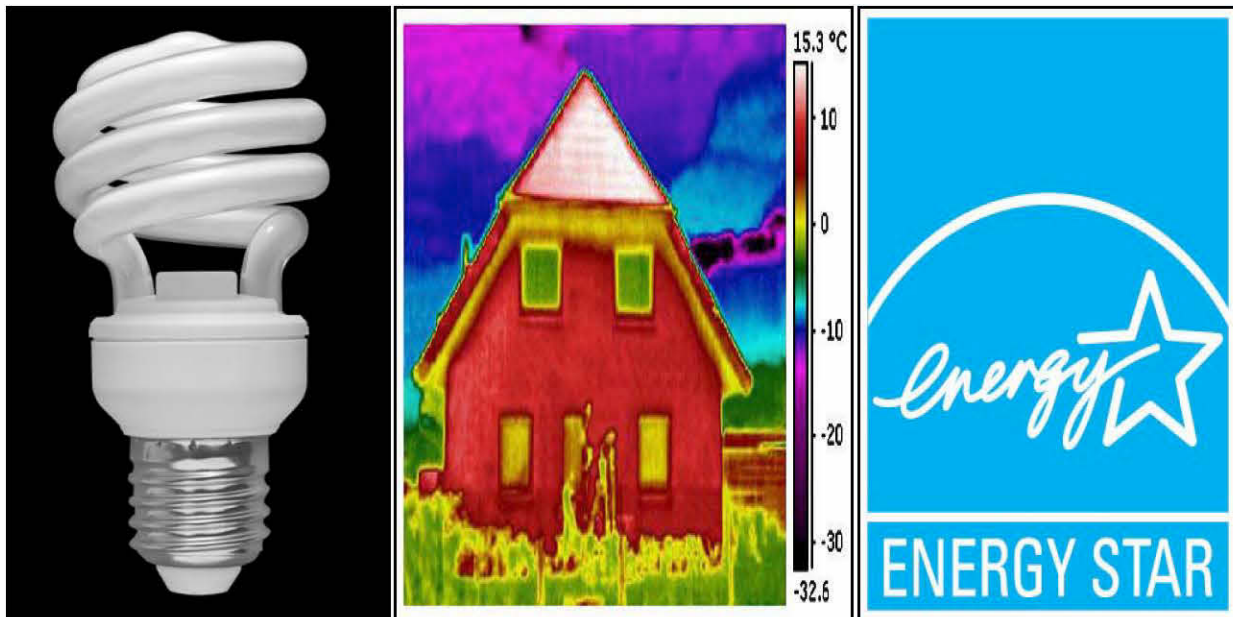


# Saving Energy, Saving Money:

How South Carolina's Electric and Natural Gas Utilities Are Using Demand-Side Management to Help Customers Reduce Their Energy Bills

2011



A Report by the  
South Carolina Energy Office,  
South Carolina Budget and  
Control Board

SC ENERGY OFFICE



SC BUDGET AND CONTROL BOARD

**Saving Energy, Saving Money:**

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Reduce Their Energy Bills**

**2011**

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## **Executive Summary**

Demand-side management (“DSM”) is a strategy that electric and natural gas utilities employ to decrease or defer demand for their energy services.

DSM directly benefits utilities by reducing their need for wholesale energy resources, pollution controls, and/or and expensive investments in generation, transmission, and distribution infrastructure. These cost savings may be passed onto utility customers in the form of lower utility rates. In addition, utility customers directly benefit from DSM through reductions in their monthly energy consumption and cost, as well as (in most cases) utility-provided incentive payments. Utilities are also encouraged by state legislative and regulatory incentives and mandates to increase their adoption of DSM.

South Carolina’s three large investor-owned electric utilities (Duke Energy Carolinas, Progress Energy Carolinas, and South Carolina Electric & Gas Company) and state-owned Santee Cooper all offered a broad range of DSM programs in 2011. South Carolina’s twenty electric cooperatives implemented a number of pilot DSM initiatives. Eight of South Carolina’s municipal electric utilities also conducted DSM activity, including utilities serving cities as large as Rock Hill and as small as Abbeville. Together, these utilities provided 98% of the electricity purchased by South Carolina customers from electric utilities.

Both of South Carolina’s investor-owned natural gas distribution utilities (Piedmont Natural Gas Company and South Carolina Electric & Gas Company) offered DSM programs in 2011. In addition, six of South Carolina’s municipal natural gas utilities conducted DSM activities. Together, these utilities provided 91% of the natural gas purchased by South Carolina customers from natural gas utilities.

## **Definition of Terms Used in This Report**

**Conservation**—A reduction in energy consumption that corresponds with a reduction in service demand. Service demand can include buildings-sector end uses such as lighting, refrigeration, and heating; or industrial processes. Unlike energy efficiency, which is typically a technological measure, conservation is better associated with behavior. Examples of conservation include adjusting the thermostat to reduce the output of a heating unit and using occupancy sensors that turn off lights or appliances.<sup>1</sup>

**Cubic foot (CF)**—A unit of natural gas volume equal to that contained at standard temperature and pressure (60 degrees Fahrenheit and 14.73 pounds standard per square inch) in a cube whose edges are one foot long.<sup>1</sup> Retail sales of natural gas are often measured in cubic feet.

**Demand response**—(See “Load management”)

**Demand-side management (DSM)**<sup>2</sup>—The use of energy efficiency, conservation, and load management programs/activities that help to decrease or defer consumption of energy services.

**Energy efficiency**—A reduction in the energy used by specific end-use devices and systems, typically without affecting the services provided. These programs reduce overall energy consumption, often without explicit consideration for the timing of program-induced savings. Such savings are generally achieved by substituting technologically more advanced equipment to produce the same level of end-use services (e.g. lighting, heating, motor drive) with less energy. Examples include high-efficiency appliances, efficient lighting programs, high-efficiency heating, ventilating and air conditioning (HVAC) systems or control modifications, efficient building design, advanced electric motor drives, and heat recovery systems.<sup>1</sup>

**Gigawatt (GW)**—One billion watts. (See “Watt”)

**Gigawatt-hour (GWh)**—One billion watt-hours. (See “Watt-hour”)

**Kilowatt (kW)**—One thousand watts. (See “Watt”)

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<sup>1</sup> These definitions were adapted from the United States Energy Information Administration:  
<http://www.eia.gov/tools/glossary/>

<sup>2</sup> Some utilities use the term “demand-side management” to specifically describe programs that reduce peak demand, using the terms “energy efficiency” or “conservation” to specifically refer to programs which reduce overall energy use. For the purpose of this report, “demand-side management” refers to all programs that reduce consumption of utility-delivered electricity or natural gas, whether by reducing peak demand or reducing overall energy use.

**Kilowatt-hour (kWh)**—One thousand watt-hours. (See “Watt-hour”)

**Load management**—Utility demand management practices directed at reducing the maximum demand on a system and/or modifying the peak demand of one or more classes of service to better meet the utility system capability for a given hour, day, week, season, or year.<sup>1</sup>

**Megawatt (MW)**—One million watts. (See “Watt”)

**Megawatt-hour (MWh)**—One million watt-hours. (See “Watt-hour”)

**Peak demand**—The energy requirement of electric or natural gas customers at the point in the day, season, and/or year when need for energy is greatest. Utility generation, transmission, and distribution resources must be sufficient to accommodate peak demand requirements, making peak demand an important factor in utility resource planning

**Qualified Facilities (QF)** are defined by the Public Utilities Regulatory Policies Act of 1978 as both 1) small power production facilities using renewable fuel sources, such as wind, solar, hydroelectric, biomass, waste, or geothermal; and 2) cogeneration facilities that produce both electricity and thermal energy in a way that is more efficient than the separate production of both forms of energy. Utility companies are required to purchase power from qualified facilities at a price equivalent to the avoided cost of additional generation.

**Therm**—A unit of heat equal to 100,000 BTU. Retail sales of natural gas are often measured in therms.

**Thermal envelope**—An enclosure—such as the walls, windows, doors, ceiling, and floor of a building—that holds warm or cool air.

**Volt**—A measure of electric potential or electromotive force. The voltage of utility-delivered electricity is sometimes reduced to manage capacity constraints during periods of peak demand.

**Watt**—A unit of electrical power equal to one ampere under a pressure of one volt. A watt is equal to 1/746 horse power. Watts are used in the measurement of peak demand for electricity.

**Watt-hour**—A unit of work or energy, defined as one watt of power expended for one hour. (For example, a 60-watt light bulb operated for one hour consumes 60 watt-hours of electricity.) Watt-hours are used in the measurement of electricity consumption.

## **Introduction**

Demand-side management (“DSM”) is a strategy that electric and natural gas utilities employ to help to decrease or defer consumption of their energy services.

As fossil fuel combustion grows more expensive and the process of adding generation, transmission, and distribution capacity becomes increasingly difficult, some utilities are finding that reducing the growth in demand for their services is more cost-effective at the margin than continuing to expand their supply capacity. Utilities have also been encouraged by state legislative and regulatory incentives and mandates to increase their adoption of DSM.

DSM activities generally fall under the following categories:

- Energy efficiency, which reduces energy consumption without requiring customers to sacrifice the benefits received from energy (e.g.—installing building insulation, purchasing efficient appliances);
- Conservation, which reduces energy consumption by requiring customers to decrease their utilization of energy-consuming devices (e.g.—reducing thermostat temperature, turning off lights)<sup>3</sup>;
- Load management, which reduces customer demand for energy during periods of peak demand (such as daylight hours or summer months) when capacity is limited and the cost of energy provision is high; and
- Public information, which encourages customer participation in energy efficiency, conservation, and/or load management programs or behaviors through public campaigns, direct-to-customer communication, or increasing customer access to information about their consumption of energy services.

DSM directly benefits utilities in the following ways:

- Distribution-only utilities avoid having to purchase additional peaking and baseload energy resources from the wholesale energy market.

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<sup>3</sup> In 2011, there were no active utility DSM programs in South Carolina that directly encouraged energy conservation. However, many utility public information programs had the effect of indirectly encouraging energy conservation.



- Electricity-generating utilities avoid the cost of securing fuel and pollution abatement for peaking and baseload power plants, while deferring expensive investments in new power plants and their associated compliance costs.
- Both kinds of utilities avoid costly investments in new transmission and distribution infrastructure.

Utilities may in turn pass these savings on to consumers, resulting in lower utility bills.

In addition, DSM directly benefits utility customers in the following ways:

- Many DSM programs provide financial incentives (such as rebates, bill credits, lower rates, or low-interest financing) to encourage customers to make choices that reduce their energy consumption overall or during periods of peak demand.
- By encouraging customers to reduce their energy usage or to consume energy during times when energy services are less costly, DSM programs help customers to reduce their monthly utility bill.

The following report is intended to inform utility customers, consumer advocates, state and local policymakers, and energy market professionals about DSM activity undertaken by South Carolina's electric and natural gas utilities in 2011. This report is based entirely on utility responses to the South Carolina Energy Office's requests for information, as required by South Carolina Code of Laws Section 58-37-30 (see Appendix A). If you would like to learn more about a particular electric or natural gas utility's DSM programs, please contact the customer services department of that utility for additional information.

## **Current and Projected Energy Savings from Demand-Side Management by Utilities Operating in South Carolina**

- **South Carolina Electric Cooperatives'** demand response program is estimated to reduce peak electricity demand by 100 MW during winter months and 40 MW during summer months.
- **Duke Energy Carolina's** DSM activity was estimated to reduce electricity consumption 271,026 MWh in 2011 and reduce peak demand between 814 and 894 MW in 2011. They are expected to reduce electricity consumption between 4,737,095 and 9,460,367 MWh in 2025 and reduce peak electricity demand between 1,642 and 2,448 MW in 2025.<sup>4</sup>
- **Progress Energy Carolina's** DSM programs initiated after 2007 were estimated to reduce electricity consumption 355,120 MWh in 2011 and reduce peak demand 253 MW in 2011. They are expected to reduce electricity consumption 2,578,830 MWh in 2025 and reduce peak electricity demand 1,328 MW in 2025. (These savings are in addition to the impact of Progress's pre-existing DSM activity.)<sup>5</sup>
- **South Carolina Electric & Gas Company's** DSM activity was estimated to reduce electricity consumption 72,000 MWh in 2011 and reduce peak electricity demand 234 MW in 2011. They are expected to reduce electricity consumption 1,285,000 MWh in 2025 and reduce peak electricity demand 435 MW in 2025<sup>5</sup>
- **Santee Cooper's** DSM activity was estimated to reduce electricity consumption 16,941 MWh in 2011.

Please see the sections below for more information about actual and projected energy savings and other benefits from utility DSM activity undertaken in 2011.

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<sup>4</sup> These estimates were developed for annual Integrated Resource Plans submitted by investor-owned utilities to the Public Service Commission of South Carolina.

