*CONFIDENTIAL*


# *South Carolina Public Service Authority*

# *Integrated Resource Plan 2008*

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# Introduction

The South Carolina Public Service Authority ("Santee Cooper") is a body corporate and politic of the State of South Carolina. Santee Cooper operates a vertically integrated electric utility system, including facilities for generation, transmission, and distribution of electric power and energy.

Santee Cooper is one of the nation's largest municipal wholesale utilities, whose System serves directly or indirectly over one-third of the State's population. Santee Cooper serves directly and indirectly some of the most rapidly developing areas of the State, including growing suburban areas outside Charleston, Columbia, Greenville and Spartanburg as well as the coastal areas of Myrtle Beach and the Grand Strand, Hilton Head Island, Kiawah Island and Seabrook Island.

Santee Cooper's direct customers currently include 31 large industrial customers, Central Electric Power Cooperative Inc. ("Central"), and two municipal electric systems, the City of Georgetown and the City of Bamberg. Santee Cooper also serves directly approximately 162,000 residential, commercial and small industrial retail customers in parts of Berkeley, Georgetown and Horry counties. Central is an association of 15 electric distribution cooperatives and Saluda River Electric Cooperative, Inc. ("Saluda"). Saluda is an association of five electric distribution cooperatives. Central serves primarily residential, commercial and small industrial customers in all 46 counties of the State. Through Central, Saluda and the two municipal electric systems, approximately 685,000 customers are served indirectly by Santee Cooper.

On a regular basis, Santee Cooper analyzes the existing and future demand and energy needs of its customers in order to ensure it has a plan that will serve its customers in an economical and reliable manner. In an effort to meet its goal of providing customers with reliable and economical energy, Santee Cooper periodically assesses its future generating resource needs. A combination of various drivers, including changes in load growth, fuel prices, construction costs, construction lead times, and the prospect of environmental

legislation have created the need to re-evaluate and update Santee Cooper's generation expansion plan. This document, Santee Cooper's Summary of the 2008 Generation Resource Plan, describes the methods, assumptions, and analysis employed by Santee Cooper to develop an updated generation expansion plan, as well as the recommendations flowing there from.

This Integrated Resource Plan ("IRP") contains the demand and energy forecast for a fifteen-year period, as well as a program for meeting the requirements shown in the forecast. This report also includes a description of demand-side management programs as required by SC Code Section 58-37-10, -30 and – 40.

# I. Load Forecast

## *Overview*

The load forecast is updated on an annual basis and consists of projections of monthly energy and peak demand requirements for a twenty year forecast horizon. Santee Cooper retains GDS Associates, Inc. to update and validate the forecasting models, develop an economic outlook, and prepare the energy and peak demand forecasts. The forecast is based on an analysis of historical events and assumptions regarding the future. These assumptions relate to key factors known to influence energy consumption and peak demand (e.g., economic activity, housing characteristics, electricity prices, weather conditions, and local area demographics).

For energy, the weather-sensitive portion of the forecast (residential and commercial classifications) is developed using econometric models. The non-weather sensitive industrial energy forecast is developed based on historical trends and information provided by individual industrial customers.

Peak demand projections are developed by sector. Econometrics is used to project peak demand for the Distribution, Central, Saluda River, and Municipal sectors. Industrial customer demand is forecast based on contract demand.

In the 2007 load forecast, forecasted energy and peak demand projections are reduced to take into account potential savings from future energy efficiency and conservation programs.

The "base case" load forecast is based on expected economic activity and normal weather conditions which are based on the most recent twenty-year averages. In addition to the base case load forecast, high and low-range projections of energy and peak demand requirements are developed to address uncertainties regarding the future.

The forecast referenced herein is Santee Cooper's 2007 Load Forecast adjusted to reflect savings from new energy efficiency programs (LF0701ADJ) for Calendar Years 2007 – 2026.

## Process

*1) Data Collection*

The load forecast database is updated each year to include the most recent historical data. Database elements include: electric system data (number of customers, kWh sales, and revenues by customer class), economic and demographic data, market characteristics, housing characteristics, and weather data.

