	129	128	136	132	136	149	147	154	157	161
104	112	111	118	114	118	129	128	133	137	140
93	100	99	105	102	105	115	114	119	122	125
65	70	69	73	71	74	81	79	83	85	87
93	99	99	105	101	105	115	113	118	121	124
79	84	84	89	86	89	98	96	101	103	106
62	67	66	70	68	71	77	76	80	81	84
45	48	47	50	49	50	55	55	57	58	60
32	34	34	36	35	36	39	39	41	42	43
8,151	0	0	0	0	0	0	0	0	0	0
347,053	363,913	361,031	384,105	369,699	383,649	163,542	161,411	168,251	172,457	176,769

2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec	Annual Cost-Based Total Avoided Elec
1,171,202	1,269,053	1,251,112	0	0	0	0	0	0	0	0
1,171,202	1,269,053	1,251,112	0	0	0	0	0	0	0	0

2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Annual Cost-Based Avoided Elec Capacity	Annual Cost-Based Avoided Elec Capacity	Annual Cost-Based Avoided Elec Capacity	Annual Cost-Based Avoided Elec Capacity	Annual Cost-Based Avoided Elec Capacity	Annual Cost-Based Avoided Elec Capacity	Annual Cost-Based Avoided Elec Capacity	Annual Cost-Based Avoided Elec Capacity	Annual Cost-Based Avoided Elec Capacity	Annual Cost-Based Avoided Elec Capacity	Annual Cost-Based Avoided Elec Capacity
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0

Duke Energy Carolinas
Work Papers for V3 Estimated DE Carolinas Lost Revenue
Docket Number E-7 Sub 979

Residential	Year 2 of 2011	Year 1 of 2012
Residential Energy Assessments	$ 372,300.44	$ 193,627.19
Home Energy Comparison Report	$ -	$ -
Home Retrofit	$ -	$ 58,574.26
Residential Smart Saver	$ 12,514,040.20	$ 1,803,928.92
Low Income and Weatherization Assistance	$ -	$ 11,240.17
Energy Efficiency Programs for Schools	$ 295,447.30	$ 159,541.54
Total Lost Revenues	$ 13,181,787.94	$ 2,226,912.09

kWh (Net of Free Ridership)	Year 2 of 2011	Year 1 of 2012
Residential Energy Assessments	6,864,525	3,570,124
Home Energy Comparison Report		-
Home Retrofit	-	1,080,000
Residential Smart Saver	230,735,541	33,261,082
Low Income and Weatherization Assistance	-	207,248
Energy Efficiency Programs for Schools	5,447,497	2,941,648
Total kWh	243,047,563	41,060,102
Residential kWh Lost Revenue Rate (Cents per kWh)	5.42	5.42

Non-Residential	Year 2 of 2011	Year 1 of 2012
Smart Saver® for Non-Residential Customers Lighting	$ 1,476,795.92	$ 731,735.06
Smart Saver® for Non-Residential Customers Pumps and Motors	60,005.71	34,982.90
Smart Saver® for Non-Residential Customers - Other Prescriptive	362.52	203.93
Smart Saver® for Non-Residential Customers - Energy Star Food Service Products	15,555.21	8,748.94
Smart Saver® for Non-Residential Customers - HVAC	86,975.91	62,507.72
Smart Saver® for Non-Residential Customers - Custom Rebate	375,664.08	202,228.69
Smart Energy Now	1,059,885.15	-
Total Lost Revenues	$ 3,075,244.49	$ 1,040,407.24

kWh (Net of Free Ridership)	Year 2 of 2011	Year 1 of 2012
Smart Saver® for Non-Residential Customers Lighting	37,826,739	19,912,961
Smart Saver® for Non-Residential Customers Pumps and Motors	2,047,048	1,249,281
Smart Saver® for Non-Residential Customers - Other Prescriptive	12,427	7,382
Smart Saver® for Non-Residential Customers - Energy Star Food Service Products	592,201	350,921
Smart Saver® for Non-Residential Customers - HVAC	2,862,433	2,196,785
Smart Saver® for Non-Residential Customers - Custom Rebate	14,342,525	8,132,211
Smart Energy Now	20,345,987	
Total kWh	78,029,360	31,849,541
Non Residential kWh Lost Revenue Rate (Cents per kWh)	0.83	0.83

	Year 2 of 2011	Year 1 of 2012
Smart Saver® for Non-Residential Customers Lighting	$ 314,291.29	$ 165,450.95
Smart Saver® for Non-Residential Customers Pumps and Motors	$ 17,008.32	$ 10,379.91
Smart Saver® for Non-Residential Customers - Other Prescriptive	$ 103.25	$ 61.33
Smart Saver® for Non-Residential Customers - Energy Star Food Service Products	$ 4,920.43	$ 2,915.70
Smart Saver® for Non-Residential Customers - HVAC	$ 23,783.11	$ 18,252.44
Smart Saver® for Non-Residential Customers - Custom Rebate	$ 119,167.83	$ 67,568.16
Smart Energy Now	$ 169,048.85	$ -
	$ 648,323.08	$ 264,628.50

kW	Year 2 of 2011	Year 1 of 2012
Smart Saver® for Non-Residential Customers Lighting	123,036.79	59,934
Smart Saver® for Non-Residential Customers Pumps and Motors	4,550.74	2,604
Smart Saver® for Non-Residential Customers - Other Prescriptive	27.44	15
Smart Saver® for Non-Residential Customers - Energy Star Food Service Products	1,125.56	617
Smart Saver® for Non-Residential Customers - HVAC	6,688.18	4,684
Smart Saver® for Non-Residential Customers - Custom Rebate	27,146.97	14,252
Smart Energy Now	94,284	
Total kW	256,860	82,107
Non Residential kWh Lost Revenue Rate ($ per kW)	9.45	9.45

	Year 2 of 2011	Year 1 of 2012
Smart Saver® for Non-Residential Customers Lighting	$ 1,162,504.64	$ 566,284.10
Smart Saver® for Non-Residential Customers Pumps and Motors	$ 42,997.39	$ 24,602.99
Smart Saver® for Non-Residential Customers - Other Prescriptive	$ 259.27	$ 142.60
Smart Saver® for Non-Residential Customers - Energy Star Food Service Products	$ 10,634.78	$ 5,833.23
Smart Saver® for Non-Residential Customers - HVAC	$ 63,192.80	$ 44,255.28
Smart Saver® for Non-Residential Customers - Custom Rebate	$ 256,496.24	$ 134,660.53
Smart Energy Now	$ 890,836.30	$ -
	$ 2,426,921.40	$ 775,778.74

Lost Revenue Calculation for North Carolina Residential Vintage 1 True Up

kWh	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09
Residential Energy Assessments	5,411.14	13,767.58	25,617.29	46,439.90	73,290.11	97,263.51	132,401.67
Energy Efficiency Education Program for Schools	-	-	-	-	919.80	968.21	50,250.18
Low Income Energy Efficiency and Weatherization Assistance	-	-	-	5,929.44	5,929.44	78,061.86	104,499.54
Residential Energy Assessments	-	-	-	462.39	20,073.05	126,041.35	176,196.78
Residential Energy Assessments	-	-	-	-	380.79	33,536.68	398,278.69
Smart Saver® for Residential Customers	-	-	-	-	345,117.75	446,824.83	691,772.26
Smart Saver® for Residential Customers	-	-	-	-	-	-	-
Smart Saver® for Residential Customers	1,210.38	5,209.88	9,577.75	18,418.75	27,733.38	37,258.50	50,888.38
Smart Saver® for Residential Customers	1,420.88	10,893.38	22,681.38	38,626.75	56,361.38	75,937.88	102,829.25
Low Income Energy Efficiency and Weatherization Assistance	-	-	-	-	-	-	-
	8,042.39	29,870.83	57,876.42	109,877.23	529,805.69	895,892.82	1,707,116.74
LM Rate (cents / kwh)	5.157509407	5.157509407	5.157509407	5.325441254	5.325441254	5.325441254	5.325441254
	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09
Residential Energy Assessments	279.08	710.06	1,321.21	2,473.13	3,903.02	5,179.71	7,050.97
Energy Efficiency Education Program for Schools	-	-	-	-	48.98	51.56	2,676.04
Low Income Energy Efficiency and Weatherization Assistance	-	-	-	315.77	315.77	4,157.14	5,565.06
Residential Energy Assessments	-	-	-	24.62	1,068.98	6,712.26	9,383.26
Residential Energy Assessments	-	-	-	-	20.28	1,785.98	21,210.10
Smart Saver® for Residential Customers	-	-	-	-	18,379.04	23,795.39	36,839.93
Smart Saver® for Residential Customers	-	-	-	-	-	-	-
Smart Saver® for Residential Customers	62.43	268.70	493.97	980.88	1,476.92	1,984.18	2,710.03
Smart Saver® for Residential Customers	73.28	561.83	1,169.79	2,057.04	3,001.49	4,044.03	5,476.11
Low Income Energy Efficiency and Weatherization Assistance	-	-	-	-	-	-	-
Total 2009	**414.79**	**1,540.59**	**2,984.98**	**5,851.45**	**28,214.49**	**47,710.25**	**90,911.50**