## **South Carolina Electric Utilities—Summary**

Of the 46 electric utilities in South Carolina, 32 had ongoing DSM activity in 2011. These utilities together represented 98% of retail electricity sales by electric utilities in 2010.<sup>5</sup>

In summary, their ongoing DSM activity consisted of—

### Energy Efficiency:

- Three electric utilities provided financial incentives (such as payments or lower rates) to builders and/or building occupants to promote energy efficient new construction.
- Twelve electric utilities offered financial incentives (such as lower rates, bill credits, or financing) to building occupants to encourage energy efficiency improvements in existing structures.
- Six electric utilities offered on-site energy assessments to customers, providing trained personnel to evaluate facilities and suggest methods for improving energy efficiency.
- Three electric utilities implemented energy efficiency and weatherization programs targeting low-income customers, giving personalized assistance and financial support to enable these customers to make needed home improvements and lower their monthly electric bill.
- Five electric utilities offered financial incentives (such as lower rates, rebates, or low-interest financing) for the purchase and/or installation of energy efficient appliances, equipment, and/or lighting.

### Load Management:

- Twenty-three electric utilities offered financial incentives (such as bill credits) to customers that opted to allow utilities to control their peak load by curtailing the operation of certain appliances or equipment (such as water heaters or HVAC systems) during periods of peak demand.
- Five electric utilities offered financial incentives (such as bill credits or lower rates) to customers that agreed to partially or completely halt electricity consumption, or allowed the utility to interrupt service, during periods of peak demand.

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<sup>5</sup> Source: United States Energy Information Administration, EIA-861 (2010):  
<http://www.eia.gov/cneaf/electricity/page/eia861.html>

- Six electric utilities offered rates that reflected time-of-use, real-time, and/or seasonal capacity constraints and marginal generation costs during periods of peak demand.
- One electric utility provided incentives for customers to switch to on-site standby electricity generation during periods of peak demand.
- One electric utility offered lower rates for the operation of thermal storage equipment to enable shifting of thermal energy demand from peak to off-peak periods.
- Five electric utilities reduced the voltage of electricity delivered to customers during periods of peak demand.<sup>6</sup>

Public Information:

- Five electric utilities maintained websites that offered energy efficiency and conservation tips and/or web-based systems for viewing and analyzing monthly electricity usage and cost.
- One electric utility offered in-home meters that displayed real-time information about customers' current and monthly electricity usage and cost.
- Four electric utilities communicated directly with customers through mailings and/or in-person assistance to publicize utility DSM programs and to offer energy efficiency and conservation tips and services.
- Three electric utilities conducted public outreach campaigns through advertising and/or presence at community events to publicize utility DSM programs and offer energy efficiency and conservation tips.
- Three electric utilities provided instructional programs and/or resources to K-12 schools to promote energy awareness.

Electric utilities reported undertaking the following ongoing DSM activity in 2011:

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<sup>6</sup> Voltage reduction is unique among the listed measures in that it is implemented across an entire service area; utility customers are usually not able to opt out of voltage reduction events. Voltage reduction might be undesirable to customers who require high voltage levels and disadvantageous to utilities attempting to maximize revenue by delivering (and charging for) the highest allowable voltage. However, voltage is typically reduced to levels that are acceptably safe and conducive to the operation of most appliances, and utilities typically implement voltage reduction only as a last resort when facing temporary capacity constraints. Conservative application of voltage reduction using advanced grid technologies is growing increasingly accepted as a cost-effective way to reduce customer energy bills and lessen the need for new peaking power generation and distribution capacity.

### South Carolina Electric Utilities: Summary of Demand-Side Management (2011)

Electric Utility Name	Ownership	Energy Efficiency					Load Management					Public Information				
		New Building Efficiency Incentives	Existing Building Retrofit Incentives	On-Site Energy Assessments	Low-Income Efficiency and Weatherization Assistance	Equipment and Lighting Incentives	Load Control Incentives	Interruptible Service Incentives	Time-of-Use or Seasonal Rates	Standby Generation Incentives	Thermal Storage Incentives	Voltage Reduction	Web-Based Customer Tips and Tools	In-Home Real-Time Energy Monitoring	Direct-to-Customer Communication	Public Campaigns
City of Abbeville	Municipal			✓								✓		✓		
Bamberg Board of Public Works	Municipal															
City of Bennettsville	Municipal															
City of Camden	Municipal										✓					
City of Clinton	Municipal															
Town of Due West	Municipal															
Duke Energy Carolinas	Investor-Owned			✓	✓	✓	✓	✓	✓							✓
Easley Combined Utility System	Municipal										✓					
Electric Cooperatives (20 Co-ops)	Cooperative		✓*				✓									
Gaffney Board of Public Works	Municipal															
City of Georgetown	Municipal															
Greenwood CPW	Municipal															
Greer CPW	Municipal			✓				✓				✓				
Laurens CPW	Municipal															
Lockhart Power Company	Investor-Owned															
McCormick CPW	Municipal															
City of Newberry	Municipal															
Orangeburg DPU	Municipal			✓				✓								
Progress Energy Carolinas	Investor-Owned	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Town of Prosperity	Municipal															
City of Rock Hill	Municipal					✓	✓	✓			✓				✓	
Santee Cooper	State-Owned	✓	✓	✓	✓*	✓		✓				✓		✓	✓	✓
Seneca Light & Water Plant	Municipal															
South Carolina Electric & Gas Co.	Investor-Owned	✓	✓	✓		✓		✓	✓	✓		✓	✓	✓	✓	
City of Union	Municipal										✓					
Westminster CPW	Municipal							✓								
Town of Winnsboro	Municipal															

Source: South Carolina Energy Office, annual survey of utilities  
 \* Pilot programs

Saving Energy: Saving Money: How South Carolina's Electric and Natural Gas Utilities Are Using Demand-Side Management to Help Customers Reduce Their Energy Bills (2011)

Electric utilities submitted narrative descriptions of their 2011 DSM activity in response to SCEO requests for information. These descriptions are as follows, categorized by utility ownership. (The following descriptions are presented as submitted by each utility, with the exception of minor edits performed to ensure relevance to the scope of this report and consistency with its format):

## **Electric Cooperatives**

Central Electric Power Cooperative is reporting on behalf of 20 electric cooperative distribution companies in South Carolina. Here is a summary of their DSM and energy efficiency programs for the year 2011.

### **DSM**

There is an active demand response program whereby peak demands are minimized via electric water heater control. Central and its member cooperatives are conserving approximately 100 MW during winter months and 40 MW during summer months. This is a longstanding program, and was established almost 30 years ago. While most of the switches are controlled via a radio signal, South Carolina distribution cooperatives are increasingly turning to smart-grid applications, using power line carrier technology in order to communicate.

Horry Electric has undertaken another smart grid application for DSM – the cooperative has a 30 sample test project presently underway, whereby real-time information is collected over the internet for individual household heating/cooling, and water heating load. Horry Electric is testing the ability to manage expensive peak demand times, through a choreographed approach to demand control. The results of their efforts should be known by the end of 2012.

Palmetto Electric undertook a detailed study during 2011, in order to measure the impact of voltage reduction, and corresponding load reduction, during expensive peak hours. Their study was for the summer only. Palmetto Electric conducted voltage reduction tests during this past winter, and are in process of analyzing the information. This study has received national attention, for its detail and thoroughness.

### **Energy Efficiency**

Central and eight of its member distribution cooperatives are currently engaged in a research pilot that offers retail members low-interest loans for home weatherization utilizing the recently enacted South Carolina on-bill financing statute. Using a grant from the Doris Duke Charitable Foundation, the Washington, DC-based Environmental and Energy Study Institute, a bipartisan policy group that advises Congress on energy matters, will observe and collect data. At the end of 2011, 126 homes had taken advantage of the pilot offering. During 2012, South Carolina cooperatives will collect electricity use from pilot participants, in order to assess the overall impact on energy and peak demand.

In the fall of 2009, Central applied for and was awarded a \$2.9M grant to identify and install energy efficiency measures in manufactured homes. These measures included heat pump upgrades and ductwork improvement, replacing existing roofs with cool roofs, replacing older appliances with Energy Star new appliances and weatherization. For each measure, we were to identify 200 homes and make the improvements. This process was applied to all measures except weatherization, for which we used the local Community Action Agencies to perform the work. Seventy nine of the weatherized homes are included in our program. In addition to the above, in home displays, or energy monitors for the homeowner, were installed on 400 manufactured and stick built homes. The work was completed in early 2011. An outside consultant was hired to install measurement and verification equipment, and to provide Central with an independent impact assessment. Central's report on this has been delivered to the South Carolina Energy Office.

Central also just finished a solar thermal water heater pilot program made possible by a grant from the South Carolina Energy Office. Seventy homes across the state received a solar hot water heater upgrade in the fall of 2010. The energy and water use was monitored by an outside contractor for a year following the upgrade. A final report on this project was prepared and delivered to the Energy Office.



## **Investor-Owned Electric Utilities**

### **Duke Energy Carolinas:**

In May 2007, Duke Energy Carolinas filed its application for approval of EE and DSM programs under its save-a-watt initiative. The Company received the final order for approval for these programs from the NCUC in July 2010 and from the PSC in May 2009.

Duke Energy Carolinas uses EE and DSM programs to help manage customer demand in an efficient, cost-effective manner. These programs can vary greatly in their dispatch characteristics, size and duration of load response, certainty of load response, and level and frequency of customer participation. In general, programs are offered in two primary categories: EE programs that reduce energy consumption (conservation programs) and DSM programs that reduce energy demand (demand-side management or demand response programs and certain rate structure programs).

The following are the current EE and DSM programs in place in the Carolinas:

#### **Demand Response – Load Control Curtailment Programs**

These programs can be dispatched by the utility and have the highest level of certainty. Once a customer agrees to participate in a demand response load control curtailment program, the Company controls the timing, frequency, and nature of the load response. Duke Energy Carolinas' current load control curtailment programs are:

- Power Manager® - Power Manager is a residential load control program. Participants receive billing credits during the billing months of July through October in exchange for allowing Duke Energy Carolinas the right to cycle their central air conditioning systems and, additionally, to interrupt the central air conditioning when the Company has capacity needs.

#### **Demand Response – Interruptible and Related Rate Structures**

These programs rely either on the customer's ability to respond to a utility-initiated signal requesting curtailment or on rates with price signals that provide an economic incentive to reduce or shift load. Timing, frequency and nature of the load response depend on customers' actions after notification of an event or after receiving pricing signals. Duke Energy Carolinas' current interruptible and time-of-use curtailment programs include:

- PowerShare® is a non-residential curtailment program consisting of four options: an emergency only option for curtailable load (PowerShare® Mandatory), an emergency only option for load curtailment using on-site generators (PowerShare® Generator), an economic based voluntary option (PowerShare® Voluntary), and a combined emergency and economic option that allows for increased notification time of events (PowerShare® CallOption).
  - PowerShare® Mandatory: Participants in this emergency only option will receive capacity credits monthly based on the amount of load they agree to curtail during utility-initiated emergency events. Participants also receive energy credits for the load curtailed during events. Customers enrolled may also be enrolled in PowerShare® Voluntary and eligible to earn additional credits.

- PowerShare® Generator: Participants in this emergency only option will receive capacity credits monthly based on the amount of load they agree to curtail during utility-initiated emergency events and their performance during monthly test hours. Participants also receive energy credits for the load curtailed during events.
- PowerShare® Voluntary: Enrolled customers will be notified of pending emergency or economic events and can log on to a Web site to view a posted energy price for that particular event. Customers will then have the option to participate in the event and will be paid the posted energy credit for load curtailed.
- PowerShare® CallOption: This DSM program offers a participating customer the ability to receive credits when the customer agrees, at the Company's request, to reduce and maintain its load by a minimum of 100 kW during Emergency and/or Economic Events. Credits are paid for the load available for curtailment, and charges are applicable when the customer fails to reduce load in accordance with the participation option it has selected. Participants are obligated to curtail load during emergency events. CallOption offers four participation options to customers: PS 0/5, PS 5/5, PS 10/5 and PS 15/5. All options include a limit of five Emergency Events and set a limit for Economic Events to 0, 5, 10 and 15 respectively.
- Rates using price signals
  - Residential Time-of-Use (including a Residential Water Heating rate): This category of rates for residential customers incorporates differential seasonal and time-of-day pricing that encourages customers to shift electricity usage from on-peak time periods to off-peak periods. In addition, there is a Residential Water Heating rate for off-peak water heating electricity use.
  - General Service and Industrial Optional Time-of-Use rates: This category of rates for general service and industrial customers incorporates differential seasonal and time-of-day pricing that encourages customers to use less electricity during on-peak time periods and more during off-peak periods.
  - Hourly Pricing for Incremental Load: This category of rates for general service and industrial customers incorporates prices that reflect Duke Energy Carolinas' estimation of hourly marginal costs. In addition, a portion of the customer's bill is calculated under their embedded-cost rate. Customers on this rate can choose to modify their usage depending on hourly prices.