*2) Economic Outlook*

An economic outlook is prepared each year to address recent trends in economic activity and to develop growth trends for key economic and demographic factors, including: population, number of households, employment, personal income, retail sales, gross state product, and inflation. Economic outlooks are prepared for three areas: the Santee Cooper service area (Horry and Georgetown counties, and a portion of Berkeley County), the Central service area (primarily the state of South Carolina excluding counties in the northwest area), and the Saluda service area (northwest counties of the state). Historical values are based on data provided by the U.S. Census Bureau, the Department of Labor, and the Bureau of Economic Analysis. Projected values are based on information obtained from Woods & Poole Economics, Economy.com, and the University of South Carolina (Division of Research, Moore School of Business).

*3) Forecast Development*

The Santee Cooper load forecast represents a territorial load covering portions throughout the state of South Carolina and is comprised of the projections developed for the Distribution, Industrial, Central, Saluda River, and Municipal sectors. Forecasts are prepared for each sector and are aggregated to produce the combined Santee Cooper territorial load forecast.

*3.1 Distribution*

Distribution requirements include energy sales, peak demand, and distribution losses for the residential, commercial and small industrial classifications. The number of residential customers is based on a regression

model that incorporates number of households as the independent variable. The number of commercial and small industrial customers is based on a regression model that incorporates employment as the independent variable. A statistically adjusted end-use model is used to project average energy use per residential customer.[1] The model quantifies the impacts of real household income, price of electricity, household size, housing characteristics, market share of major electric end-uses, appliance efficiencies, and weather conditions. Energy sales are computed as the product of number of customers and average energy use per customer.

An econometric model is used to project average commercial and small industrial energy use per customer. Average annual use per customer is assumed to continue its flat annual trend into the future; therefore, the model includes only heating and cooling degree days to quantify the impacts of weather conditions across each month. Energy sales are computed as the product of number of customers and average energy use per customer.

Projections of peak demand are developed at the aggregate sector level by season (summer and winter). Econometric models are used to project peak demand as a function of weather normalized energy sales and average daily temperature the summer or winter peak day.

### *3.2 Industrial*

Projections of industrial energy sales and peak demand are developed individually for each customer. Projections are based on historical trends and information regarding future plans collected from the individual industrial customers.

[1] Statistically adjusted end-use ("SAE") models incorporate the strengths of traditional econometric and end-use models.

## 3.3 *Central Requirements*

Central requirements include energy sales, peak demand, and distribution losses for the residential, commercial, and industrial classifications. The number of residential customers is based on a regression model that incorporates number of households as the independent variable. The number of commercial customers is based on a regression model that incorporates employment as the independent variable.

A statistically adjusted end-use model is used to project average energy use per residential customer. The model quantifies the impacts of real household income, price of electricity, household size, housing characteristics, market share of major electric end-uses, appliance efficiencies, and weather conditions. Residential energy sales are computed as the product of number of customers and average energy use per customer.

An econometric model is used to project average commercial energy use per customer. The model includes real retail sales, employment and heating and cooling degree days as independent variables. Total commercial energy sales are computed as the product of number of customers and average energy use per customer.

Projections of peak demand are developed at the aggregate sector level by season (summer and winter). Econometric models are used to project peak demand as a function of weather normalized energy sales and average daily temperature the summer or winter peak day.

### 3.4 *Saluda Requirements*

Saluda River requirements include energy sales, peak demand, and distribution losses for the residential, commercial, and industrial classifications. The number of residential customers is based on a regression model that incorporates number of households as the independent variable. The number of commercial customers is based on a regression model that incorporates employment as the independent variable.

An econometric model is used to project average residential energy use per customer. The model includes real household income, heating degree days, and cooling degree days as independent variables. Energy sales are computed as the product of number of customers and average energy use per customer.

An econometric model is used to project average commercial energy use per customer. The model includes real retail sales, employment and heating and cooling degree days as independent variables. Total class energy sales are computed as the product of number of customers and average energy use per customer.