kWh	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10
Residential Energy Assessments	170,348.13	203,225.94	247,405.49	304,325.20	331,449.39	356,929.69	382,615.47	401,520.21	422,342.82	438,165.27	451,042.41	464,878.48
Energy Efficiency Education Program for Schools	106,503.28	134,097.31	147,168.16	151,428.29	164,886.44	194,755.76	202,307.81	202,453.04	205,260.86	357,173.26	427,901.12	473,358.65
Low Income Energy Efficiency and Weatherization Assistance	122,614.24	154,056.58	219,606.79	241,801.38	273,624.51	273,624.51	493,122.50	493,122.50	493,122.50	485,017.12	581,683.27	581,574.47
Residential Energy Assessments	192,353.13	208,455.09	225,318.63	225,617.82	247,513.22	257,631.35	261,303.24	266,552.70	273,706.11	272,862.93	273,488.51	274,005.30
Residential Energy Assessments	769,602.93	875,788.82	878,835.13	879,351.92	880,494.29	880,983.88	881,364.67	881,582.26	881,935.85	880,684.68	880,739.08	880,847.88
Smart Saver® for Residential Customers	777,513.38	850,207.92	898,332.47	1,027,329.47	1,221,069.76	2,659,692.77	7,823,194.84	10,436,381.42	15,634,879.86	17,400,442.45	22,588,568.92	27,166,276.10
Smart Saver® for Residential Customers	-	-	-	-	-	-	39,598.94	66,012.20	89,407.13	137,974.45	149,111.57	159,063.70
Smart Saver® for Residential Customers	62,729.00	69,412.38	77,621.88	87,515.38	96,987.88	112,091.25	138,035.38	163,242.75	183,661.25	202,974.63	226,919.00	252,336.88
Smart Saver® for Residential Customers	132,036.13	155,454.25	182,556.13	212,184.00	236,654.63	270,229.38	323,117.50	367,375.13	408,106.88	441,944.75	482,202.88	529,460.13
Low Income Energy Efficiency and Weatherization Assistance	-	-	-	-	-	-	-	-	-	-	-	-
	2,333,700.21	2,650,698.28	2,876,844.68	3,129,553.45	3,452,680.10	5,005,938.57	10,544,660.35	13,278,242.21	18,592,423.25	20,617,239.53	26,061,656.75	30,781,801.58
LM Rate (cents / kwh)	5.565598597	5.565598597	5.565598597	5.565598597	5.565598597	5.565598597	5.565598597	5.565598597	5.051942536	5.051942536	5.051942536	5.051942536
	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10
Residential Energy Assessments	9,480.89	11,310.74	13,769.60	16,937.52	18,447.14	19,865.27	21,294.84	22,347.00	21,336.52	22,135.86	22,786.40	23,485.39
Energy Efficiency Education Program for Schools	5,927.54	7,463.32	8,190.79	8,427.89	9,176.92	10,839.32	11,259.64	11,267.72	10,369.66	18,044.19	21,617.32	23,913.81
Low Income Energy Efficiency and Weatherization Assistance	6,824.22	8,574.17	12,222.43	13,457.69	15,228.84	15,228.84	27,445.22	27,445.22	24,912.27	24,502.79	29,386.30	29,380.81
Residential Energy Assessments	10,705.60	11,601.77	12,540.33	12,556.98	13,775.59	14,338.73	14,543.09	14,835.25	13,827.48	13,784.88	13,816.48	13,842.59
Residential Energy Assessments	42,833.01	48,742.89	48,912.44	48,941.20	49,004.78	49,032.03	49,053.22	49,065.33	44,554.89	44,491.68	44,494.43	44,499.93
Smart Saver® for Residential Customers	43,273.27	47,319.16	49,997.58	57,177.03	67,959.84	148,027.82	435,407.62	580,847.10	789,865.15	879,060.35	1,141,161.52	1,372,424.66
Smart Saver® for Residential Customers	-	-	-	-	-	-	2,203.92	3,673.97	4,516.80	6,970.39	7,533.03	8,035.81
Smart Saver® for Residential Customers	3,491.24	3,863.21	4,320.12	4,870.75	5,397.96	6,238.55	7,682.49	9,085.44	9,278.46	10,254.16	11,463.82	12,747.91
Smart Saver® for Residential Customers	7,348.60	8,651.96	10,160.34	11,809.31	13,171.25	15,039.88	17,983.42	20,446.62	20,617.32	22,326.79	24,360.61	26,748.02
Low Income Energy Efficiency and Weatherization Assistance	-	-	-	-	-	-	-	-	-	-	-	-
Total 2010	**129,884.39**	**147,527.23**	**160,113.63**	**174,178.38**	**192,162.32**	**278,610.45**	**586,873.47**	**739,013.66**	**939,278.54**	**1,041,571.09**	**1,316,619.92**	**1,555,078.93**