## Energy Efficiency Programs

These programs are typically non-dispatchable, conservation-oriented education or incentive programs. Energy and capacity savings are achieved by changing customer behavior or through the installation of more energy-efficient equipment or structures. All effects of these existing programs are reflected in the customer load forecast. Duke Energy Carolinas' existing conservation programs include:

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

- The 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. In addition, the customer receives CFLs as an incentive to participate in the program.

The PER program requires customers to provide information about their home, number of occupants, equipment and energy usage and has two variations:

- A mailed offer where customers are asked to complete an included energy survey and mail it back to Duke Energy or complete the same survey online. Customers mailing the energy survey receive their PER in the mail and those completing it online receive their PER online as a printable PDF document.
  - An online offer to our customers that have signed into our Online Services (OLS) bill pay and view environment. Online participants complete their energy survey online get their PER online as a printable PDF.
- 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 to allow the customer to begin saving immediately.
- Low Income Energy Efficiency and Weatherization Program: The purpose of this program is to assist low income residential customers with demand-side management measures to reduce energy usage through energy efficiency kits or through assistance in the cost of equipment or weatherization measures.
  - Energy Efficiency Education Program for Schools: The purpose of this program is to educate students about sources of energy and energy efficiency in homes and schools through a curriculum provided to public and private schools. This curriculum includes lesson plans, energy efficiency materials, and energy audits.
  - Residential Smart Saver® Energy Efficient Products Program: The Smart Saver® Program provides incentives to residential customers who purchase energy-efficient equipment. The program has two components – CFLs and high-efficiency air conditioning equipment.
    - The CFL program is designed to offer incentives to customers and increase energy efficiency by installing CFLs in high use fixtures in the home. The incentives have been offered in a variety of ways. The first deployment of this program distributed free coupons to be redeemed by the customer at a variety of retail stores. Later deployments used business reply cards and a web-based on-demand ordering tool where CFLs are shipped directly to the customer's home.

- The residential air conditioning program provides incentives to customers, builders, and heating contractors (HVAC dealers) to promote the use of high-efficiency air conditioners and heat pumps. The program is designed to increase the efficiency of air conditioning systems in new homes and for replacements in existing homes.
- Smart Saver® for Non-Residential Customers: The purpose of this program is to encourage the installation of high-efficiency equipment in new and existing non-residential establishments. The program provides incentive payments to offset a portion of the higher cost of energy-efficient equipment. The following types of equipment are eligible for incentives as part of the Prescriptive program: high-efficiency lighting, high-efficiency air conditioning equipment, high-efficiency motors, high-efficiency pumps, variable frequency drives, food services and process equipment. Customer incentives may be paid for other high-efficiency equipment as determined by the Company to be evaluated on a case-by-case basis through the Custom program.

## **Progress Energy Carolinas:**

### **New (post-2007) Demand Side Management (DSM) and Energy Efficiency (EE) Programs**

Progress Energy Carolinas, Inc. (PEC) continues to pursue a long-term, balanced capacity and energy strategy to meet the future electricity needs of its customers. This balanced strategy includes a strong commitment to demand side management (DSM) and energy efficiency (EE) programs, investments in renewable and emerging energy technologies, and state-of-the art power plants and delivery systems. PEC currently has the following seven EE programs, three DSM programs and one pilot program that have been approved by both the North Carolina Utilities Commission and the Public Service Commission of South Carolina:

#### ***Energy Efficiency Programs***

- Residential Home Energy Improvement
- Residential Home Advantage
- Residential Neighborhood Energy Saver (Low-Income)
- Residential Lighting Program
- Residential Appliance Recycling Program
- Residential Energy Efficient Benchmarking Program
- Commercial, Industrial, and Governmental (CIG) Energy Efficiency

#### ***Demand Response Programs***

- Residential EnergyWise Home<sup>SM</sup>
- CIG Demand Response Automation Program
- Distribution System Demand Response (DSDR) Program

#### ***Pilot Programs***

- Solar Water Heating Pilot Program

#### **Energy Efficiency Programs**

- **Residential Home Energy Improvement Program**: The Residential Home Energy Improvement Program offers PEC customers a variety of energy conservation measures designed to increase energy efficiency for existing residential dwellings that can no longer be considered new construction. The prescriptive menu of energy efficiency measures provided by the program allows customers the opportunity to participate based on the needs and characteristics of their individual homes. Financial incentives are provided to participants for each of the conservation measures promoted within this program. The program utilizes a network of pre-qualified contractors to install each of the following energy efficiency measures:
  - High-Efficiency Heat Pumps and Central A/C
  - Duct Testing & Repair
  - HVAC Tune-up
  - Insulation Upgrades/Attic Sealing
  - Window Replacement

The Residential Home Energy Improvement program was launched in July 2009. Through July 31, 2011, there have been 44,412 participants contributing 11,503 MWh in net annualized energy savings and 11,100 kW in peak demand savings.

- Residential Home Advantage (New Construction) Program: The Residential Home Advantage Program offers developers and builders the potential to maximize energy savings in various types of new residential construction. The program utilizes a prescriptive approach for developers and builders of projects for single-family, multi-family (three stories or less), and manufactured housing units (SC only). The program is also available to high rise multi-family units that are currently not eligible for ENERGY STAR® as long as each unit meets the intent of the ENERGY STAR® builder option package for their climate zone and the Home Advantage Program criteria.

The primary objectives of this program are to reduce system peak demands and energy consumption within new homes. New construction represents a unique opportunity for capturing cost effective DSM and EE savings by encouraging the investment in energy efficiency features that would otherwise be impractical or more costly to install at a later time. These are often referred to as lost opportunities.

Since the launch of the Residential Home Advantage program in December 2008, there have been 2,253 participants through July 31, 2011, contributing 5,153 MWh in net annualized energy savings and 1,790 kW in peak demand savings.

- Residential Neighborhood Energy Saver (Low-Income) Program: PEC's Neighborhood Energy Saver Program was launched in October 2009 to assist low-income residential customers with the implementation of energy conservation. The program provides assistance to low-income families by installing a comprehensive package of energy conservation measures that lower energy consumption at no cost to the customer. Prior to installing measures, an energy assessment is conducted on each residence to identify the appropriate measures to install. In addition to the physical installation of measures, an important component of the Neighborhood Energy Saver program is the provision for one-on-one energy education. Each household receives education on energy saving techniques that encourage behavioral changes to help reduce and control their energy usage.

As of July 31, 2011, measures have been installed in 8,206 homes. These installed measures contributed 7,624 MWh in net annualized energy savings and 1,176 kW in peak demand savings.

- Residential Lighting Program: PEC has partnered with various manufacturers and retailers across its entire service territory to offer ENERGY STAR® qualified lighting products to its customers. PEC's Residential Lighting Program was launched in January 2010 to provide both customer incentives, in the form of reduced pricing, and marketing support to retailers in order to encourage a greater adoption of ENERGY STAR® qualified or other high efficiency lighting products. The program promotes the purchase of these products using in-store and on-line promotions. PEC is also promoting a greater awareness of these products using special retail and community events. The early years of the program focus on compact fluorescent light bulbs (CFLs), with the intent to add newer lighting technologies as they become available and cost-effective.

Through July 31, 2011, 5,005,376 CFLs have been sold through the Residential Lighting Program, contributing 107,755 MWh in net annualized energy savings and 10,231 kW in peak demand savings.

Prior to implementation of the Residential Lighting Program, PEC ran a CFL Buy-Down Pilot during the last quarter of 2007 which accounted for 203,222 bulbs sold and contributed 6,706 MWh in annualized net energy savings and 630 kW in peak demand savings.

- **Residential Appliance Recycling Program:** The Appliance Recycling Program is designed to reduce energy usage by removing less efficient refrigerators and freezers that are operating within residences across the PEC service territory. The program provides residential customers with free pick-up and an incentive of \$50 for allowing PEC to collect and recycle their less efficient refrigerator or freezer and permanently remove the unit from service.

The Residential Appliance Recycling Program was launched in April 2010. As of July 31, 2011, there have been 9,873 participants contributing 6,523 MWh in net annualized energy savings and 759 kW in peak demand savings.

- **Residential Energy Efficient Benchmarking Program:** The Residential Energy Efficient Benchmarking Program is designed to reduce residential electrical consumption by applying behavioral science principals in which eligible customers receive reports that compare their energy use with neighbors in similar homes. Participants will be periodically mailed the individualized reports and can elect to switch to on-line reports at any time during the duration of the program. In addition to the household comparative analysis, the reports will provide specific recommendations for reducing energy consumption.

The Residential Energy Efficient Benchmarking Program was launched in July 2011. As of July 31, 2011, there have been 50,121 participants contributing 14,424 MWh in net annualized energy savings and 2,589 kW in peak demand savings.

- **Commercial, Industrial, and Governmental (CIG) Energy Efficiency Program:** The CIG Energy Efficiency Program is available to all CIG customers interested in improving the energy efficiency of their new construction projects or existing facilities. New construction incentives provide an opportunity to capture cost effective energy efficiency savings that would otherwise be impractical or more costly to install at a later time. The retrofit market offers energy saving opportunities for CIG customers with older, energy inefficient electrical equipment. The program includes prescriptive incentives for measures that address the following major end-use categories:

- HVAC
- Lighting
- Motors & Drives
- Refrigeration

In addition, the program offers incentives for custom measures to specifically address the individual needs of customers in the new construction or retrofit markets, such as those with more complex applications or in need of energy efficiency opportunities not covered by the prescriptive measures. The program also seeks to meet the following overall goals:

- Educate and train trade allies, design firms and customers to influence selection of energy efficient products and design practices.

- Educate CIG customers regarding the benefits of energy efficient products and design elements and provide them with tools and resources to cost-effectively implement energy-saving projects.

The CIG Energy Efficiency program was launched in April 2009. As of July 31, 2011, there have been 1,183 participants contributing 71,438 MWh in net annualized energy savings and 15,871 kW in peak demand savings.

## Demand Response Programs

- Residential EnergyWise Home<sup>SM</sup> Program: The Residential EnergyWise Home<sup>SM</sup> Program is a direct load control program that allows PEC, through the installation of load control switches at the customer's premise, to remotely control the following residential appliances:
  - Central air conditioning or electric heat pumps

For each of the control options above, an initial one-time bill credit of \$25 following the successful installation and testing of load control device(s) and annual bill credits of \$25 will be provided to program participants in exchange for allowing PEC to control the listed appliances.

The program provides PEC with the ability to reduce and shift peak loads, thereby enabling a corresponding deferral of new supply-side peaking generation and enhancing system reliability. Participating customers are impacted by (1) the installation of load control equipment at their residence, (2) load control events which curtail the operation of their air conditioning, heat pump strip heating or water heating unit for a period of time each hour, and (3) the receipt of an annual bill credit from PEC in exchange for allowing PEC to control their electric equipment.

Through July 31, 2011, the Residential EnergyWise Home<sup>SM</sup> Program has 65,399 participants contributing 76,293 kW of summer peak load reduction capability and 4,348 kW of winter peak load reduction capability. From August 1, 2010 through July 31, 2011, there were six Residential EnergyWise Home<sup>SM</sup> Program activations.

PEC has also initiated an investigation into the potential use of its residential load control program for the purposes of generating fuel savings. To accomplish this, PEC is leveraging the equipment and data collection activities associated with the measurement and verification (M&V) for this program being deployed during the summer of 2011 and winter 2011/12. Additionally, information is being collected regarding program overrides, drop-outs, and customer complaints in attempt to help understand the potential downside customer risks associated with dispatching the program for various purposes. Results from these analyses will be addressed in PEC's 2012 IRP filing.

- Commercial, Industrial, and Governmental (CIG) Demand Response Automation Program: The CIG Demand Response Automation Program allows PEC to install load control and data acquisition devices to remotely control and monitor a wide variety of electrical equipment capable of serving as a demand response resources. This program utilizes customer education, enabling two-way communication technologies, and an event-based incentive structure to maximize load reduction capabilities and resource reliability. The primary objective of this program is to reduce PEC's need for additional peaking generation by reducing PEC's seasonal peak load demands, primarily during the summer months, through deployment of load control and data acquisition technologies.



The CIG Demand Response Automation Program was launched in October 2009. As of July 31, 2011, there were 29 active installations in the program contributing 13,382 kW of available load reduction capability. From August 1, 2010 through July 31, 2011, there have been four CIG Demand Response Automation Program control events.