Projections of peak demand are developed at the aggregate sector level by season (summer and winter). Econometric models are used to project peak demand as a function of weather normalized energy sales and average daily temperature the summer or winter peak day.

### 3.5 *Municipal*

The number of municipal customers is assumed at 2 throughout the forecast period. The number of customers served by the individual cities is not projected. An econometric model is used to project total energy sales for the

municipal sector. The model includes real total personal income, heating degree days, and cooling degree days as independent variables.

Projections of peak demand are developed at the aggregate sector level by season (summer and winter). Econometric models are used to project peak demand as a function of weather normalized energy sales and average daily temperature the summer or winter peak day.

### *3.6 Total Territorial Requirements*

Total territorial requirements include the combined energy and peak demand requirements for the five sectors. The peak demand projections represent the highest simultaneous 60-minute load for the combined five sectors.

A simulation process was developed to produce probabilistic energy and peak demand forecasts. Model inputs include probability distributions of total personal income, heating and cooling degree days, and peak day average temperatures. Outputs for each year of the forecast period include energy and peak demand distributions including projections from the 0% to 100% probability levels in increments of 5 percent. The high and low range forecasts are represented by the 95% and 5% probability levels. Results of the simulation analysis provide peak demand estimates for given temperatures and the probabilities that peak demand will rise or fall to specific levels around the base case forecast.

Below is a table of LF0701ADJ, including forecasted demand and energy (see Table 1) and a table with historical energy and demand (see Table 2).

**Table 1**
**2007 LOAD FORECAST ADJUSTED [1]**

| | Summer Peak (MW) | Winter Peak (MW) | Energy Sales (GWH) |
|---|---|---|---|
| **2008** | 5,430 | 5,649 | 28,982 |
| **2009** | 5,616 | 5,850 | 29,776 |
| **2010** | 5,820 | 6,074 | 30,679 |
| **2011** | 5,931 | 6,189 | 31,130 |
| **2012** | 6,041 | 6,302 | 31,574 |
| **2013** | 6,161 | 6,426 | 32,062 |
| **2014** | 6,282 | 6,552 | 32,559 |
| **2015** | 6,404 | 6,678 | 33,061 |
| **2016** | 6,521 | 6,800 | 33,541 |
| **2017** | 6,645 | 6,928 | 34,049 |
| **2018** | 6,778 | 7,072 | 34,647 |
| **2019** | 6,913 | 7,216 | 35,249 |
| **2020** | 7,045 | 7,358 | 35,840 |
| **2021** | 7,184 | 7,507 | 36,461 |

(1) Includes load served by Saluda River resources and excludes all off-system sales.

**Table 2**
**Historical Sales and System Peak Loads**

| Year | Sales (GWH) | System Peak Load [1] (MW) |
|---|---|---|
| 2007 | 27,221 | 5,563 |
| 2006 | 25,422 | 5,195 |
| 2005 | 25,064 | 5,371 |
| 2004 | 24,451 | 5,088 |
| 2003 | 24,060 | 5,373 |
| 2002 | 24,121 | 4,795 |
| 2001 | 22,400 | 4,803 |
| 2000 | 22,139 | 3,876 |
| 1999 | 20,286 | 3,729 |
| 1998 | 19,466 | 3,523 |
| 1997 | 18,437 | 3,336 |
| 1996 | 17,548 | 3,441 |
| 1995 | 16,022 | 3,102 |

(1) Excludes all off-system sales to other utilities

# II. Existing Resources

Santee Cooper's total summer peak generating capacity as of January 1, 2008 was 5,089 MW (see Table 3). In addition, Santee Cooper receives 84 MW of firm supply from the U.S. Army Corps of Engineers ("Corps"), 327 MW of firm hydroelectric power from the Southeastern Power Administration ("SEPA"), and use of capacity associated with the ownership interest by Saluda River Electric Cooperative, Inc. ("Saluda River") in the Catawba Nuclear Plant (which is no longer available after September 30, 2008). In August 2006, Santee Cooper entered into a lease agreement with the county of Greenwood, South Carolina for the Buzzard Roost hydro electric generating facility for an additional 15 MW of peak capability.