Lost Revenue Calculation for North Carolina Non Residential Vintage 1 True Up

Non Residential

kWh	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10
Custom	-	-	-	-	1,478.89	1,478.89	1,478.89	1,478.89	52,062.63	88,631.58	116,057.06	116,960.20	116,960.20	446,730.95	499,887.75	499,887.75	762,690.00	932,347.96	1,334,635.26
Energy Star Food Service Products	-	804.71	1,155.83	4,110.23	8,809.26	16,491.80	22,172.99	26,053.55	44,728.12	46,842.13	47,264.26	52,914.45	62,504.94	62,809.21	66,196.52	69,611.85	70,416.56	72,124.36	74,958.96
HVAC	110.81	2,786.23	2,870.07	4,944.96	22,925.79	35,632.59	45,034.64	60,384.28	63,335.47	81,273.99	88,671.89	101,648.06	118,920.90	119,496.11	138,896.20	208,861.92	220,157.03	251,400.86	270,369.79
Lighting	16,712.41	80,018.62	416,839.05	811,488.30	889,492.33	1,027,242.20	1,198,019.35	1,458,394.16	1,594,162.47	1,761,742.68	1,893,231.69	2,000,507.67	2,176,686.82	2,278,567.33	2,440,019.85	2,565,161.31	2,710,819.10	2,905,502.99	3,254,637.64
Motors/Pumps/VFD	-	-	-	15,997.39	15,997.39	21,915.62	27,810.10	39,661.29	65,620.75	138,482.31	142,155.08	155,242.25	156,623.19	163,696.56	166,804.15	166,945.55	169,613.16	192,135.13	202,718.83
Process Equipment	-	-	-	-	-	-	-	-	-	-	13.41	13.41	13.41	13.41	13.41	13.41	13.41	33.52	33.52
Total kWh	16,823.22	83,609.57	420,864.95	836,540.88	938,703.66	1,102,761.09	1,294,515.96	1,585,972.17	1,819,909.43	2,116,972.69	2,287,393.39	2,427,286.04	2,631,709.45	3,071,313.57	3,311,817.88	3,510,481.79	3,933,709.26	4,353,544.82	5,137,354.00
LM Rate (cents per kwh)	**0.96972**	**0.96972**	**0.96972**	**1.14174**	**1.14174**	**1.14174**	**1.14174**	**1.09513**	**1.09513**	**1.09513**	**1.09513**	**1.09513**	**1.09513**	**1.09513**	**1.09513**	**0.61206**	**0.61206**	**0.61206**	**0.61206**
LM kWh$	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10
Custom	-	-	-	-	16.89	16.89	16.89	16.20	570.16	970.63	1,270.98	1,280.87	1,280.87	4,892.30	5,474.44	3,059.60	4,668.09	5,706.50	8,168.72
Energy Star Food Service Products	-	7.80	11.21	46.93	100.58	188.29	253.16	285.32	489.83	512.98	517.61	579.48	684.51	687.84	724.94	426.06	430.99	441.44	458.79
HVAC	1.07	27.02	27.83	56.46	261.75	406.83	514.18	661.29	693.61	890.06	971.08	1,113.18	1,302.34	1,308.64	1,521.10	1,278.35	1,347.49	1,538.72	1,654.82
Lighting	162.06	775.95	4,042.16	9,265.08	10,155.68	11,728.43	13,678.26	15,971.36	17,458.20	19,293.43	20,733.41	21,908.22	23,837.62	24,953.34	26,721.46	15,700.23	16,591.74	17,783.32	19,920.22
Motors/Pumps/VFD	-	-	-	182.65	182.65	250.22	317.52	434.34	718.63	1,516.57	1,556.79	1,700.11	1,715.23	1,792.70	1,826.73	1,021.80	1,038.13	1,175.98	1,240.75
Process Equipment	-	-	-	-	-	-	-	-	-	-	0.15	0.15	0.15	0.15	0.15	0.08	0.08	0.21	0.21
Total LM kWh$	163.14	810.78	4,081.20	9,551.12	10,717.55	12,590.66	14,780.00	17,368.51	19,930.43	23,183.67	25,050.00	26,582.01	28,820.72	33,634.97	36,268.81	21,486.13	24,076.52	26,646.15	31,443.50
kW	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10
Custom	-	-	-	-	4.41	4.41	4.41	4.41	89.55	135.90	188.01	190.97	190.97	649.96	722.57	722.57	1,085.62	1,313.89	1,945.55
Energy Star Food Service Products	-	1.10	1.86	7.70	16.55	33.36	44.41	51.68	88.08	92.15	92.92	102.70	128.40	129.26	137.93	144.10	145.20	148.28	153.97
HVAC	0.24	5.98	6.16	10.61	49.06	76.25	96.40	129.26	135.58	173.93	189.75	276.20	313.18	314.41	355.89	505.52	529.68	596.47	637.04
Lighting	53.70	253.56	1,283.56	2,473.24	2,726.04	3,173.78	3,711.94	4,517.00	4,922.95	5,445.75	5,849.57	6,178.39	6,745.24	7,060.34	7,545.00	7,921.35	8,356.81	8,808.44	9,672.82
Motors/Pumps/VFD	-	-	-	34.43	34.43	47.16	59.81	88.59	144.33	301.52	309.55	337.97	341.16	356.34	363.71	364.17	370.99	419.47	442.82
Process Equipment	-	-	-	-	-	-	-	-	-	-	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.08	0.08
Total kW	53.94	260.64	1,291.58	2,525.99	2,830.50	3,334.96	3,916.97	4,790.94	5,380.50	6,149.26	6,629.83	7,086.27	7,718.97	8,510.34	9,125.13	9,657.74	10,488.32	11,286.63	12,852.28
LM Rate ($ per kw month)	**8.04733**	**8.04733**	**8.04733**	**8.04733**	**8.04733**	**8.04733**	**8.04733**	**9.44843**	**9.44843**	**9.44843**	**9.44843**	**9.44843**	**9.44843**	**9.44843**	**9.44843**	**9.44843**	**9.44843**	**9.44843**	**9.44843**
LM kW$	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10
Custom	-	-	-	-	35.47	35.47	35.47	41.65	846.09	1,284.07	1,776.37	1,804.33	1,804.33	6,141.13	6,827.13	6,827.13	10,257.36	12,414.22	18,382.40
Energy Star Food Service Products	-	8.87	14.98	62.00	133.22	268.45	357.41	488.29	832.23	870.70	877.95	970.38	1,213.16	1,221.28	1,303.19	1,361.48	1,371.89	1,400.98	1,454.79
HVAC	1.91	48.12	49.56	85.39	394.84	613.64	775.74	1,221.30	1,281.03	1,643.40	1,792.88	2,609.69	2,959.02	2,970.66	3,362.65	4,776.37	5,004.60	5,635.74	6,019.04
Lighting	432.18	2,040.44	10,329.19	19,903.00	21,937.36	25,540.45	29,871.21	42,678.60	46,514.20	51,453.79	55,269.26	58,376.13	63,731.90	66,709.12	71,288.41	74,844.33	78,958.76	83,225.90	91,393.00
Motors/Pumps/VFD	-	-	-	277.05	277.05	379.49	481.30	837.02	1,363.71	2,848.87	2,924.79	3,193.26	3,223.41	3,366.86	3,436.51	3,440.88	3,505.31	3,963.35	4,183.95
Process Equipment	-	-	-	-	-	-	-	-	-	-	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.74	0.74
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Total LM kW$	434.08	2,097.42	10,393.73	20,327.45	22,777.94	26,837.50	31,521.13	45,266.85	50,837.26	58,100.82	62,641.53	66,954.09	72,932.12	80,409.35	86,218.18	91,250.47	99,098.22	106,640.92	121,433.92
Total LMs																			
Custom	-	-	-	-	52.35	52.35	52.35	57.84	1,416.25	2,254.70	3,047.35	3,085.20	3,085.20	11,033.42	12,301.56	9,886.72	14,925.46	18,120.72	26,551.12
Energy Star Food Service Products	-	16.67	26.18	108.93	233.80	456.74	610.57	773.61	1,322.06	1,383.68	1,395.55	1,549.87	1,897.67	1,909.13	2,028.13	1,787.54	1,802.88	1,842.42	1,913.58
HVAC	2.98	75.14	77.39	141.85	656.59	1,020.48	1,289.91	1,882.59	1,974.64	2,533.46	2,763.95	3,722.88	4,261.36	4,279.30	4,883.74	6,054.72	6,352.08	7,174.45	7,673.85
Lighting	594.24	2,816.40	14,371.35	29,168.09	32,093.05	37,268.88	43,549.47	58,649.96	63,972.40	70,747.21	76,002.66	80,284.35	87,569.52	91,662.47	98,009.87	90,544.56	95,550.50	101,009.22	111,313.22
Motors/Pumps/VFD	-	-	-	459.70	459.70	629.71	798.82	1,271.36	2,082.35	4,365.43	4,481.58	4,893.37	4,938.64	5,159.55	5,263.24	4,462.68	4,543.44	5,139.32	5,424.70
Process Equipment	-	-	-	-	-	-	-	-	-	-	0.44	0.44	0.44	0.44	0.44	0.38	0.38	0.94	0.94
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Total LM kW$	597.22	2,908.20	14,474.93	29,878.57	33,495.49	39,428.16	46,301.12	62,635.36	70,767.68	81,284.49	87,691.53	93,536.11	101,752.84	114,044.31	122,486.99	112,736.60	123,174.73	133,287.08	152,877.43

Duke Energy Carolinas
DSM/EE Vintage 1 True Up for the Period June 1, 2009 to December 31, 2010
Residential Conservation Financials

	Sum of NPV of Avoided Costs (Rev Comp)	Sharing Per Settlement	Carolinas System Revenue (North Carolina Inputs)
2009	**7,304,800.07**		**3,652,400.03**
Residential Energy Assessments			
NC_ Home Energy House Call	746,060.45	50.00%	373,030.22
Energy Efficiency Education Program for Schools			
NC_ K-12 Education Program- CFL Distribution	98,917.74	50.00%	49,458.87
NC_ K-12 Education Program- Curriculum	139,035.77	50.00%	69,517.88
Low Income Energy Efficiency and Weatherization Assistance			
NC_ Agency Assistance Portal	365,390.01	50.00%	182,695.01
Residential Energy Assessments			
NC_ Online Audit	593,794.82	50.00%	296,897.41
Residential Energy Assessments			
NC_ Personalized Energy Report	1,358,028.07	50.00%	679,014.04
Smart Saver® for Residential Customers			
NC_ Smart Saver - Residential Compact Fluorescent Light Promo	2,530,597.40	50.00%	1,265,298.70
Smart Saver® for Residential Customers			
NC_ Smart Saver - Central Air Conditioner	481,766.02	50.00%	240,883.01
Smart Saver® for Residential Customers			
NC_ Smart Saver - Heat Pump	991,209.79	50.00%	495,604.90
2010	**107,249,066.94**		**53,624,533.47**
Home Energy Comparison Report	171,653.58		
NC_ Home Energy Comparison Report - Pilot	171,653.58	50.00%	85,826.79
Residential Energy Assessments	1,780,228.10		
NC_ Home Energy House Call	1,780,228.10	50.00%	890,114.05
Energy Efficiency Education Program for Schools	1,979,072.48		
NC_ K-12 Education Program- CFL Distribution	822,704.31	50.00%	411,352.15
NC_ K-12 Education Program- Curriculum	1,156,368.18	50.00%	578,184.09
Low Income Energy Efficiency and Weatherization Assistance	1,527,312.95		
NC_ Agency Assistance Portal	1,527,312.95	50.00%	763,656.47
Residential Energy Assessments	336,046.34		
NC_ Online Audit	336,046.34	50.00%	168,023.17
Residential Energy Assessments	1,696,597.82		
NC_ Personalized Energy Report	1,696,597.82	50.00%	848,298.91
Smart Saver® for Residential Customers	92,986,651.09		
NC_ RCFL Opt-In Free CFLs	92,221,408.47	50.00%	46,110,704.24
NC_ Smart Saver - Residential Compact Fluorescent Light Promo	765,242.62	50.00%	382,621.31
Smart Saver® for Residential Customers	460,110.28		
NC_ Property Manager 13WCFL	460,110.28	50.00%	230,055.14
Smart Saver® for Residential Customers	1,962,526.20		
NC_ Smart Saver - Central Air Conditioner	1,962,526.20	50.00%	981,263.10
Smart Saver® for Residential Customers	4,348,868.11		
NC_ Smart Saver - Heat Pump	4,348,868.11	50.00%	2,174,434.05