- **Distribution System Demand Response Program (DSDR)**: PEC and other utilities have historically utilized conservation voltage reduction (CVR) to reduce peak demand for short periods of time by lowering system voltage. This practice has been used in a limited fashion due to concerns that some customers could experience voltages below the lowest allowable level. DSDR is a program that enables PEC to increase peak load reduction capability and displace the need for additional future peaking generation capacity by investing in a robust system of advanced technology, telecommunications, equipment, and operating controls. This increased peak load reduction is accomplished while maintaining customer delivery voltage above the minimum requirements. The DSDR Program enables PEC to implement a least cost mix of demand reduction and generation resources that meet the electricity needs of its customers.

## **Pilot Programs**

### **Residential Solar Water Heating Pilot Program**

This pilot program was launched in June 2009 and was designed to provide PEC with the ability to measure and validate the achievable energy savings and coincident peak impacts associated with implementing residential solar water heating in the PEC service territory. Results from the pilot program will enable PEC to determine whether it is cost effective to incorporate solar water heating as part of its least cost mix of demand reduction and generation measures to meet the electricity needs of its customers. The data from this pilot program will also enable PEC to form a validated foundation for determining the future value of energy efficiency rebates or potential REC values, and create a better database of operational characteristics that could be used by other stakeholders (i.e., vendors/installers, developers, homeowners, solar advocates, policy makers, regulators, etc.).

As of July 31, 2011, there are 150 customers participating in the Residential Solar Water Heating Pilot Program, which has a cap of 150 total participants in PEC's service area.

### **Summary of Prospective Program Opportunities**

PEC is considering the following future enhancements to its DSM/EE portfolio: (1) the addition of a small commercial direct install program, (2) expansion of existing programs to include additional measures, (3) program modifications to account for changing market conditions and new measurement and verification (M&V) results, and (4), other EE research & development pilots. Proposed revisions to the Residential Home Energy Improvement program include the addition of high efficiency room air conditioners and heat pump water heaters to the list of measures being promoted by the program and the discontinuation of the level-1 tune-up (coil cleaning) measure. The Residential Home Advantage and Residential Lighting programs are also under review to account for upcoming changes in codes and standards, as well as new lighting technologies.

## DSM and EE Forecasts

On March 16, 2009, a DSM Potential Study Final Report for PEC was completed and issued by ICF International. The primary objective of this study was to characterize the realistically achievable potential for a variety of DSM and EE programs in the PEC service territory under a specific set of assumptions, which included the significant effect of certain large commercial and industrial customers “opting-out” of the programs, thereby reducing the amount of potential that could be developed by PEC. In August 2010, ICF International updated that forecast of PEC’s DSM/EE potential based on updated avoided cost projections and the addition of several measures that were not part of the original study.

While these estimates are suitable for use in long-range system planning models and integrated resource planning, the study did not attempt to closely forecast DSM/EE achievements in the short-term or from year to year. Such an annual accounting is highly sensitive to the nature of programs adopted, the timing of the introduction of those programs, and other factors. In contrast, this study illustrates the approximate DSM/EE impacts that may be possible over an extended time period if the study assumptions hold, as well as the approximate cost of those impacts.

PEC’s forecast of DSM/EE program savings for integrated resource planning purposes are based on the results of the updated potential study. The tables below show the projected composite impacts of all DSM, EE, and DSDR programs implemented since the adoption of North Carolina Senate Bill 3 (SB-3) in 2007, including the expected potential from program growth, program enhancements and future new programs. The tables do not include savings from previously existing programs, such as large load Curtailment Rates or Voltage Control, which will be discussed later in this document.

### **Peak MW Demand Savings for New Post SB-3 DSM/EE (at generator)**

Year	Summer Peak MW Savings				Winter Peak MW Savings			
	DSM	EE	DSDR	Total	DSM	EE	DSDR	Total
2012	139	72	241	453	18	38	241	297
2013	196	107	247	550	27	59	247	333
2014	250	146	253	650	36	86	253	375
2015	289	183	259	731	43	111	259	412
2016	321	219	264	804	45	131	264	440
2017	344	258	268	871	47	154	268	469
2018	360	301	272	933	48	179	272	499
2019	370	348	277	995	49	206	277	532
2020	377	396	281	1,054	51	235	281	567
2021	381	439	286	1,107	51	261	286	598
2022	384	485	290	1,159	52	288	290	630
2023	386	533	295	1,213	52	318	295	665
2024	387	580	299	1,267	52	348	299	700
2025	388	626	304	1,318	52	377	304	733
2026	389	669	309	1,367	53	405	309	766

### Annual MWh Energy Savings (at generator)

Year	DSM	EE	DSDR	Total Savings
2012	2,079	453,767	48,931	504,777
2013	2,927	604,739	49,934	657,600
2014	3,749	770,106	50,883	824,738
2015	4,352	898,617	51,718	954,687
2016	4,827	1,049,971	52,567	1,107,366
2017	5,177	1,189,737	53,360	1,248,274
2018	5,409	1,341,482	54,181	1,401,072
2019	5,562	1,511,254	54,998	1,571,814
2020	5,666	1,653,810	55,837	1,715,313
2021	5,734	1,779,851	56,680	1,842,265
2022	5,774	1,966,779	57,533	2,030,086
2023	5,799	2,155,526	58,399	2,219,724
2024	5,819	2,335,892	59,284	2,400,995
2025	5,835	2,508,257	60,188	2,574,280
2026	5,849	2,672,981	61,127	2,739,957

PEC is planning to commence a new DSM/EE potential study by the end of the year in preparation for the 2012 biennial IRP filing. It has been over three years since work on the original PEC Potential Study began in 2008. All eleven of the DSM/EE programs/pilots reported above were also implemented during this period. Thus, there is good reason to initiate a new DSM/EE potential study. A new study would include the impact of new technologies, account for new appliance efficiency standards and building codes, and incorporate new information regarding appliance saturations, customer growth projections and any other relevant factors affecting electricity use.

#### Previously Existing Demand Side Management and Energy Efficiency Programs

Prior to the passage of North Carolina Senate Bill 3 in 2007, PEC had a number of DSM/EE programs in place. These programs are available in both North and South Carolina and include the following:

##### **Existing Energy Efficiency Programs**

- Energy Efficient Home Program: PEC introduced in the early 1980's an Energy Efficient Home program. This program provides residential customers with a 5% discount of the energy and demand portions of their electricity bills when their homes met certain thermal efficiency standards that were significantly above the existing building codes and standards. Homes that pass an ENERGY STAR® test receive a certificate as well as a 5% discount on the energy and demand portions of their electricity bills. Through December 2010, 281,451 dwellings system-wide qualified for the discount.
- Energy Efficiency Financing: PEC began offering energy efficiency financing for its residential customers through its "Home Energy Loan Program" in 1981. Since the last biennial report,

energy efficiency financing options have now been integrated within PEC’s Residential Home Energy Improvement program.

**Existing Demand Response (DR) Programs**

- **Time-of-Use Rates:** PEC has offered voluntary Time-of-Use (TOU) rates to all customers since 1981. These rates provide incentives to customers to shift consumption of electricity to lower-cost off-peak periods and lower their electric bill.
- **Thermal Energy Storage Rates:** PEC began offering thermal energy storage rates in 1979. The present General Service (Thermal Energy Storage) rate schedule uses two-period pricing with seasonal demand and energy rates applicable to thermal storage space conditioning equipment. Summer on-peak hours are noon to 8 p.m. and non-summer hours of 6 a.m. to 1 p.m. weekdays.
- **Real-Time Pricing:** PEC’s Large General Service (Experimental) Real Time Pricing tariff was implemented in 1998. This tariff uses a two-part real time pricing rate design with baseline load representative of historic usage. Hourly rates are provided on the prior business day. A minimum of 1 MW load is required. This rate schedule is presently fully subscribed.
- **Curtailable Rates:** PEC began offering its curtailable rate options in the late 1970s, and presently has two tariffs whereby industrial and commercial customers receive credits for PEC’s ability to curtail system load during times of high energy costs and/or capacity constrained periods.
- **Voltage Control:** This procedure involves reducing distribution voltage during periods of capacity constraints, representing a potential system reduction of approximately 75 MW. This level of reduction does not adversely impact customer equipment or operations.

Projected summer peak demand savings for all PEC existing and new DSM/EE programs not embedded in the load forecast are presented in the table below:

**Summer Peak MW Demand Savings for All DSM/EE (at generator)**

Year	Pre SB-3 Programs		Post SB-3 Programs	All DSM/EE
	Curtailable Rates	Voltage Control	DSM/EE/DSDR	
2012	275	75	453	803
2013	275	76	550	901
2014	275	78	650	1,003
2015	275	79	731	1,085
2016	275	81	804	1,160
2017	275	82	871	1,228
2018	275	84	933	1,292
2019	275	84	995	1,354
2020	275	86	1,054	1,415
2021	275	88	1,107	1,470
2022	275	89	1,159	1,523

*Saving Energy, Saving Money: How South Carolina’s Electric and Natural Gas Utilities Are Using Demand-Side Management to Help Customers Reduce Their Energy Bills (2011)*

2023	275	90	1,213	1,578
2024	275	92	1,267	1,634
2025	275	93	1,318	1,686
2026	275	95	1,367	1,737

### Summary of Available Existing Demand-Side and Energy Efficiency Programs

The following table provides current information available at the time of this report on PEC’s existing DSM/EE programs (i.e., those programs that were in effect prior to January 1, 2007). This information, where applicable, includes program type, capacity, energy, and number of customers enrolled in the program as of the end of 2010, as well as load control activations since those enumerated in PEC’s last biennial resource plan. The energy savings impacts of these existing programs are embedded within PEC’s load and energy forecasts.

Program Description	Type	Capacity (MW)	Annual Energy (MWH)	Participants	Activations Since Last Biennial Report
Energy Efficiency Programs	EE	488	NA	NA	NA
Real Time Pricing (RTP)	DSM	22	NA	100	NA
Commercial & Industrial TOU	DSM	5	NA	23,689	NA
Residential TOU	DSM	12	NA	28,787	NA
Curtable Rates	DSM	275	NA	86	0
Voltage Control	DSM	75	NA	NA	62

There were no Large Load Curtailment activations during the August 2010 through July 2011 period since PEC’s last biennial resource plan. Voltage reduction was activated 62 times from August 2010 through July 2011.

### Current and Anticipated Consumer Education Programs

In addition to the DSM/EE programs previously listed, PEC also has the following informational and educational programs:

- Customized Home Energy Report
- On Line Account Access
- “Lower My Bill” Toolkit
- Online Energy Saving Tips
- CIG Account Management
- eSMART Kids Website
- SunSense Schools Program
- Community Events

- Customized Home Energy Report: During 2009, PEC launched a new educational tool available to all residential customers called the Customized Home Energy Report. This free tool educates customers about their household energy usage and how to save money by saving energy. The customer answers a questionnaire either online via [www.progresscher.com](http://www.progresscher.com) or through the mail, and then receives a report that details their energy usage and educates them on specific ways to reduce their energy consumption. Additionally, the report provides specific information about energy efficiency programs and rebates offered by Progress Energy that are uniquely applicable to the customer based on data obtained within the questionnaire.
- On Line Account Access: On Line Account Access provides energy analysis tools to assist customers in gaining a better understanding of their energy usage patterns and identifying opportunities to reduce energy consumption. The service allows customers to view their past 24 months of electric usage including the date the bill was mailed; number of days in the billing cycle; and daily temperature information. This program was initiated in 1999.
- “Lower My Bill” Toolkit: This tool, implemented in 2004, provides on-line tips and specific steps to help customers reduce energy consumption and lower their utility bills. These range from relatively simple no-cost steps to more extensive actions involving insulation and heating and cooling equipment.
- Online Energy Saving Tips: PEC has been providing tips on how to reduce home energy costs since approximately 1981. PEC’s web site includes information on household energy wasters and how a few simple actions can increase efficiency. Topics include: Energy Efficient Heat Pumps, Mold, Insulation R-Values, Air Conditioning, Appliances and Pools, Attics and Roofing, Building/Additions, Ceiling Fans, Ducts, Fireplaces, Heating, Hot Water, Humidistats, Landscaping, Seasonal Tips, Solar Film, and Thermostats.
- CIG Account Management: All PEC commercial, industrial, and governmental customers with an electrical demand greater than 200 kW (approximately 4,800 customers) are assigned to a PEC Account Executive (AE). The AEs are available to personally assist customers in evaluating energy improvement opportunities and can bring in other internal resources to provide detailed analyses of energy system upgrades. The AEs provide their customers with a monthly electronic newsletter which includes energy efficiency topics and tips. They also offer numerous educational opportunities in group settings to provide information about PEC’s new DSM and EE program offerings and to help ensure the customers are aware of the latest energy improvement and system operational techniques.
- e-SMART Kids Website: PEC is offering an educational online resource for teachers and students in our service area called e-SMART Kids. The web site educates students on energy efficiency, conservation, and renewable energy and offers interactive activities in the classroom. It is available on the web at <http://progressenergy.e-smartonline.net/>.
- SunSense Schools Program: The SunSense Schools program was available to schools in the PEC service territory during the 2009-2010 school year, and was announced by PEC in March 2009. This solar education program was the first of its kind in the Carolinas, and was designed to give middle and high school students and faculty a unique, hands-on opportunity to learn more about solar energy. Five winning schools received a two-kilowatt solar photovoltaic system installed on their campus along with internet-based tracking equipment that shows the real-time energy

output. Progress Energy was proud to bring this exciting opportunity to local schools. Details on the winning schools and their solar arrays are available at [www.progress-energy.com/sunsense](http://www.progress-energy.com/sunsense).