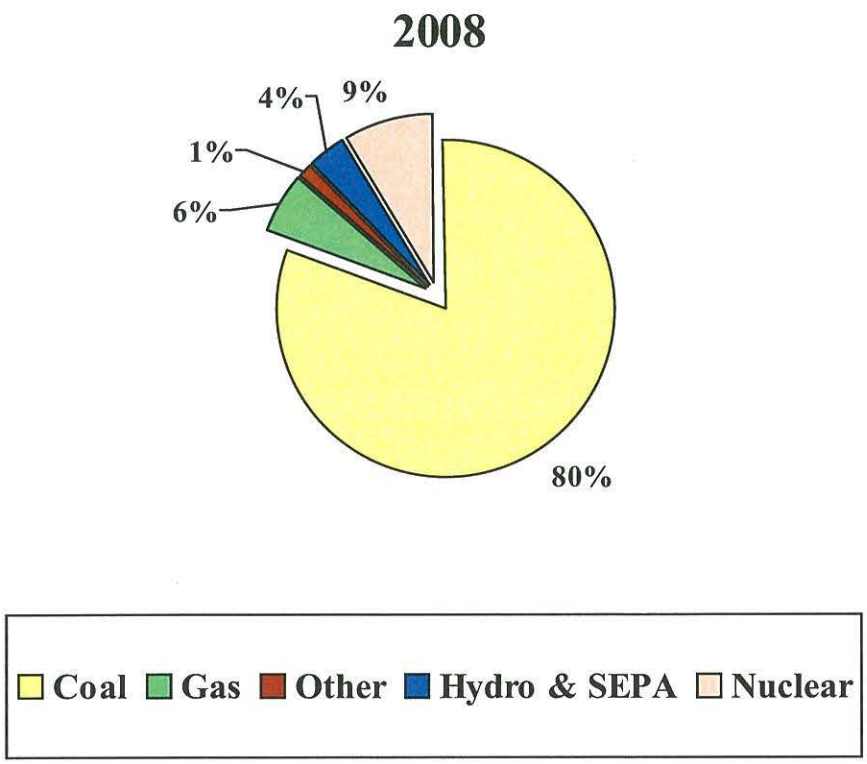
**Table 3**
**Santee Cooper owned generating facilities as of January, 2008**

| Generating Facility | Units | Location | Summer Capacity | Winter Capacity | Fuel | Began Commercial Operation |
|---|---|---|---|---|---|---|
| Jefferies Hydroelectric | 1, 2, 3, 4, 6 | Moncks Corner | 128 | 128 | Hydro | 1942 |
| Wilson Dam | | Lake Marion | 2 | 2 | Hydro | 1950 |
| Jefferies | 1 and 2 | Moncks Corner | 92 | 92 | Oil | 1954 |
| | 3 and 4 | | 306 | 306 | Coal | 1970 |
| Grainger | 1 and 2 | Conway | 170 | 170 | Coal | 1966 |
| Myrtle Beach Combustion Turbines | 1 and 2 | Myrtle Beach | 20 | 22 | Oil/Gas | 1962 |
| | 3 and 4 | | 40 | 50 | Oil | 1972 |
| | 5 | | 30 | 35 | Oil | 1976 |
| Hilton Head Combustion Turbines | 1 | Hilton Head Island | 20 | 25 | Oil | 1973 |
| | 2 | | 20 | 25 | Oil | 1974 |
| | 3 | | 57 | 70 | Oil | 1979 |
| Winyah Station | 1 | Georgetown | 295 | 295 | Coal | 1975 |
| | 2 | | 295 | 295 | Coal | 1977 |
| | 3 | | 295 | 295 | Coal | 1980 |
| | 4 | | 270 | 270 | Coal | 1981 |
| V.C. Summer Nuclear Station[1] | | Jenkinsville | 318 | 318 | Nuclear | 1983 |
| Cross Station | 1 | Cross | 620 | 620 | Coal | 1995 |
| | 2 | | 540 | 540 | Coal | 1983 |
| | 3 | | 580 | 580 | Coal | 2007 |
| Horry County Landfill Gas Station | | Conway | 3 | 3 | Landfill methane gas | 2001 |
| Lee County Landfill Gas Station | | Bishopville | 5 | 5 | Landfill methane gas | 2005 |
| Richland County Landfill Gas Station | | Elgin | 5 | 5 | Landfill methane gas | 2006 |
| Rainey Station | Combined Cycle | Starr | 447 | 508 | Gas | 2002 |
| | CT 2A | | 146 | 168 | Gas | 2002 |
| | CT 2B | | 146 | 168 | Gas | 2002 |
| | CT 3 | | 74 | 85 | Gas | 2004 |
| | CT 4 | | 74 | 85 | Gas | 2004 |
| | CT 5 | | 74 | 85 | Gas | 2004 |
| Diesel Units | | Various | 17 | 17 | Oil | Purchased in 2003 |
| **Total Capacity** | | | **5,089** | **5,267** | | |