Duke Energy Carolinas
DSM/EE Vintage 1 True Up for the Period June 1, 2009 to December 31, 2010
Non-Residential Conservation Financials

	Sum of NPV of Avoided Costs (Rev Comp)	Sharing Per Settlement	Carolinas System Revenue (North Carolina Inputs)	North Carolina Allocation	Calculated North Carolina Avoided Cost Revenue
2009	7,576,597.89		3,788,298.94		2,765,751.13
Smart Saver® for Non-Residential Customers - Energy Star Food Service Products					
NC_ Combination Oven (90 lbs_hr)	7,892.44	50.00%	3,946.22	73.01%	2,881.05
NC_ Convection Oven	1,939.35	50.00%	969.68	73.01%	707.94
NC_ Griddles	5,747.67	50.00%	2,873.84	73.01%	2,098.12
NC_ Holding Cabinet Full Size Insulated	7,355.05	50.00%	3,677.53	73.01%	2,684.88
NC_ Icemaker (100 to 500 lbs_day)	1,838.26	50.00%	919.13	73.01%	671.04
NC_ Icemaker (Greater Than 1000 lbs_day)	15,699.29	50.00%	7,849.64	73.01%	5,730.85
NC_ Night covers for displays	140.36	50.00%	70.18	73.01%	51.24
NC_ Solid Door Reach-in Freezer (21 to 48 cu ft) Avg 30	215.70	50.00%	107.85	73.01%	78.74
NC_ Solid Door Reach-in Freezer (Less Than 20 cu ft) avg 12	441.65	50.00%	220.82	73.01%	161.22
NC_ Solid Door Reach-in Refrig (Greater Than 48cu ft) Avg 63	578.30	50.00%	289.15	73.01%	211.10
NC_ Solid Door Reach-in Refrig (Less Than 20 cu ft) Avg 12	1,538.05	50.00%	769.03	73.01%	561.45
NC_ Steamer_3 pan	5,490.35	50.00%	2,745.17	73.01%	2,004.19
NC_ Steamer_5 pan	55,843.69	50.00%	27,921.84	73.01%	20,385.10
NC_ Steamer_6 pan	48,658.02	50.00%	24,329.01	73.01%	17,762.06
Smart Saver® for Non-Residential Customers - HVAC					
NC_ AC 135,000 - 240,000	88,079.34	50.00%	44,039.67	73.01%	32,152.37
NC_ AC 240,000 - 760,000	10,497.02	50.00%	5,248.51	73.01%	3,831.82
NC_ AC 65,000 - 135,000	11,858.56	50.00%	5,929.28	73.01%	4,328.83
NC_ AC greater than 760,000	5,034.77	50.00%	2,517.38	73.01%	1,837.89
NC_ AC less than 65,000 1 Ph	274.25	50.00%	137.12	73.01%	100.11
NC_ Air-Cooled Recip Chiller COP = 3!08, IPLV = 3!36	52,130.88	50.00%	26,065.44	73.01%	19,029.79
NC_ Air-Cooled Screw Chiller COP = 3!08, IPLV = 3!36	148,172.07	50.00%	74,086.03	73.01%	54,088.53
NC_ Air-Cooled Screw Chiller COP = 3!08, IPLV = 4!00	54,805.60	50.00%	27,402.80	73.01%	20,006.16
NC_ Energy Star Window AC over 14,000 Btu hr	616.96	50.00%	308.48	73.01%	225.21
NC_ Energy Star Window AC under 14,000 Btu hr	424.40	50.00%	212.20	73.01%	154.92
NC_ HP less than 65,000 1 Ph	292.57	50.00%	146.29	73.01%	106.80
NC_ Packaged Terminal AC	10,058.73	50.00%	5,029.36	73.01%	3,671.82
NC_ Setback Programmable Thermostat	57,783.31	50.00%	28,891.66	73.01%	21,093.14
NC_ Water-Cooled cent Chiller greater than 300 ton 0!58 kW_ton with 0!41 kW_ton IPLV	98,359.06	50.00%	49,179.53	73.01%	35,904.86
NC_ Water-cooled screw chiller 150 - 300 ton 0!65 kW_ton with 0!51 kW_ton IPLV	32,965.12	50.00%	16,482.56	73.01%	12,033.54
NC_ Window Film	11,786.78	50.00%	5,893.39	73.01%	4,302.63
Smart Saver® for Non-Residential Customers Lighting					
NC_ 2 High Bay 6L T-5 High Output replacing 1000W HID	43,423.74	50.00%	21,711.87	73.01%	15,851.34
NC_ Compact Fluorescent Fixture	55,173.32	50.00%	27,586.66	73.01%	20,140.40
NC_ Compact Fluorescent Screw in	546,896.82	50.00%	273,448.41	73.01%	199,638.48
NC_ High Bay 4L T-5 High Output	250,005.99	50.00%	125,003.00	73.01%	91,261.85
NC_ High Bay 6L T-5 High Output	314,862.78	50.00%	157,431.39	73.01%	114,937.09
NC_ High Bay 8L T-5 High Output	2,180.40	50.00%	1,090.20	73.01%	795.93
NC_ High Bay Fluorescent 4 Lamp (F32 Watt T8)	147,469.46	50.00%	73,734.73	73.01%	53,832.05
NC_ High Bay Fluorescent 6 Lamp (F32 Watt T8)	3,537,966.52	50.00%	1,768,983.26	73.01%	1,291,494.55
NC_ High Bay Fluorescent 8 Lamp (F32 Watt T8)	94,126.58	50.00%	47,063.29	73.01%	34,359.84
NC_ High Performance Low Watt T8 4ft 1 lamp, replacing standard T8	325.67	50.00%	162.84	73.01%	118.88
NC_ High Performance Low Watt T8 4ft 2 lamp, replacing standard T8	18,990.94	50.00%	9,495.47	73.01%	6,932.43
NC_ High Performance Low Watt T8 4ft 3 lamp, replacing standard T8	28,129.27	50.00%	14,064.63	73.01%	10,268.27
NC_ High Performance Low Watt T8 4ft 4 lamp, replacing standard T8	23,295.89	50.00%	11,647.94	73.01%	8,503.90
NC_ High Performance T-8 4ft 2 lamp replacing T-12 High Output 8ft 1 lamp	27,239.30	50.00%	13,619.65	73.01%	9,943.40
NC_ High Performance T8 4ft 2 lamp, replacing standard T8	482.58	50.00%	241.29	73.01%	176.16
NC_ High Performance T8 4ft 3 lamp, replacing standard T8	21,387.31	50.00%	10,693.66	73.01%	7,807.20
NC_ High Performance T-8 4ft 4 lamp replacing T-12 High Output 8ft 2 lamp	35,770.63	50.00%	17,885.31	73.01%	13,057.66
NC_ High Performance T8 4ft 4 lamp, replacing T12-HPT8	5,182.52	50.00%	2,591.26	73.01%	1,891.82
NC_ LED Exit Signs Electronic Fixtures (Retrofit Only)	26,060.76	50.00%	13,030.38	73.01%	9,513.19
NC_ Low Watt T8 lamps replacing standard 32 Watt T-8's	76,554.50	50.00%	38,277.25	73.01%	27,945.35
NC_ Occupancy Sensors over 500 Watts	73,661.19	50.00%	36,830.59	73.01%	26,889.18
NC_ Occupancy Sensors under 500 Watts	374,034.26	50.00%	187,017.13	73.01%	136,536.97
NC_ T-5 4 Lamp with Electronic Ballast (replacing T-12 fixture)	645.92	50.00%	322.96	73.01%	235.79
NC_ T-5 High Output 3 Lamp with Electronic Ballast (replacing T-12 fixture)	2,556.61	50.00%	1,278.30	73.01%	933.26
NC_ T-5 High Output 4 Lamp with Electronic Ballast (replacing T-12 fixture)	9,085.21	50.00%	4,542.60	73.01%	3,316.45
NC_ T-8 2ft 1 lamp	119.99	50.00%	59.99	73.01%	43.80
NC_ T-8 2ft 2 lamp	3,798.18	50.00%	1,899.09	73.01%	1,386.48
NC_ T-8 2ft 3 lamp	202.43	50.00%	101.22	73.01%	73.90
NC_ T-8 3ft 1 lamp	2,484.02	50.00%	1,242.01	73.01%	906.76
NC_ T-8 3ft 2 lamp	217.37	50.00%	108.68	73.01%	79.35
NC_ T-8 3ft 4 lamp	89.97	50.00%	44.99	73.01%	32.84
NC_ T-8 4ft 1 lamp	5,202.47	50.00%	2,601.24	73.01%	1,899.10
NC_ T-8 4ft 2 lamp	156,118.87	50.00%	78,059.44	73.01%	56,989.42
NC_ T-8 4ft 3 lamp	45,106.82	50.00%	22,553.41	73.01%	16,465.73
NC_ T-8 4ft 4 lamp	296,700.47	50.00%	148,350.24	73.01%	108,307.14
NC_ T-8 8ft 1 lamp	639.82	50.00%	319.91	73.01%	233.56
NC_ T-8 8ft 2 lamp	43,905.42	50.00%	21,952.71	73.01%	16,027.18
NC_ T-8 High Output 8 ft 2 Lamp	57,102.48	50.00%	28,551.24	73.01%	20,844.61
Smart Saver® for Non-Residential Customers Motors					
NC_ 25-100 Horse Power Motors - Incentives per participant	2,565.06	50.00%	1,282.53	73.01%	936.35
NC_ 3 Horse Power High Efficiency Pumps	686.75	50.00%	343.37	73.01%	250.69
NC_ 7!5-20 Horse Power Motors - Incentives per participant	198.20	50.00%	99.10	73.01%	72.35
NC_ Variable Frequency Drive 10 Horse Power Pumps	88,649.64	50.00%	44,324.82	73.01%	32,360.55
NC_ Variable Frequency Drive 15 Horse Power Pumps	79,784.68	50.00%	39,892.34	73.01%	29,124.49
NC_ Variable Frequency Drive 20 Horse Power Pumps	35,459.86	50.00%	17,729.93	73.01%	12,944.22
NC_ Variable Frequency Drive 25 Horse Power Pumps	66,487.23	50.00%	33,243.62	73.01%	24,270.41
NC_ Variable Frequency Drive 30 Horse Power - Process Pumping	14,547.67	50.00%	7,273.83	73.01%	5,310.46
NC_ Variable Frequency Drive 40 Horse Power - Process Pumping	38,793.77	50.00%	19,396.89	73.01%	14,161.23
NC_ Variable Frequency Drive 5 Horse Power Pumps	8,864.96	50.00%	4,432.48	73.01%	3,236.05
NC_ Variable Frequency Drive 50 Horse Power Pumps	88,649.64	50.00%	44,324.82	73.01%	32,360.55
NC_ Variable Frequency Drive 7!5 Horse Power Pumps	26,594.89	50.00%	13,297.45	73.01%	9,708.16
Smart Saver® for Non-Residential Customers - Custom Rebate					
NC_ SAW CustomNC - Bank of America EMS - Gas Heat	5,493.56	50.00%	2,746.78	73.01%	2,005.36
NC_ SAW CustomSC - Bank of America - EMS - Electric Heat	50,614.33	50.00%	25,307.17	73.01%	18,476.19
NC_ SAW CustomSC - Bank of America - EMS - Gas Heat	5,493.56	50.00%	2,746.78	73.01%	2,005.36
2010	33,028,809.11		16,514,404.56		12,007,173.22
Smart Saver® for Non-Residential Customers - Energy Star Food Service Products					
NC_ Anti-sweat Heater Controls	48,739.06	50.00%	24,369.53	72.71%	17,718.42
NC_ Combination Oven (90 lbs_hr)	86,816.87	50.00%	43,408.44	72.71%	31,561.09
NC_ Convection Oven	27,150.94	50.00%	13,575.47	72.71%	9,870.36
NC_ ENERGY STAR Commercial Solid Door Refrigerators less than 15ft3 - var	114.90	50.00%	57.45	72.71%	41.77
NC_ ENERGY STAR Commercial Solid Door Refrigerators more than 50ft3 - var	481.43	50.00%	240.71	72.71%	175.02
NC_ Fryer	6,063.08	50.00%	3,031.54	72.71%	2,204.15
NC_ Holding Cabinet Full Size Insulated	105,422.42	50.00%	52,711.21	72.71%	38,324.88
NC_ Holding Cabinet Half Size Insulated	830.27	50.00%	415.14	72.71%	301.83
NC_ Icemaker (100 to 500 lbs_day)	8,578.56	50.00%	4,289.28	72.71%	3,118.62
NC_ Icemaker (500 to 1000 lbs_day)	5,996.69	50.00%	2,998.35	72.71%	2,180.02
NC_ Icemaker (Greater Than 1000 lbs_day)	31,398.57	50.00%	15,699.29	72.71%	11,414.52
NC_ Night covers for displays	6,994.71	50.00%	3,497.36	72.71%	2,542.83
NC_ Solid Door Reach-in Freezer (Less Than 20 cu ft) avg 12	441.65	50.00%	220.82	72.71%	160.55
NC_ Solid Door Reach-in Refrig (21 to 48 cu ft) Avg 30	11,359.09	50.00%	5,679.55	72.71%	4,129.44
NC_ Solid Door Reach-in Refrig (Greater Than 48cu ft) Avg 63	578.30	50.00%	289.15	72.71%	210.23
NC_ Solid Door Reach-in Refrig (Less Than 20 cu ft) Avg 12	2,691.60	50.00%	1,345.80	72.71%	978.49
NC_ Steamer_3 pan	21,961.38	50.00%	10,980.69	72.71%	7,983.76
NC_ Steamer_5 pan	12,409.71	50.00%	6,204.85	72.71%	4,511.38
NC_ Steamer_6 pan	34,755.73	50.00%	17,377.87	72.71%	12,634.97
NC_ Vending Equipment Controller	22,669.21	50.00%	11,334.61	72.71%	8,241.08