- Community Events: PEC representatives participated in community events across the service territory to educate customers about PEC's energy efficiency programs and rebates and to share practical energy saving tips. PEC energy experts attended events and forums to host informational tables and displays, and distributed handout materials directly encouraging customers to learn more about and sign up for approved DSM/EE energy saving programs.

## **South Carolina Electric & Gas Company (SCE&G):**

Demand-Side Management (DSM) can be broadly defined as the set of actions that can be taken to influence the level and timing of the consumption of energy. There are two common subsets of Demand Side Management: Energy Efficiency and Load Management (also known as Demand Response). Energy Efficiency typically includes actions designed to increase efficiency by maintaining the same level of production or comfort, but using less energy input in an economically efficient way. Load Management typically includes actions specifically designed to encourage customers to reduce usage during peak times or shift that usage to other times.

### **Energy Efficiency**

SCE&G's Energy Efficiency programs include Customer Information Programs, Web-based information, Energy Conservation and the newly offered Demand Side Management programs. A description of each follows:

- Customer Information Programs: SCE&G's customer information programs fall under two headings: the Annual Energy Efficiency Campaigns and Web-based Information Initiatives. The following is an overview of each.
  - Annual Energy Efficiency Campaigns
    - Customer Insights and Analysis: In 2011, SCE&G continued to proactively educate its customers and create awareness on issues related to energy efficiency and conservation. To help maximize the effectiveness of our campaigns, customer feedback was obtained to ensure marketing and communications efforts are consistent with what customers value most. Key insights gained through SCE&G's Brand Health Study and Voice of the Customer Panels were integral to ensure we are communicating in a consistent manner that customers will understand.

As a result, SCE&G continues to highlight programs/services that reflect three main categories identified by our customers as offering the best opportunity to save energy and money. These areas include: (1) rebates and incentives; (2) in-home services; and (3) education.
    - Media/Channel Preferences: Placement of all marketing and advertising is carefully considered, taking into account media preferences customers have identified as preferred methods of communicating information about SCE&G's energy efficiency programs and services. Priority channels include television (local news and select cable stations); online banner advertising, radio, electronic/print newsletters, direct mail, bill inserts and newspaper (major dailies and weekly minority publications). SCE&G's 37 statewide business office locations also serve as a distribution point for sharing information with customers. In addition, SCE&G has also incorporated social media into the picture via Twitter and Facebook.

Key South Carolina markets covered with all marketing communications include Columbia, Charleston, Aiken and Beaufort.



In 2011, 27,644,176 impressions were made through our marketing communications and advertising plan and channel mix (excluding social media).

- Public Affairs/News Media/Speakers Bureau: Furthermore, SCE&G understands the value of public affairs as an integral part of a well-rounded, energy efficiency, communication strategy and actively engages news media (broadcast and print) for coverage with key programs and services that will benefit our customers now and in the future. Public Affairs and marketing staff also provide support with securing company experts to address a variety of organizations through a formal Speakers' Bureau, extending our outreach to church groups, senior citizen and low-income housing communities, civic organizations, builder groups and homeowner associations.
- Special Events: Another key component to SCE&G's annual marketing initiatives include participation in a variety of events that offer the opportunity to further extend customer education and outreach for energy information. SCE&G's 2011 schedule included a solid mix of special events to include the HBA Home Improvement Show and Tour of Homes in Columbia, Black Expos in Columbia and Charleston and sponsorship of Columbia Metropolitan Magazine's Dream Home. The company organized an Energy Day sponsorship with the University of South Carolina and hosted live, on-air energy efficiency phone banks with WIS-TV (Columbia) and WCSC-TV (Charleston) – with SCE&G Energy Team members fielding customer calls during local evening news programming.
- EnergyWise Communications: Brand positioning of SCE&G's energy efficiency programs and services with all marketing and advertising initiatives falls under the EnergyWise umbrella – an SCE&G registered trademark in South Carolina and encompassing general awareness education as well as program specific offerings.
  - General Awareness Education: Last year's advertising included messaging on a wide range of topics such as year-round and seasonal energy efficiency tips that are practical for customers to manage on their own or that have a no-cost, low-cost factor to them. Examples include thermostat settings, checking air filters monthly, water heater settings and unplugging appliances that are sometimes perceived to be "energy vampires" (lights, TV's, computers, cell phone chargers, etc.).
  - Program Specific Offerings: In 2011, SCE&G launched several new rebate/incentive programs under its Demand Side Management (DSM) department – many of which were featured in our general awareness advertising schedule. Specific programs included ENERGY STAR Lighting, our free Home Energy Check-up, Home Performance with ENERGY STAR and Heating & Cooling and Water Heating (new equipment and efficiency tune-ups).
  - Web-Based Information and Services Programs: SCE&G's online offerings can be broken into four components: Customer Awareness Information, the Energy Analyzer, free online Energy Audit and EnergyWise e-newsletter. Altogether, there have been more than 3.88 million visits to SCE&G's website in 2011 and feedback has been positive. Customers must be registered to use the interactive tools: Energy Analyzer and Energy Audit. There

are over 299,000 customers registered for this access. Descriptions of the four categories listed above follows:

- Customer Awareness Information: The SCE&G website supports all communication efforts to promote energy savings information – both general awareness tips and program-specific profiles, tools and resources – all through a section called “Be EnergyWise and Save”. Energy savings information includes detailed information on each of the new Demand Side Management programs for residential and commercial/industrial customers, as well as how-to videos on insulation, thermostats and door and windows. Details on the latest tax credits offered by the American Recovery and Reinvestment Act of 2009 is also available, including links to help customers explore and learn how they can take advantage of these credits.
- Energy Analyzer: The Energy Analyzer, in use since 2004, is a 24-month bill analysis tool. It uses complex analytics to identify a customer’s seasonal usages and target the best ways to reduce demand. This Web-based tool allows customers to access their current and historical consumption data and compare their energy usage month-to-month and year-to-year -- noting trends, temperature impact and spikes in their consumption. There were over 100,000 visits to the Energy Analyzer tool in 2011.
- Online Energy Audit: The Online Energy Audit tool leads customers through the process of creating a complete inventory of their home’s insulation and appliance efficiency. The tool allows customers to see the energy and financial savings of upgrades before making an investment. There were 5063 customers who used the Energy Audit tool in 2011.
- SCE&G EnergyWise E-Newsletter: SCE&G’s web-based information and services included ongoing management of its EnergyWise e-newsletter to support customer demand for additional information on ways to help them save energy. A total of 3,100 customers registered for the e-newsletters in 2011.

## Energy Conservation

Energy conservation is a term that has been used interchangeably with energy efficiency. However, energy conservation has the connotation of using less energy in order to save rather than using less energy to perform the same or better function more efficiently. The following is an overview of each SCE&G energy conservation offering:

- Energy Saver / Conservation Rate: The Rate 6 (Energy Saver / Conservation) rewards homeowners and homebuilders who upgrade their existing homes or build their new homes to a high level of energy efficiency with a reduced electric rate. This reduced rate, combined with a significant reduction in energy usage, provides for considerable savings for our customers. Participation in the program is simple since the requirements are prescriptive, which is beneficial to all of our customers and trade allies. Homes built to this standard have improved comfort levels and increased re-sale value over homes built to the minimum building code standard, which is also a significant benefit to participants. Information on this program is available on our website and by brochure.

- Seasonal Rates: Many of our rates are designed with components that vary by season. Energy provided in the peak usage season is charged a premium to encourage conservation and efficient use.

## Demand Side Management Programs

On July 15, 2010, SCE&G received an Order from the Commission for approval of its portfolio of DSM programs. The portfolio included nine programs, seven targeting SCE&G's residential customer classes and two targeting SCE&G's commercial and industrial customer classes. Implementation began in 4<sup>th</sup> quarter, 2010 with the free Home Energy Check-up and select Commercial and Industrial programs – followed by a phased-in approach that continued through 2<sup>nd</sup> quarter 2011. A description of each program follows:

- Residential Home Energy Reports (previously Benchmarking) provides customers with comparisons of their monthly energy consumption with benchmarks showing average energy consumption by similarly situated energy users. The monthly benchmarking information is provided free of charge to customers who elect to participate in the program.
- Residential Energy Information Display provides customers with an in-home display that shows information from the customer's meter regarding a home's current energy use and cost, and the use and cost to date for the month. The displays are made available to customers at a discounted price. After review of the initial implementation phase, a second phase was implemented in 4<sup>th</sup> quarter to a select group of customers, with full rollout scheduled for 2<sup>nd</sup> quarter 2012.
- Residential Home Energy Check-up and Home Performance with ENERGY STAR® encourages customers to have an assessment done of the energy efficiency of their homes. It includes two tiers of home energy review and assessment.
  - Beginning in October, 2010, the Home Energy Check-up program was offered to customers. This visual checkup and "check-off" audit is performed by SCE&G staff at the customer's home. As a direct incentive for customers to participate in the program, customers are offered an energy efficiency kit containing simple measures, such as compact fluorescent light bulbs ("CFL"), water heater wraps and/or pipe insulation. The Home Energy Check-up is provided free of charge to all residential customers who elect to participate.
  - The Home Performance with ENERGY STAR® program goes a step further and provides a comprehensive audit with diagnostic testing of the energy efficiency of the home by trained contractors. SCE&G promotes these audits by independent providers and subsidizes the cost of the audit and specific measures undertaken by customers based on the audit findings.
- Residential ENERGY STAR® Lighting program provides residential customers with incentives for purchasing and installing high-efficiency and ENERGY STAR® qualified lighting.
- The Residential Heating & Cooling and Water Heating Equipment (previously New High Efficiency HVAC and Water Heater) program provides incentives for installing high efficiency HVAC units and water heaters in new and existing homes.

- The Residential Heating & Cooling Efficiency Improvements (previously named Existing HVAC Efficiency) program provides residential customers with incentives for investing in efficiency tune-ups and other improvements to their HVAC systems.
- Customers and builders willing to commit to overall high standards of energy efficiency in new construction may receive incentives under the Residential ENERGY STAR® New Homes program. This program provides incentives based on a comprehensive analysis of the energy efficiency of new homes reflecting both the construction techniques used and the appliances installed.
- Beginning in October, 2010, the Commercial and Industrial Prescriptive program began providing lighting incentives to non-residential customers to invest in high-efficiency lighting and fixtures. In the 1<sup>st</sup> quarter of 2011, SCE&G went beyond these incentives to include energy efficient measures like high efficiency motors and other equipment. To ensure simplicity, the program includes a master list of measures and incentive levels that are easily accessible to commercial and industrial customers on the website.
- Commercial and Industrial Custom program provides tailored incentives to commercial and industrial customers based on the calculated efficiency benefits of their particular energy efficiency plans or construction proposals. This program applies to technologies and applications that are more complex and customer-specific. All aspects of this program fit within the parameters of both retrofit and new construction projects.

### Load Management Programs

SCE&G's load management programs have as their primary goal the reduction of the need for additional generating capacity. There are four load management programs: Standby Generator Program, Interruptible Load Program, Real Time Pricing Rate and the Time of Use Rates. A description of each follows:

- Standby Generator Program: The Standby Generator Program for retail customers was revamped in 2009 to serve as a load management tool. General guidelines authorize SCE&G to initiate a standby generator run request when reserve margins are stressed due to a temporary reduction in system generating capability or high customer demand. Through consumption avoidance, customers who own generators release capacity back to SCE&G where it is then used to satisfy system demand. Qualifying customers (able to defer a minimum of 200 kW) receive financial credits determined initially by recording the customer's demand during a load test. Future demand credits are based on what the customer actually delivers when SCE&G requests them to run their generator(s). This program allows customers to reduce their monthly operating costs, as well as earn a return on their generating equipment investment. There is also a wholesale standby generator program that is similar to the retail programs. On March 3, 2010 the EPA published regulations restricting the operation of certain reciprocating internal combustion engines (RICE). These RICE regulations threatened to restrict our retail standby generator program so much that SCE&G considered ending the program. However in February 2011 the EPA asked for further comments on some of the restrictions and is expected to publish less restrictive regulations in 2012.
- Interruptible Load Program: SCE&G has over 150 megawatts of interruptible customer load under contract. Participating customers receive a discount on their demand charges for shedding load when SCE&G is short of capacity.

- Real Time Pricing (RTP) Rate: A number of customers receive power under our real time pricing rate. During peak usage periods throughout the year when capacity is low in the market, the RTP program sends a high price signal to participating customers which encourages conservation and load shifting. Of course during low usage periods, prices are lower.
- Time of Use Rates: Our time of use rates contain higher charges during the peak usage periods of the day and discounted charges during off-peak periods. This encourages customers to conserve energy during peak periods and to shift energy consumption to off-peak periods. All our customers have the option of a time of use rate.

## **Municipal Electric Utilities**

### **City of Abbeville:**

On Line “Energy Depot” Toolkit: Abbeville Public Utilities offers customers Energy Depot®, which is a set of online tools and resources to help them better understand and manage their home energy use and costs. Energy Depot is a free resource for energy information. They can use Energy Depot to:

- Receive a personalized energy profile with an estimate of their energy costs for each home energy system/appliance group
- Learn specific things they can do to reduce energy use and how much they can save
- Complete a do-it-yourself home energy audit and receive a report online
- Quickly estimate the annual energy use and cost of home energy systems and appliances
- Compare heating and cooling systems or water heater to a range of new systems
- Learn how soon they can pay for a new more efficient heating or cooling system or water heater through lower energy bills
- Use the Energy Library to answer energy questions
- Get answers to the most frequently asked questions regarding home energy use

Booklet (“Energy Matters in Your Home”): This guidebook is produced by APPA and is designed to give residential customers practical, energy-saving advice. Along with top tips for saving energy the booklet highlights key areas including home weatherization, heating and cooling, lighting and appliances. Energy Matters in Your Home also contains references to other resources that customers can access to obtain additional information. It is available in our lobby or mailed to customers upon request.

Eco@home Newsletter: Eco@home Newsletter is a quarterly consumer publication produced by APPA that communicates energy efficiency tips and information to customers of public power utilities. The digest-sized 12-page piece encourages readers to consume energy more efficiently-saving money and benefiting our environment. They are mailed directly to the customer.

Home Energy Review: Upon request from our customers, local staff examines both the interior and exterior of the home with the customer to look for obvious but often overlooked ways to reduce energy consumption. We take digital and thermal photos of the home then provide a written report to the customer with energy saving suggestions.

### **City of Bennettsville:**

The City of Bennettsville purchases power exclusively from a Central Electric Cooperative distribution cooperative, Marlboro Electric (MECO). We occasionally participate with MECO on local activities but we have no additional DSM activity.

*Saving Energy, Saving Money: How South Carolina’s Electric and Natural Gas Utilities Are Using Demand-Side Management to Help Customers Reduce Their Energy Bills (2011)*

### **City of Camden:**

The City of Camden Electric Department has purchased and implemented a SCADA system (Supervisory Control and Data Acquisition) to perform demand side management. The SCADA system replaces a radio based load management system and reduces peak demands through voltage reduction at their substations. With the SCADA system implemented, Camden has the ability reduce peak loading by approximately 5%.

### **Easley Combined Utilities:**

Easley Combined Utilities conducts voltage reduction during peak time to reduce electrical demand.

### **Greer Commission of Public Works:**

On our website, [www.greercpw.com](http://www.greercpw.com), we offer energy saving tips to the customers that will promote energy efficiency and conservation. We offer a set of online tools and resources that allows the customer to better understand and manage energy costs within their home or business. The link provided enables the customer to complete a do-it-yourself energy audit, the benefits of energy efficiency and how to realize savings on their utility bills by making some improvements to their homes. Contains a complete energy library to help the customer get answers to their energy questions.

We offer in-house energy audits provided by Greer CPW staff. The staff will conduct an inspection of the home and make recommendations for changes to help with energy efficiency.

We offer Time-of-Use rates to some of our commercial customers, which help to promote off-peak energy use.

We are processing a PILOT study for new meters that would have the capability of two-way communications to help with Load Management.

### **Orangeburg Department of Public Utilities:**

We offer free audits to our residential customers, commercial and industrial customers. Although our audit is limited, it does help the customer in solving issues surrounding air escape, poor insulation, and energy saving tips.

Orangeburg has a time-of-use rate offered to our customers that is designed mainly for our irrigation farm customers.

### **City of Rock Hill:**

#### **Conservation**

The City of Rock Hill (“City”) is currently involved in an Automated Metering Infrastructure (AMI) Pilot project. Over 7,000 new solid-state electric meters have been installed. As part of this project, the City is

evaluating the market and public interest for in-home displays and/or on-line customer access to load profile data and real-time data to monitor and control their power consumption & peak demands.

### **Energy Efficiency**

The City has developed its Smart Choice program to encourage energy efficiency for our residential customers. This program provides either rebates for installation of high efficiency heat-pumps & water heaters or low-interest financing. Customers participating in the Smart Choice program are also available for the City's lowest cost residential electric rate schedule. The City participates in the York County Green Business Conference, York County Earthday Birthday, and City of Rock Hill Operation Center Open House offering free CFLs, low-flow showerheads, and weather stripping, along with brochures providing energy efficiency ideas & suggestions for homes or businesses, to all interested participants.

### **Load Management**

The City operates an annual Load Management program through three defined programs:

- Load Control Devices on Residential A/C and Electric Water Heaters (2,150 units)
- Operation of Standby Generation during select periods (13 MW)
- Voltage Reduction

The City also offers our commercial & industrial customers, who can shed 100 kW or more during requested times, credits for the kW reduction. In 2011, the City was able to reduce its annual peak demand by an estimated 6.9%

### **City of Union:**

The City of Union has three (3) substations and through voltage reduction shaves peak by lowering the voltage from 124.6 volts to 118.9 volts during high demands.

### **City of Westminster:**

The City of Westminster is relatively small which accounts for the City having very little in the way of Demand-Side Management (DSM) activities. The Utilities Department of the City does offer an interruptible electric rate but currently has only one customer on this particular rate. That customer receives a billing benefit in exchange for not operating during times of load management. Our times of load management occur when our provider, PMPA, indicates the system is nearing peak electrical usage. Other than the occasional offering of tips for conservation whenever a customer should ask, the City does not have any other formal DSM activities.



## State-Owned Electric Utility

### Santee Cooper:

#### Residential Programs

- Smart Energy Existing Homes Program: Smart Energy Existing Homes are certified by a Santee Cooper Energy Advisor to meet certain energy performance guidelines. A home can receive the Smart Energy Home certificate by achieving an energy performance target or installing a specific number of eligible energy efficiency upgrades. The rebate for Smart Energy Existing Home is \$600 and is payable to the homeowner. There are additional measures that can be implemented individually or in combination with the Smart Energy Existing Home measure. There were 455 customers participating for a savings of 1481 MWh. The total incentive cost was \$241,370.

Measure	Customers	Incentive
Individual Water Heater	22	\$35.00
Smart Energy Existing Home	354	\$600.00
Individual 15 SEER Heat Pump	79	\$150.00
15 SEER Heat Pump combined with Smart Energy Existing Home	327	\$50.00

- Refrigerator Rebate Program: The Refrigerator Rebate Program offers customers rebates for the purchase and installation of ENERGY STAR® refrigerators between 10-30 cubic feet in size. It also offers customers rebates for surrendering their older, inefficient units within the same size range to be recycled by Santee Cooper's recycling contractor. These rebates are intended to reduce the customers' incremental cost of upgrading to higher efficiency appliances, as well as, get the less efficient refrigerators off the grid.

#### Rebates include:

- \$35 Rebate towards the recycling of a working pre-1993 refrigerator
- \$40 Rebate towards the purchase of a new ENERGY STAR® refrigerator
- \$75 Rebate towards the purchase of a new ENERGY STAR refrigerator plus recycling of one working refrigerator
- \$110 Rebate for purchasing a new ENERGY STAR refrigerator and recycling of two working refrigerators <sup>7</sup>

Program participation in 2011 resulted in 236 old refrigerators being recycled and 634 new ENERGY STAR refrigerators being purchased with an estimated annual energy savings of 159 MWh. Total rebates for the Refrigerator Rebate program incurred through Santee Cooper in 2011 were \$33,620.

- Smart Energy New Homes Program: The Smart Energy New Home Program began on November 1, 2009. The Smart Energy New Homes Program is comprised of two tiers of energy efficiency standards, and it offers incentives to builders to facilitate and encourage their participation. ENERGY STAR® New Home performance standards require that homes be 15% more efficient than the requirements in 2006 International Energy Efficiency Code (IECC). Smart Energy New Home performance standards require that homes be 10% more efficient than the requirements of

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<sup>7</sup> [Santee Cooper footnote]: At least one must be a pre-1993 model

2006 IEEC. The rebate for Smart Energy New Homes ENERGY STAR® is \$1,600 and the rebate for the Smart Energy New Homes is \$1,000, both of which are payable to the homebuilder. There were 29 new homes were built that qualified as Energy Star homes for a savings of 73 MWh. The incentive cost was \$46,400.

- On-site Energy Assessments: Santee Cooper offers free energy assessments to residential customers upon request.
- Low Income Weatherization Program: The Low-Income Weatherization Program incorporates a comprehensive approach to building energy retrofits; encouraging not only high efficiency equipment acquisition but also proper unit sizing, installation, operation, interaction, and reducing overall home infiltration. Many Weatherization programs focus on simple high efficiency installations only, which captures a fraction of the savings. Industry research and contractor interviews show that there are significant additional savings opportunities when comprehensively addressing the needs of low income housing.

In addition to bringing awareness to customers about home weatherization and the long-term operational savings they will experience through their high-efficiency retrofits, proper installation, and/or maintenance of the system, the purpose of the Program also is to promote market transformation through increasing customer awareness in the marketplace. There were 6 pilot projects completed in 2011. The Low Income Weatherization program will be available in 2012.

- Equipment and Lighting Incentives: Residential CFL's: CFL's can save about \$30 or more electricity costs over each bulb's lifetime. The Residential CFL's program gave out 223,652 bulbs to 18,638 customers saving 6,374 MWh. The incentive cost was \$1.45 per bulb for a total bulb cost of \$323,490.

## Commercial Programs

- Commercial Prescriptive Program: The types of measures that qualify are Lighting, HVAC, Building Envelope, and Refrigeration. There were 151 customers that participated for a savings of 4,106 MWh. These savings come from several different measures that are implemented as an individual project or in combination with other measures. The incentive cost was \$292,972.
- Commercial Custom Program: Custom rebates are tailored specifically to provide unique energy saving initiatives on a business-by-business basis. The rebate is based on \$0.10 for every kWh saved during first-year, not to exceed 50% of the qualifying measure's incremental cost. Customers will be subject to a maximum rebate of \$200,000 per facility per calendar year for the Commercial Custom Program and an overall rebate cap of \$300,000 per facility, per calendar year for participation in multiple energy efficiency programs offered by Santee Cooper. For the purposes of Santee Cooper's energy efficiency programs, a customer facility is defined as one or several adjacent buildings owned or operated by a single customer. Seven customers participated for a savings of 402 MWh. Four projects implemented Variable Frequency Drives and 3 projects implemented CO2 sensors. The incentive cost was \$20,298.
- On-site Energy Assessments: Santee Cooper offers free energy assessments to commercial customers upon request.
- Commercial CFL's: Commercial CFL's are classified as either High Use or Low Use based on the number of hours they are used in an average week. There were 17,207 High Use bulbs given to

210 customers saving 3,682 MWh and 14,122 Low Use bulbs given to 661 customers saving 664 MWh. The total incentive cost for Commercial CFL's was \$45,314.

## Load Management

- Interruptible Service Incentives: Santee Cooper does not offer any interruptible service incentives, but the GL rate is designed with an interruptible service clause.
- Time-of-Use or Seasonal Rates: Santee Cooper offers time-of-use rates for commercial and residential respectively for the following rates: GT& RT. The GV rate is a seasonal rate for commercial customers.
- Standby Generation Incentives: Santee Cooper does not offer an incentive but facilitates its availability through a standby generator lease program.
- Thermal Energy Storage: Thermal Energy Storage was discontinued in August, 2011. There were no new participants in this program in 2011. This program will be reviewed possibly in 2012.

## Public Information

- Web-Based Customer Tips & Tools: Santee Cooper offers online energy saving tips for residential and commercial customers and has a Residential Online Energy Audit. The online energy audit helps customers discover how to reduce their energy consumption and lower their utility bills.