Smart Saver® for Non-Residential Customers - HVAC					
NC_ Chilled Air EE Cooled Chillers	228,763.05	50.00%	114,381.53	72.71%	83,163.69
Smart Saver® for Non-Residential Customers - HVAC					
NC_ AC 135,000 - 240,000	150,135.25	50.00%	75,067.62	72.71%	54,579.62
NC_ AC 240,000 - 760,000	47,236.58	50.00%	23,618.29	72.71%	17,172.22
NC_ AC 65,000 - 135,000	67,763.21	50.00%	33,881.60	72.71%	24,634.39
NC_ AC greater than 760,000	20,139.08	50.00%	10,069.54	72.71%	7,321.29
NC_ AC less than 65,000 1 Ph	3,290.96	50.00%	1,645.48	72.71%	1,196.38
NC_ AC less than 65,000 3 Ph	4,311.88	50.00%	2,155.94	72.71%	1,567.53
NC_ Air-Cooled Screw Chiller COP = 2.86, IPLV = 3.48	27,181.87	50.00%	13,590.94	72.71%	9,881.60
NC_ Air-Cooled Screw Chiller COP = 2.86, IPLV = 3.97	221,748.85	50.00%	110,874.43	72.71%	80,613.77
NC_ Air-Cooled Screw Chiller COP = 2.86, IPLV = 4.33	315,667.70	50.00%	157,833.85	72.71%	114,756.69
NC_ Air-Cooled Screw Chiller COP = 3!08, IPLV = 4!00	767,278.35	50.00%	383,639.18	72.71%	278,933.58
NC_ HP 135,000 - 240,000	2,869.44	50.00%	1,434.72	72.71%	1,043.15
NC_ HP 65,000 - 135,000	13,495.35	50.00%	6,747.68	72.71%	4,906.05
NC_ HP less than 65,000 1 Ph	5,558.89	50.00%	2,779.44	72.71%	2,020.86
NC_ HP less than 65,000 3 Ph	186.95	50.00%	93.47	72.71%	67.96
NC_ Packaged Terminal AC	5,011.53	50.00%	2,505.76	72.71%	1,821.87
NC_ Setback Programmable Thermostat	171,337.58	50.00%	85,668.79	72.71%	62,287.44
NC_ Thermal Storage	123,146.13	50.00%	61,573.06	72.71%	44,768.10
NC_ Water-Cooled cent Chiller 150 - 300 ton 0!63 kW_ton with 0!38 kW_ton IPLV	34,141.92	50.00%	17,070.96	72.71%	12,411.83
NC_ Water-Cooled cent Chiller 150 - 300 ton 0!63 kW_ton with 0!45 kW_ton IPLV	71,930.87	50.00%	35,965.44	72.71%	26,149.49
NC_ Water-Cooled cent Chiller greater than 300 ton 0!52 kW_ton with 0!39 kW_ton IPLV	297,584.17	50.00%	148,792.08	72.71%	108,182.67
NC_ Water-Cooled cent Chiller greater than 300 ton 0!52 kW_ton with 0!49 kW_ton IPLV	157,601.81	50.00%	78,800.91	72.71%	57,293.99
NC_ Water-Cooled cent Chiller greater than 300 ton 0!58 kW_ton with 0!35 kW_ton IPLV	553,336.37	50.00%	276,668.18	72.71%	201,157.89
NC_ Water-Cooled cent Chiller greater than 300 ton 0!58 kW_ton with 0!41 kW_ton IPLV	98,359.06	50.00%	49,179.53	72.71%	35,757.09
NC_ Water-cooled screw chiller 150 - 300 ton 0!57 kW_ton with 0!4 kW_ton IPLV	61,295.72	50.00%	30,647.86	72.71%	22,283.22
NC_ Water-cooled screw chiller 150 - 300 ton 0!65 kW_ton with 0!57 kW_ton IPLV	20,831.83	50.00%	10,415.92	72.71%	7,573.13
NC_ Water-cooled screw chiller 150 - 300 ton 0!72 kW_ton with 0!54 kW_ton IPLV	18,114.19	50.00%	9,057.10	72.71%	6,585.17
NC_ Water-cooled screw chiller greater than 300 ton 0!58 kW_ton with 0!51 kW_ton IPLV	161,605.84	50.00%	80,802.92	72.71%	58,749.60
NC_ Water-cooled screw chiller less than 150 ton 0!71 kW_ton with 0!56 kW_ton IPLV	25,260.80	50.00%	12,630.40	72.71%	9,183.22
NC_ Water-cooled screw chiller less than 150 ton 0!79 kW_ton with 0!55 kW_ton IPLV	9,387.76	50.00%	4,693.88	72.71%	3,412.79
NC_ Window Film	24,850.11	50.00%	12,425.06	72.71%	9,033.92
Smart Saver® for Non-Residential Customers Lighting					
NC_ 2 High Bay 6L T-5 High Output replacing 1000W HID	94,446.63	50.00%	47,223.31	72.71%	34,334.78
NC_ CFL12PKMXBC_22_SC	625,259.31	50.00%	312,629.66	72.71%	227,304.50
NC_ Compact Fluorescent Fixture	438,122.82	50.00%	219,061.41	72.71%	159,273.58
NC_ Compact Fluorescent Screw in	374,052.19	50.00%	187,026.10	72.71%	135,981.57
NC_ High Bay 2L T-5 High Output	17,257.54	50.00%	8,628.77	72.71%	6,273.74
NC_ High Bay 3L T-5 High Output	9,840.34	50.00%	4,920.17	72.71%	3,577.32
NC_ High Bay 4L T-5 High Output	2,393,571.16	50.00%	1,196,785.58	72.71%	870,150.16
NC_ High Bay 6L T-5 High Output	834,235.59	50.00%	417,117.79	72.71%	303,274.97
NC_ High Bay 8L T-5 High Output	346,683.17	50.00%	173,341.58	72.71%	126,031.94
NC_ High Bay Fluorescent 3 Lamp (F32 Watt T8)	16,444.84	50.00%	8,222.42	72.71%	5,978.30
NC_ High Bay Fluorescent 4 Lamp (F32 Watt T8)	1,179,755.66	50.00%	589,877.83	72.71%	428,884.09
NC_ High Bay Fluorescent 6 Lamp (F32 Watt T8)	3,529,937.42	50.00%	1,764,968.71	72.71%	1,283,260.62
NC_ High Bay Fluorescent 8 Lamp (F32 Watt T8)	166,561.43	50.00%	83,280.72	72.71%	60,551.14
NC_ High Performance Low Watt T8 4ft 1 lamp, replacing standard T8	498.09	50.00%	249.04	72.71%	181.07
NC_ High Performance Low Watt T8 4ft 2 lamp, replacing standard T8	19,214.74	50.00%	9,607.37	72.71%	6,985.26
NC_ High Performance Low Watt T8 4ft 3 lamp, replacing standard T8	39,867.11	50.00%	19,933.55	72.71%	14,493.14
NC_ High Performance Low Watt T8 4ft 4 lamp, replacing standard T8	39,359.90	50.00%	19,679.95	72.71%	14,308.75
NC_ High Performance T8 4ft 1 lamp, replacing standard T8	1,204.53	50.00%	602.26	72.71%	437.89
NC_ High Performance T8 4ft 1 lamp, replacing T12-HPT8	21,793.58	50.00%	10,896.79	72.71%	7,922.76
NC_ High Performance T-8 4ft 2 lamp replacing T-12 8ft 1 lamp	28,550.68	50.00%	14,275.34	72.71%	10,379.21
NC_ High Performance T-8 4ft 2 lamp replacing T-12 High Output 8ft 1 lamp	32,803.07	50.00%	16,401.53	72.71%	11,925.11
NC_ High Performance T8 4ft 2 lamp, replacing standard T8	14,507.61	50.00%	7,253.81	72.71%	5,274.05
NC_ High Performance T8 4ft 2 lamp, replacing T12-HPT8	149,209.06	50.00%	74,604.53	72.71%	54,242.92
NC_ High Performance T8 4ft 3 lamp, replacing standard T8	1,345.11	50.00%	672.56	72.71%	489.00
NC_ High Performance T8 4ft 3 lamp, replacing T12-HPT8	33,747.22	50.00%	16,873.61	72.71%	12,268.34