Santee Cooper customers have two choices when completing the Online Energy Audit:

- A Full Audit to get the most detailed and accurate online analysis which takes only 20-40 minutes.
- An EZ-Audit which takes less than half the time but will make general assumptions to provide you with a full energy analysis.
- In-Home Real-Time Energy Monitoring: Santee Cooper will offer Blue-Line monitoring in 2012.
- Direct-to-customer: Santee Cooper communicates directly to customers to support all of our energy-efficiency, conservation and DSM activities and programs. Our monthly bill inserts highlight new programs and include clear, measurable calls to action. We also utilize direct mail promotions and communication and email customers through our opt-in program, with monthly information and links to sign up or have questions answered; in 2011 that opt-in program included about 200 customers, and our direct mail numbers vary according to the target audience for each. We also communicate to customers through Facebook, Twitter and YouTube; we have more than 1,000 followers on Twitter and more than 200 fans on Facebook, both areas of steady growth in 2011. We have more than 26,000 views on our YouTube videos.
- Public Campaigns: Santee Cooper is increasingly using advertising and communications vehicles that target specific customers and customer groups, moving away from the more mass-media advertising of old. We advertise and promote our programs through digital advertising on the web and through Facebook, which is highly measurable and lets us know who we are reaching and how they are responding. It also allows us to quickly adjust promotions to achieve better results with our customers and other public stakeholders. We still use press releases and press conferences,

such as in 2011 when we used the 10th anniversary of Green Power to promote Green Power sales to customers, and to highlight how Green Power revenues are reinvested in new renewable energy generation such as our Green Power Solar Station, dedicated last spring in Myrtle Beach. And we are partnering with customers who can help spread the word, such as large property managers who help us include energy efficiency promotions to their property owners.

- **School Programs & Resources:** Through educational initiatives Santee Cooper has established a strong, collaborative network with school districts in the state to provide educators and students with a real-world understanding of the power and purpose of electricity as well as the importance of conserving and using that power efficiently. Through our business and education partnerships Santee Cooper is continually supporting the needs of students, teachers and parents. The following describes the programs in place for ongoing community education and involvement in the energy efficiency and conservation aspects of Santee Cooper's operations.
  - **Energy Educators Institute:** Each summer Santee Cooper sponsors the Energy Educators Institute, a graduate level course for certified South Carolina K-12 teachers and administrators. Ninety educators explore the scientific concepts of energy, its sources, use and impact on the environment, economy and society. Since 1988 over 1,700 South Carolina educators have attended the Institute and have received relevant curriculum based materials to enhance their teaching in areas such as energy efficiency and conservation.
  - **Educational Publications:** Approximately 25,000 curriculum-based environmental/energy conservation publications (K-12) are sent to teachers in the state each year. These publications educate teachers and students about environmental issues such as the importance of Reduce, Reuse, and Recycle, how renewable resources can play a part in the generation of power as well as the need to develop life-long practices to conserve energy wisely.
  - **Solar Schools' Project/Conservation of Energy Curriculum:** Santee Cooper's Solar Schools Initiative in 2007 lead to the development of the Conservation of Energy science curriculum kit now being taught to all sixth grade students in 20 middle schools in South Carolina. Teachers are trained each summer (90 to date) on the Conservation of Energy curriculum equipping them with the scientific knowledge needed to understand the opportunities and limitations associated with renewable power sources as well as the need for societies to develop life styles that embrace the efficient use of energy.
  - **E-SMART Kids:** This interactive website is a tool to inspire teachers, students and parents to be "green." The intent of the website is to bring awareness and understanding about the need to be energy efficient and the steps each individual can take to prevent energy waste. Also available on this site is a link for teachers and parents to learn how Santee Cooper's "green initiatives" can help make homes, schools and businesses operate in a more energy efficient manner.
  - **Environmental Bookmarks:** Santee Cooper's energy conservation message is also delivered through the distribution of bookmarks, Live the Good Life and Make an Impact, (over 25,000 in 2011) at educational and community venues, such as career day events, classroom presentations and environmental fairs. The "green" tips shared on the bookmarks are a daily reminder to students, parents and community members on the actions they can take every day to use energy more wisely.



## **South Carolina Natural Gas Utilities—Summary**

Of the 15 natural gas utilities in South Carolina, 8 had ongoing DSM activity in 2011. These utilities together represented 91% of retail natural gas sales by natural gas distribution utilities in 2010.<sup>8</sup>

In summary, their ongoing DSM activity consisted of—

### Energy Efficiency:

- One natural gas utility provided payments builders to promote energy efficient new construction.
- Two natural gas utilities offered on-site energy assessments to customers, providing trained personnel to evaluate facilities and suggest methods for improving energy efficiency.
- One natural gas utility implemented an energy efficiency and weatherization program targeting low-income customers, providing personalized assessments and home improvements to enable these customers to lower their monthly natural gas bill.
- Five natural gas utilities offered financial incentives (such as rebates or discounts) for the purchase and/or installation of newer, more efficient natural gas appliances or equipment.

### Load Management:

- Two natural gas utilities offered financial incentives (such as bill credits or lower rates) to customers that volunteered to allow utilities to cut off or reduce their natural gas deliveries during periods of peak demand. (Interruptible customers are typically commercial or industrial entities that have the ability to instantaneously switch from utility natural gas to another energy source or are willing to suspend operations during fuel curtailment periods.)

### Public Information:

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<sup>8</sup> Source: United States Energy Information Administration, EIA-176 (2010)  
<http://www.eia.gov/cfapps/nggs/nggs.cfm>

- Three natural gas utilities maintained websites that offered energy efficiency and conservation tips and/or web-based tools for viewing and analyzing monthly natural gas usage and cost.
- Two natural gas utilities communicated directly with customers through mailings and/or in-person assistance to publicize utility DSM programs and offer energy efficiency and conservation tips and services.
- One natural gas utility conducted public outreach campaigns through advertising and presence at community events to publicize utility DSM programs and offer energy efficiency and conservation tips.

Natural gas utilities reported the following ongoing DSM activity in 2011:

**South Carolina Natural Gas Utilities: Summary of Demand-Side Management (2011)**

Natural Gas Utility Name	Ownership	Energy Efficiency				Load Management	Public Information		
		New Building Efficiency Incentives	On-Site Energy Assessments	Low-Income Efficiency and Weatherization Assistance	Efficient Appliance or Equipment Incentives	Interruptible Service Incentives	Web-Based Customer Tools and Tips	Direct-to-Customer Communication	Public Campaigns
Bamberg Board of Public Works	Municipal								
City of Bennettsville	Municipal								
Chester County Natural Gas Authority	Municipal				✓				
Clinton-Newberry Natural Gas Authority	Municipal				✓				
Fort Hill Natural Gas Authority	Municipal				✓	✓			
Fountain Inn Natural Gas	Municipal								
Greenwood Commission of Public Works	Municipal								
Greer Commission of Public Works	Municipal		✓				✓		
Laurens Commission of Public Works	Municipal								
Orangeburg Department of Public Utilities	Municipal				✓	✓			
Piedmont Natural Gas Company	Investor-Owned			✓	✓			✓	
South Carolina Electric & Gas Company	Investor-Owned	✓	✓				✓	✓	✓
City of Union	Municipal								
Town of Winnsboro	Municipal								
York County Natural Gas Authority	Municipal						✓		

Source: South Carolina Energy Office, annual survey of utilities.



Natural gas utilities submitted narrative descriptions of their 2011 DSM activity in response to SCEO requests for information. These descriptions are as follows. (The following descriptions are presented as submitted by each utility, with the exception of minor edits performed to ensure relevance to the scope of this report and consistency with its format):

### **Chester County Natural Gas Authority:**

Demand-Side Management is a tool, used especially by electric utilities, to reduce peak loads, which will also postpone the large investment of new facilities to meet that peak load. Demand-Side Management for natural gas utilities is based on the increased efficiency of new natural gas appliances which reduces demand on the gas system. Natural gas systems have peak loads, but they are more manageable with smaller investments in infrastructure.

The Chester County Natural Gas Authority version of Demand-Side Programs includes:

- **Appliance Program:** Allow customer to purchase discounted natural gas appliances from Chester County Natural Gas Authority. (New Appliances are much more efficient than older appliances.). This is both savings for the customer and Demand-Side management for Chester County Natural Gas because of the reduction in gas consumption.
- **Natural Gas Tankless Water heater:** Sell Natural Gas Tankless Water heater to customers, which is more efficient than gas tank water heaters, with \$300 rebate. Savings = \$50.00 per year versus natural gas tank water heater. This is both savings for the customer and Demand-Side Management for Chester County Natural Gas because of the reduction in gas consumption.

### **Clinton-Newberry Natural Gas Authority:**

Clinton-Newberry Natural Gas Authority (CNNGA) is promoting energy efficient natural gas tankless water heaters to all of the customers served by CNNGA by issuing a rebate of \$100 to replace a regular tanked natural gas water heater or any electric water heater. In 2011 CNNGA replaced 170 tanked natural gas water heaters and electric water heaters. The energy consumed by the energy efficient natural gas tankless water heater is about half the energy consumed by a standard tank natural gas water heater.

### **Fort Hill Natural Gas Authority:**

Our demand-side management activities for 2011 included the following:

- Preferred rates for interruptible natural gas customers
- Rebates for customers switching to certain new natural gas appliances

### **Greer Commission of Public Works:**

[Note: Greer Commission of Public Works (CPW) submitted a description of DSM programs implemented in 2011. This description is included in the “Electric Utilities” section of this report. While Greer CPW’s DSM programs did not specifically target natural gas usage, some of their programs—particularly energy audits and public information activities—had the effect of encouraging natural gas efficiency, conservation, and/or reduction of peak natural gas demand.]

*Saving Energy, Saving Money: How South Carolina’s Electric and Natural Gas Utilities Are Using Demand-Side Management to Help Customers Reduce Their Energy Bills (2011)*

## **Orangeburg Department of Public Utilities:**

The Orangeburg Department of Public Utilities (ODPU) has a rebate program that includes rebates for tankless water heaters and high efficiency furnaces. The ODPU offers favorable rates for interruptible customers.

## **Piedmont Natural Gas Company:**

Piedmont Natural Gas (“Piedmont”) administers the following Energy Efficiency programs to customers in our South Carolina service territory:

- Customer Education Program - a targeted marketing approach within Piedmont’s South Carolina service territory to provide customer energy education, efficiency and conservation messages.
- Low-Income Energy Efficiency Program - provides energy efficiency measures and weatherization assistance to existing low-income residential customers,
- High-Efficiency Equipment Rebate Program – provides rebates to Piedmont's residential and commercial customers who purchase and install qualifying high-efficiency natural gas equipment to replace existing natural gas equipment.

### **Customer Education Program**

This program funds a communications campaign focusing on customer energy education, efficiency and conservation messages. Piedmont communicates these messages to customers through various means such as bill inserts, other print advertisements, and/or other available media. Piedmont also encourages customers to take advantage of potential tax credits and other incentives available for installing high-efficiency natural gas equipment, such as for water heating and space heating. Some of the energy efficiency themes used in this campaign are based on the following:

- How saving energy also saves customers money
- How to save energy through equipment and system high-efficiency upgrades
- Education on what makes high-efficiency natural gas equipment more efficient
- Energy saving tips and simple steps for residential customers to save energy at home
- How to save energy through behavioral changes

### **Residential Low-Income Energy Efficiency Program**

The primary purpose of this program is to provide energy efficiency measures and weatherization assistance, through a third-party, to low-income residential customers in Piedmont’s service territory. The program helps to create a more energy efficient and comfortable home environment for the customers

served. In addition to the actual energy savings, there can be additional benefits to the low-income customer including improved health and safety conditions, and increased comfort for residents.

The target population for this program is low-income customers dwelling in single-family homes that are served under Piedmont’s residential rate schedules. Where applicable, priority is placed on providing assistance to those eligible elderly individuals with disabilities and/or eligible families with children. There is no direct charge to the participating low-income customers for the services provided. Program funds are primarily used to pay a third-party energy organization to administer the program.

The primary energy efficiency measures provided to each program participant are based on a comprehensive in-home energy audit. The measures offered and performed to each program participant may include:

- Sealing major air leaks in floors and ceilings (penetrations, bypasses, chases)
- Insulating attic, side wall, and/or floors
- Sealing and insulating ducts
- Installing programmable/setback thermostat
- Evaluating, cleaning and tuning heating systems
- Installing general heat waste measures (furnace filters, water heater insulation wrap, piping insulation, water-saving devices, and weather-stripping)

### High Efficiency Equipment Rebate Program

This program provides rebates to Piedmont’s residential and commercial customers who purchase and install qualifying high efficiency natural gas equipment. The residential rebates are limited to high efficiency water and space heating equipment only, since water heating and space heating constitutes a large portion of residential energy usage. Commercial customers are offered a rebate to purchase and install a high efficiency water heater. This program enables customers to help offset some of the higher cost of choosing a more efficient piece of equipment. An upgrade to a higher efficiency water heater or furnace, given consistent usage patterns, can help the program participant achieve recognizable energy savings.

The following summarizes the equipment rebates that are offered and the corresponding equipment efficiency requirements.

Residential Equipment Rebate Summary

	Rebate Amount	Minimum Required Efficiency <sup>9</sup>
Natural Gas Storage Tank Water Heater	\$ 50	EF = 0.62 (or greater)
Natural Gas Tankless Water Heater	\$ 250	EF = 0.82 (or greater)

<sup>9</sup> [Piedmont Natural Gas Company note:] EF is the Energy Factor; AFUE is the Annual Fuel Utilization Efficiency

*Saving Energy, Saving Money: How South Carolina’s Electric and Natural Gas Utilities Are Using Demand-Side Management to Help Customers Reduce Their Energy Bills (2011)*

Natural Gas Forced Air Furnace	\$ 300	AFUE = 90% (or greater)
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**Commercial Equipment Rebate Summary**

	Rebate Amount	Minimum Required Efficiency <sup>10</sup>
Natural Gas Tankless Water Heater	\$ 250	EF = 0.82 (or greater)

Each customer is required to submit a rebate application, along with proof of purchase and installation of the qualifying equipment. Upon approval of the application, the rebate is mailed as a check to the customer. In addition to the rebate check, each customer that installed qualified equipment under the program receives an energy efficiency kit that includes items to help the customer further reduce their natural gas energy usage.

**South Carolina Electric & Gas Company (SCE&G):**

[Note: SCE&G submitted a description of DSM programs implemented in 2011. This description is included in the “Electric Utilities” section of this report. While SCE&G’s DSM programs did not specifically target natural gas usage, many of their programs—particularly efficient new home incentives, energy assessments, and public information activities—had the effect of encouraging natural gas efficiency, conservation, and/or reduction of peak demand within their combined gas-electric service area.]

**York County Natural Gas:**

The following link directs to our residential appliance rebate program ([www.getgassc.com](http://www.getgassc.com)). This is a secondary website we maintain to educate our residential customers on energy efficiency and conservation.

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<sup>10</sup> [Piedmont Natural Gas Company note:] EF is the Energy Factor

## **Appendix A: South Carolina State Statute Authorizing DSM Report**

### **South Carolina Code of Laws, Section 58-37-30:**

Reports on demand-side activities of gas and electric utilities; forms.

(A) The South Carolina Public Service Commission must report annually to the General Assembly on available data regarding the past, on-going, and projected status of demand-side activities and purchase of power from qualifying facilities, as defined in the Public Utilities Regulatory Policies Act of 1978, by electrical utilities and public utilities providing gas services subject to the jurisdiction of the Public Service Commission.

(B) Electric Cooperatives providing resale or retail services, municipally-owned electric utilities, and the South Carolina Public Service Authority shall report annually to the State Energy Office on available data regarding the past, on-going, and projected status of demand-side activities and purchase of power from qualifying facilities. For electric cooperatives, submission to the State Energy Office of a report on demand-side activities in a format complying with the current Rural Electrification Administration regulations constitutes compliance with this subsection. An electric cooperative providing resale services may submit a report in conjunction with and on behalf of any electric cooperative which purchases electric power and energy from it. The State Energy Office must compile and submit this information annually to the General Assembly.

(C) The State Energy Office may provide forms for the reports required by this section to the Public Service Commission and to electric cooperatives, municipally-owned electric utilities, and the South Carolina Public Service Authority. The office shall strive to minimize differing formats for reports, taking into account the reporting requirements of other state and federal agencies. For electrical utilities and public utilities providing gas services subject to the jurisdiction of the commission, the reporting form must be in a format acceptable to the commission.

## Appendix B: PURPA Qualifying Facilities

The Public Utilities Regulatory Policies Act of 1978 (PURPA) enables end users who generate power for their facilities to make any excess power available to the electric utilities supplying those users. PURPA also allows private companies to generate and to supply electricity to utilities if that power is generated using approved energy resources. “Qualifying facilities”, as defined by PURPA, include both 1) small power production facilities using renewable fuel sources, such as wind, solar, hydroelectric, biomass, waste, or geothermal; and 2) cogeneration facilities that produce both electricity and thermal energy in a way that is more efficient than the separate production of both forms of energy. Utility companies are required to purchase power from qualifying facilities at a price equivalent to the avoided cost of additional generation. The purchase of electricity from qualifying facilities and other customer-owned generation helps utilities to offset growth in overall and peak demand.

Qualifying facilities are classified into two categories: 1) purchase, meaning that utilities purchase the power generated; and 2) displace, meaning that the power is used by the facility itself, displacing power that would otherwise be drawn from the electrical grid. As shown in Table 3 below, qualifying facilities in South Carolina had the capacity to provide 156,320 kW of power as of February 2011.

**PURPA Qualifying Facilities, February 2011**

Utility	Plant Owner / Name	Location	Fuel Type	Capacity (kW)	Purchase/ Displace
Progress Energy Carolinas	Smurfit-Stone Container	Florence	Wood/Coal	25,000	PURCHASE
Duke Energy Carolinas	Aquenergy / Piedmont	Piedmont	Hydro	1,050	PURCHASE
Duke Energy Carolinas	Aquenergy / Ware Shoals	Ware Shoals	Hydro	6,300	PURCHASE
Duke Energy Carolinas	BMW Mfg Corp.	Greer	Landfill Gas	10,000	DISPLACE
Duke Energy Carolinas	Cherokee County Cogeneration / Gaffney	Gaffney	Natural Gas	100,000	PURCHASE
Duke Energy Carolinas	Converse Energy / Clifton 3	Clifton	Hydro	1,250	PURCHASE
Duke Energy Carolinas	Northbrook Carolina Hydro, L.L.C. / Boyd's Mill	Ware Shoals	Hydro	1,500	PURCHASE
Duke Energy Carolinas	Northbrook Carolina Hydro, L.L.C. / Holliday's Bridge	Belton	Hydro	3,500	PURCHASE
Duke Energy Carolinas	Northbrook Carolina Hydro, L.L.C. / Saluda	Greenville	Hydro	2,400	PURCHASE
Duke Energy Carolinas	Pelzer Hydro Co. / Upper Pelzer	Pelzer	Hydro	2,020	PURCHASE
Duke Energy Carolinas	Pelzer Hydro Co. / Lower Pelzer	Williamston	Hydro	3,300	PURCHASE
<b>TOTAL</b>				<b>156,320</b>	

## Appendix C: S.C. Electric and Natural Gas Utility Market Share<sup>11</sup>

Figure 1. South Carolina Electric Utility Market Share (by # Customers), 2010

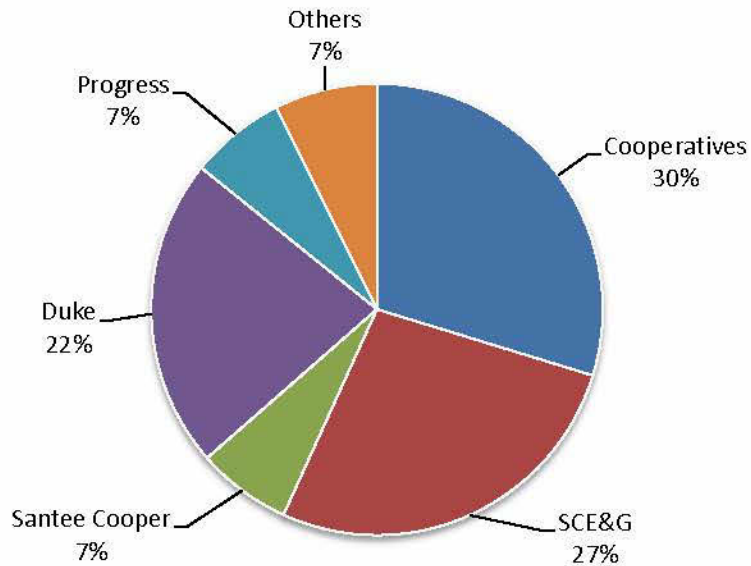
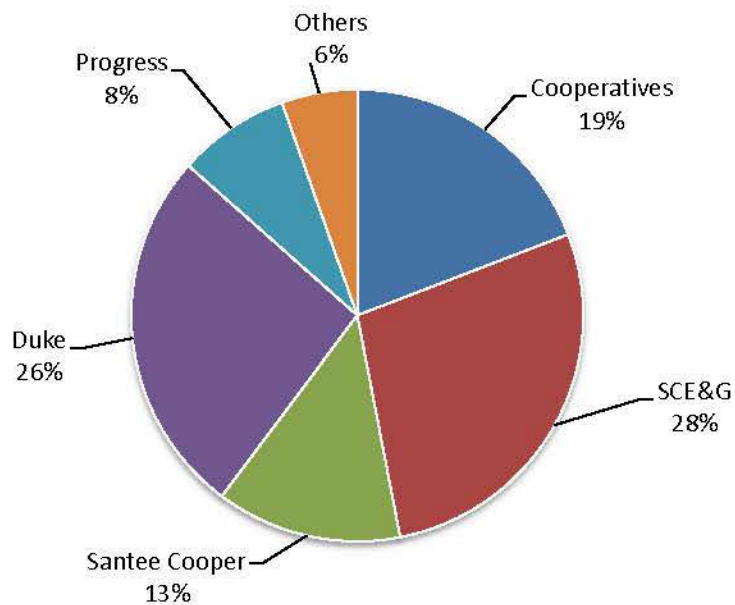


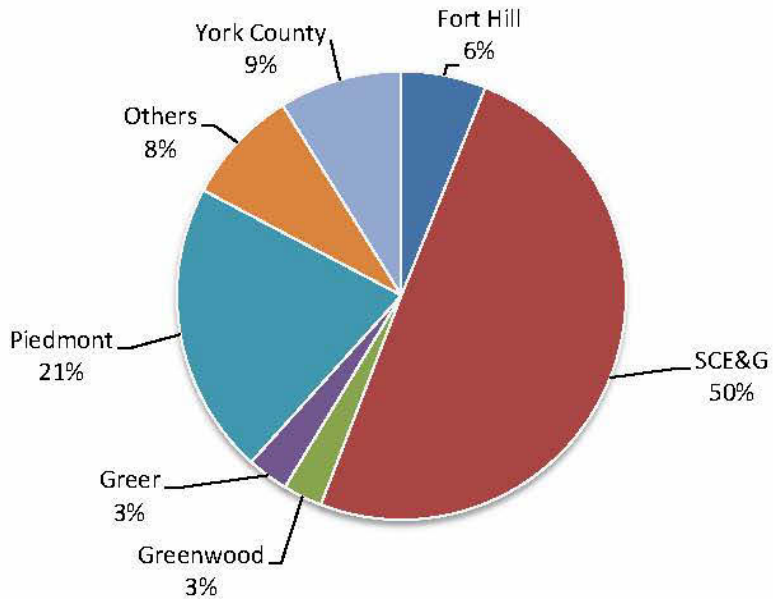
Figure 2. South Carolina Electric Utility Market Share (by kWh Sales), 2010



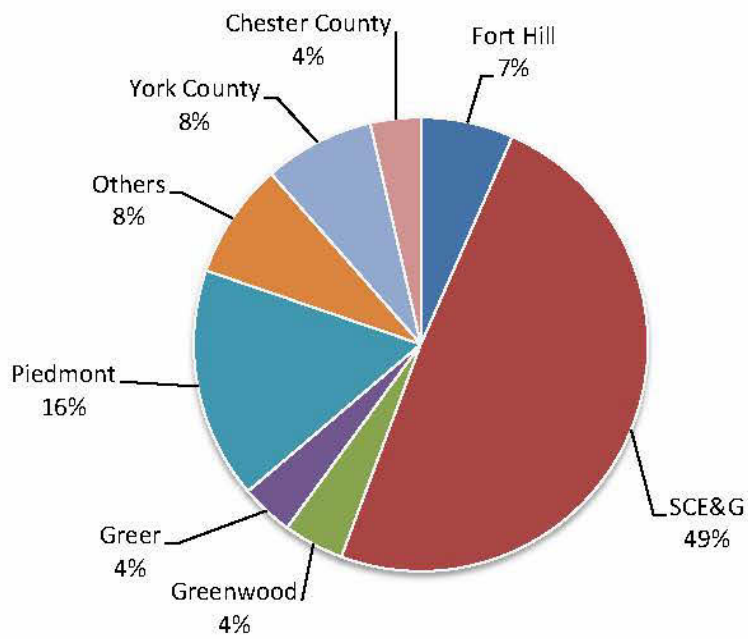
<sup>11</sup> Sources: U.S. Energy Information Administration, Forms EIA-861 and EIA-176 (2010)



**Figure 3. South Carolina Natural Gas Utility Market Share (by # Customers), 2010**



**Figure 4. South Carolina Natural Gas Utility Market Share (by CF Sales), 2010**



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