NC_ High Performance T-8 4ft 4 lamp replacing T-12 8ft 2 lamp	18,063.09	50.00%	9,031.54	72.71%	6,566.59
NC_ High Performance T-8 4ft 4 lamp replacing T-12 High Output 8ft 2 lamp	74,757.68	50.00%	37,378.84	72.71%	27,177.14
NC_ High Performance T8 4ft 4 lamp, replacing standard T8	10,773.72	50.00%	5,386.86	72.71%	3,916.64
NC_ High Performance T8 4ft 4 lamp, replacing T12-HPT8	113,057.75	50.00%	56,528.87	72.71%	41,100.60
NC_ LED Case lighting	1,984,044.68	50.00%	992,022.34	72.71%	721,272.39
NC_ LED Case lighting with sensor control	103,350.04	50.00%	51,675.02	72.71%	37,571.50
NC_ LED Exit Signs Electronic Fixtures (Retrofit Only)	51,909.22	50.00%	25,954.61	72.71%	18,870.89
NC_ Low Watt T8 lamps replacing standard 32 Watt T-8's	247,888.14	50.00%	123,944.07	72.71%	90,116.35
NC_ Occupancy Sensors over 500 Watts	1,145,965.62	50.00%	572,982.81	72.71%	416,600.17
NC_ Occupancy Sensors under 500 Watts	3,185,213.82	50.00%	1,592,606.91	72.71%	1,157,941.05
NC_ Pulse Start Metal Halide (retrofit only)	190.09	50.00%	95.05	72.71%	69.10
NC_ T-5 1 Lamp with Electronic Ballast (replacing T-12 fixture)	723.49	50.00%	361.75	72.71%	263.01
NC_ T-5 2 Lamp with Electronic Ballast (replacing T-12 fixture)	6,320.30	50.00%	3,160.15	72.71%	2,297.66
NC_ T-5 3 Lamp with Electronic Ballast (replacing T-12 fixture)	3,490.36	50.00%	1,745.18	72.71%	1,268.87
NC_ T-5 4 Lamp with Electronic Ballast (replacing T-12 fixture)	12,407.09	50.00%	6,203.54	72.71%	4,510.43
NC_ T-5 High Output 2 Lamp with Electronic Ballast (replacing T-12 fixture)	27,461.31	50.00%	13,730.65	72.71%	9,983.18
NC_ T-5 High Output 3 Lamp with Electronic Ballast (replacing T-12 fixture)	2,016.88	50.00%	1,008.44	72.71%	733.21
NC_ T-5 High Output 4 Lamp with Electronic Ballast (replacing T-12 fixture)	18,685.89	50.00%	9,342.95	72.71%	6,793.00
NC_ T-8 2ft 1 lamp	692.24	50.00%	346.12	72.71%	251.65
NC_ T-8 2ft 2 lamp	22,400.13	50.00%	11,200.06	72.71%	8,143.26
NC_ T-8 2ft 3 lamp	1,754.42	50.00%	877.21	72.71%	637.79
NC_ T-8 2ft 4 lamp	4,915.89	50.00%	2,457.95	72.71%	1,787.11
NC_ T-8 3ft 1 lamp	890.73	50.00%	445.37	72.71%	323.81
NC_ T-8 3ft 2 lamp	2,425.35	50.00%	1,212.67	72.71%	881.70
NC_ T-8 3ft 4 lamp	1,889.37	50.00%	944.69	72.71%	686.86
NC_ T-8 4ft 1 lamp	59,114.69	50.00%	29,557.35	72.71%	21,490.34
NC_ T-8 4ft 2 lamp	866,142.35	50.00%	433,071.18	72.71%	314,874.24
NC_ T-8 4ft 3 lamp	416,840.55	50.00%	208,420.27	72.71%	151,536.70
NC_ T-8 4ft 4 lamp	907,323.35	50.00%	453,661.67	72.71%	329,845.03
NC_ T-8 8ft 1 lamp	1,869.28	50.00%	934.64	72.71%	679.55
NC_ T-8 8ft 2 lamp	87,271.03	50.00%	43,635.51	72.71%	31,726.19
NC_ T-8 High Output 8 ft 2 Lamp	149,414.40	50.00%	74,707.20	72.71%	54,317.57
Smart Saver® for Non-Residential Customers Motors					
NC_ 10 Horse Power High Efficiency Pumps	6,866.27	50.00%	3,433.14	72.71%	2,496.14
NC_ 125-250 Horse Power Motors - Incentives per participant	3,539.79	50.00%	1,769.89	72.71%	1,286.84
NC_ 1-5 Horse Power Motors - Incentives per participant	273.93	50.00%	136.97	72.71%	99.58
NC_ 20 Horse Power High Efficiency Pumps	11,440.72	50.00%	5,720.36	72.71%	4,159.12
NC_ 25-100 Horse Power Motors - Incentives per participant	17,955.41	50.00%	8,977.71	72.71%	6,527.44
NC_ 3 Horse Power High Efficiency Pumps	343.37	50.00%	171.69	72.71%	124.83
NC_ 5 Horse Power High Efficiency Pumps	2,287.53	50.00%	1,143.77	72.71%	831.60
NC_ 7!5 Horse Power High Efficiency Pumps	2,574.39	50.00%	1,287.20	72.71%	935.89
NC_ 7!5-20 Horse Power Motors - Incentives per participant	2,576.58	50.00%	1,288.29	72.71%	936.68
NC_ Variable Frequency Drive 1!5 Horse Power Pumps	2,659.49	50.00%	1,329.74	72.71%	966.82
NC_ Variable Frequency Drive 10 Horse Power Pumps	195,029.21	50.00%	97,514.61	72.71%	70,900.21
NC_ Variable Frequency Drive 15 Horse Power Pumps	53,189.79	50.00%	26,594.89	72.71%	19,336.42
NC_ Variable Frequency Drive 2 Horse Power Pumps	1,772.99	50.00%	886.50	72.71%	644.55
NC_ Variable Frequency Drive 20 Horse Power - Process Pumping	48,492.22	50.00%	24,246.11	72.71%	17,628.68
NC_ Variable Frequency Drive 20 Horse Power Pumps	124,109.50	50.00%	62,054.75	72.71%	45,118.32
NC_ Variable Frequency Drive 25 Horse Power - Process Pumping	36,369.16	50.00%	18,184.58	72.71%	13,221.51
NC_ Variable Frequency Drive 25 Horse Power Pumps	310,273.75	50.00%	155,136.87	72.71%	112,795.79
NC_ Variable Frequency Drive 3 Horse Power Pumps	18,616.42	50.00%	9,308.21	72.71%	6,767.75
NC_ Variable Frequency Drive 30 Horse Power Pumps	265,948.93	50.00%	132,974.46	72.71%	96,682.11
NC_ Variable Frequency Drive 40 Horse Power Pumps	319,138.71	50.00%	159,569.36	72.71%	116,018.53
NC_ Variable Frequency Drive 5 Horse Power - Process Pumping	9,598.19	50.00%	4,799.10	72.71%	3,489.29
NC_ Variable Frequency Drive 5 Horse Power Pumps	93,082.12	50.00%	46,541.06	72.71%	33,838.74
NC_ Variable Frequency Drive 50 Horse Power - Process Pumping	24,246.11	50.00%	12,123.05	72.71%	8,814.34
NC_ Variable Frequency Drive 50 Horse Power Pumps	354,598.57	50.00%	177,299.28	72.71%	128,909.47
NC_ Variable Frequency Drive 7!5 Horse Power Pumps	53,189.79	50.00%	26,594.89	72.71%	19,336.42
Smart Saver® for Non-Residential Customers - Other Prescriptive					
NC_ Barrel Wraps (Inj Mold & Extruders)	99.61	50.00%	49.80	72.71%	36.21
Smart Saver® for Non-Residential Customers - Custom Rebate					
NC_ SAW CustomNC - Lowes 291 T-5 4 Lamp fixtures	197,804.21	50.00%	98,902.10	72.71%	71,909.02
NC_ SAW CustomNC - Lowes 356 T-5 5 Lamp fixtures	138,804.41	50.00%	69,402.21	72.71%	50,460.45

NC_ SAW CustomNC - Lowes 54 T-5 4 Lamp fixtures	12,308.44	50.00%	6,154.22	72.71%	[illegible]
NC_ SAW - CustomNC Center for International Ed	3,612.72	50.00%	1,806.36	72.71%	1,313.36
NC_ SAW CustomNC - American Efird VFD on 60 HP fan(4)	15,969.70	50.00%	7,984.85	72.71%	[illegible]
NC_ SAW CustomNC - American Efird VFD on 75 HP fan(1)	4,405.80	50.00%	2,202.90	72.71%	1,601.67
NC_ SAW CustomNC - Baker Sports HVAC Optimization 0%FR	338,171.51	50.00%	169,085.76	72.71%	122,937.64
NC_ SAW CustomNC - Baker Sports Lighting Optimization 0%FR	28,648.14	50.00%	14,324.07	72.71%	10,414.64
NC_ SAW CustomNC - Bank of America EMS - Electric Heat	38,377.55	50.00%	19,188.78	72.71%	13,951.64
NC_ SAW CustomNC - Bank of America EMS - Gas Heat	32,961.35	50.00%	16,480.68	72.71%	11,982.65
NC_ SAW CustomNC - BigLots EMS Setback (Avg)	229,916.43	50.00%	114,958.21	72.71%	83,582.98
NC_ SAW CustomNC - BiLo EMS Upgrade	335,006.95	50.00%	167,503.47	72.71%	121,787.21
NC_ SAW CustomNC - Burlington (2) VFD on 200HP Pump	292,487.43	50.00%	146,243.71	72.71%	106,329.82
NC_ SAW CustomNC - Carnegie Bldg Pumps & Fans	15,513.81	50.00%	7,756.90	72.71%	5,639.83
NC_ SAW CustomNC - Carnegie Bldg_System Control	95,958.00	50.00%	47,979.00	72.71%	34,884.22
NC_ SAW CustomNC - Cato 2L 4ft T8 replacing HPS (225)	33,394.23	50.00%	16,697.11	72.71%	12,140.02
NC_ SAW CustomNC - Central Transport Dock Lighting	158,467.63	50.00%	79,233.82	72.71%	57,608.75
NC_ SAW CustomNC - Central Transport High Speed Chargers	43,822.24	50.00%	21,911.12	72.71%	15,930.98
NC_ SAW CustomNC - Central Transport Office Lighting	8,827.98	50.00%	4,413.99	72.71%	3,209.29
NC_ SAW CustomNC - CPCC NewPkgDeck_InductionLamp	137,793.42	50.00%	68,896.71	72.71%	50,092.92
NC_ SAW CustomNC - CPCC PkgDeck_MH replcd by (510)InductionFixtures	207,704.24	50.00%	103,852.12	72.71%	75,508.05
NC_ SAW CustomNC - Elon U MH rplc w_postLED	11,958.06	50.00%	5,979.03	72.71%	4,347.19
NC_ SAW CustomNC - Family Dollar EMS	19,175.25	50.00%	9,587.63	72.71%	6,970.90
NC_ SAW CustomNC - GSB LED PkgGrg Fxtr NLED2B rplc HPS 150W	103,519.82	50.00%	51,759.91	72.71%	37,633.22
NC_ SAW CustomNC - GSB LED PkgGrg Fxtr NLED2B rplc MH 175W	92,810.69	50.00%	46,405.35	72.71%	33,740.06
NC_ SAW CustomNC - Harris Teeter ECM Refrigerated Case	397,181.09	50.00%	198,590.54	72.71%	144,389.77
NC_ SAW CustomNC - Harris Teeter ECM Refrigerated Cooler	106,614.78	50.00%	53,307.39	72.71%	38,758.35
NC_ SAW CustomNC - HickorySprings Install T8s 2000 hrs	5,617.41	50.00%	2,808.70	72.71%	2,042.13
NC_ SAW CustomNC - HickorySprings Install T8s 4000 hrs	28,819.03	50.00%	14,409.52	72.71%	10,476.77
NC_ SAW CustomNC - HickorySprings Install T8s 5000 hrs	6,776.20	50.00%	3,388.10	72.71%	2,463.40
NC_ SAW CustomNC - HickorySprings Install T8s 6000 hrs	47,082.80	50.00%	23,541.40	72.71%	17,116.31
NC_ SAW CustomNC - Highwoods Properties - Chiller resize and upgrade	95,143.30	50.00%	47,571.65	72.71%	34,588.05
NC_ SAW CustomNC - IBM Chiller Optimization	1,659,894.11	50.00%	829,947.06	72.71%	603,431.87
NC_ SAW CustomNC - IBM TrianglePark ServerVirtualization	506,846.72	50.00%	253,423.36	72.71%	184,257.22
NC_ SAW CustomNC - JTL Duct_Insulation	18,180.99	50.00%	9,090.50	72.71%	6,609.45
NC_ SAW CustomNC - KMBA Replace 250w MH w 100W Ind	5,317.82	50.00%	2,658.91	72.71%	1,933.22
NC_ SAW CustomNC - KMBA Replace 400w MH w 150W Ind	4,543.53	50.00%	2,271.77	72.71%	1,651.74
NC_ SAW CustomNC - Knightstaff EC motors	76,069.42	50.00%	38,034.71	72.71%	27,654.00
NC_ SAW CustomNC - Lodgeworks Sierra Hotel HVAC	54,862.10	50.00%	27,431.05	72.71%	19,944.37
NC_ SAW CustomNC - Lowes Winston Salem MH to RAB WP2F84	2,634.45	50.00%	1,317.22	72.71%	957.72
NC_ SAW CustomNC - MM Fowler_MH replaced w Beta Canopy LED Light	7,513.84	50.00%	3,756.92	72.71%	2,731.55
NC_ SAW CustomNC - Professional Trailer Repair - remove T12s and install T5 6-lamp HO	8,014.31	50.00%	4,007.15	72.71%	2,913.49
NC_ SAW CustomNC - SanDanFarms Poultry House Fan Upgrade	9,249.70	50.00%	4,624.85	72.71%	3,362.60
NC_ SAW CustomNC - Shoe Carnival 4L repl w 2L T8	19,255.46	50.00%	9,627.73	72.71%	7,000.06
NC_ SAW CustomNC - Simmons Various Fixtures replaced with T8	266,319.93	50.00%	133,159.97	72.71%	96,816.98
NC_ SAW CustomNC - Ultimate Sports - Replace MH & T12 lighting w/T5	9,388.77	50.00%	4,694.38	72.71%	3,413.16
NC_ SAW CustomNC - WSOC Interview Set Lighting Retrofit wAC savings 1248 hrs_yr	2,270.95	50.00%	1,135.48	72.71%	825.57
NC_ SAW CustomNC - WSOC Studio Lighting Retrofit wAC savings 6552hrs_yr	66,117.24	50.00%	33,058.62	72.71%	24,036.02
NC_ SAW CustomNC - WSOC Traffic Desk Lighting Retrofit wAC savings 1040hrs_yr	2,188.89	50.00%	1,094.44	72.71%	795.74
NC_ SAW CustomSC - Bank of America - EMS - Electric Heat	22,495.26	50.00%	11,247.63	72.71%	8,177.84
NC_ SAW CustomSC - CBRE Reduced AC due to White Roof	36,704.43	50.00%	18,352.22	72.71%	13,343.40
NC_ SAW CustomSC - InmanMills 570HP AirCompressor	150,040.55	50.00%	75,020.27	72.71%	54,545.19
NC_ SAW CustomSC - InmanMills Air Washer Control	540,980.80	50.00%	270,490.40	72.71%	196,666.19
NC_ SAW CustomSC - Schaeffler VFD on 540ton Chiller	234,583.69	50.00%	117,291.84	72.71%	85,279.70

Duke Energy Carolinas
DSM/EE Vintage 1 True Up for the Period June 1, 2009 to December 31, 2010
Residential/Non Residential Demand Response Programs

	DR Spread Sum of NPV of Avoided Costs (Rev Comp)	Sum of NPV of Avoided Costs (Rev Comp)	Sharing per Settlement	DR Spread System Revenue	System Revenue	North Carolina Allocation	Sum of Rev - DR Spread
2009	6,224,314.59	12,050,379.05		4,668,235.94	9,037,784.29		3,446,045.11
PWRMGR		4,127,165.42					2,284,974.20
NC_ PowerManager SC	4,127,165.42	4,127,165.42	75.00%	3,095,374.07	3,095,374.07	73.82%	2,284,974.20
PWRSHR		7,923,213.63					1,161,070.92
NC_ PS NC Mandatory	206,234.37	1,711,456.88	75.00%	154,675.78	1,283,592.66	73.82%	114,180.11
NC_ PS SC Generator	35,518.68	148,819.83	75.00%	26,639.01	111,614.87	73.82%	19,664.65
NC_ PS SC Mandatory	1,855,396.12	6,062,936.92	75.00%	1,391,547.09	4,547,202.69	73.82%	1,027,226.16
2010	31,540,453.19	35,543,193.26		23,655,339.89	26,657,394.94		17,691,678.21
PWRMGR		16,589,326.29					9,305,288.69
NC_ PowerManager NC	12,146,936.64	12,146,936.64	75.00%	9,110,202.48	9,110,202.48	74.79%	6,813,462.48
NC_ PowerManager SC	4,442,389.65	4,442,389.65	75.00%	3,331,792.24	3,331,792.24	74.79%	2,491,826.22
PWRSHR		18,953,866.97					8,386,389.52
NC_ PS NC Generator	380,288.89	380,288.89	75.00%	285,216.67	285,216.67	74.79%	213,311.73
NC_ PS NC Mandatory	4,193,964.65	5,839,865.19	75.00%	3,145,473.49	4,379,898.89	74.79%	2,352,479.61
NC_ PS SC CallOption 15_5	6,684.17	12,254.32	75.00%	5,013.13	9,190.74	74.79%	3,749.29
NC_ PS SC Generator	285,792.23	343,489.49	75.00%	214,344.17	257,617.12	74.79%	160,306.64
NC_ PS SC Mandatory	10,084,396.96	12,377,969.07	75.00%	7,563,297.72	9,283,476.80	74.79%	5,656,542.25

Duke Energy Carolinas
Net Lost Revenue Rates for Vintage 1 True up and Vintage 3 Estimate
Summary Net Lost Revenue Rates

Net Lost Revenue Rates	Non Residential				
	June 09-Aug 09	Sept 09-Dec 09	Jan 10-Aug 10	Sep 10-Dec 10	2012 Est
kWh	$ 1.24786	$ 1.41989	$ 1.37328	$ 0.89020	$ 1.10902
VOM (2009)	$ (0.27815)	$ (0.27815)	$ (0.27815)	$ (0.27815)	$ (0.27815)
Total kWh LR	**$ 0.96972**	**$ 1.14174**	**$ 1.09513**	**$ 0.61206**	**$ 0.83087**
Total kW LR	**$ 8.04733**	**$ 8.04733**	**$ 9.44843**	**$ 9.44843**	**$ 9.44843**

Net Lost Revenue Rates	Residential				
	June 09-Aug 09	Sept 09-Dec 09	Jan 10-Aug 10	Sep 10-Dec 10	2012 Est
kWh	$ 5.43566	$ 5.60359	$ 5.84375	$ 5.33009	$ 5.70169
VOM (2009)	$ (0.27815)	$ (0.27815)	$ (0.27815)	$ (0.27815)	$ (0.27815)
Total kWh LR	**$ 5.15751**	**$ 5.32544**	**$ 5.56560**	**$ 5.05194**	**$ 5.42354**