(1) Santee Cooper's one-third ownership share. The operating license was extended to August 6, 2042 on April 23, 2004.

In 2008, it is forecasted that Santee Cooper's total energy needs will be met primarily by coal at 80% (see Figure 1). Nuclear energy, excluding Saluda River's ownership interest in the Catawba Nuclear Plant, is projected to supply 9% of the total energy needs, while natural gas is projected to supply 6%.

**Figure 1**
**Projected Total Energy Supply**



# III. Projections of Load, Capacity and Reserves

Santee Cooper ensures that its customer demand and energy requirements are met through the use of Santee Cooper generation facilities as well as purchased power contracts. In addition, Santee Cooper ensures there is available capacity over and above that amount necessary to meet the load requirements. This reserve capacity is used to cover unexpected events, such as unit outages, adverse weather conditions, unexpected demand, or an unplanned loss in the transmission system. Currently, Santee Cooper uses planning reserve targets of 10% and 13%, respectively, for the winter and summer months.

In planning for future reserve needs, the load forecast's firm load requirements, less any requirements that are served by reserved resources such as SEPA, are used. The amount of future reserves needed is compared to the amount of current and planned generation to gauge the need for future generating units.

The load forecast, as well as reserve margin and capacity information, is contained in the table that follows (see Table 4).

## Table 4

## Seasonal Projections of Load, Capacity, and Reserves (MW)

| W=Winter, S=Summer | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S | W | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 07/08 | 2008 | 08/09 | 2009 | 09/10 | 2010 | 10/11 | 2011 | 11/12 | 2012 | 12/13 | 2013 | 13/14 | 2014 | 14/15 | 2015 | 15/16 | 2016 | 16/17 | 2017 |
| **Forecast Requirements** (1) | | | | | | | | | | | | | | | | | | | | |
| 1 Santee Cooper System Peak | 5,649 | 5,431 | 5,851 | 5,617 | 6,074 | 5,821 | 6,189 | 5,932 | 6,302 | 6,042 | 6,426 | 6,161 | 6,552 | 6,282 | 6,679 | 6,404 | 6,800 | 6,522 | 6,928 | 6,645 |
| 2 DSM & Enrg. Eff. Savings (2) | (257) | (135) | (288) | (154) | (320) | (174) | (352) | (195) | (386) | (216) | (419) | (236) | (453) | (257) | (488) | (277) | (521) | (300) | (555) | (321) |
| 3 Interruptible Load | (332) | (332) | (332) | (332) | (332) | (332) | (332) | (332) | (332) | (332) | (332) | (332) | (332) | (332) | (332) | (332) | (332) | (332) | (332) | (332) |
| 4 Firm Sales | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| 5 Total Reserved Load | 5,343 | 5,125 | 5,545 | 5,311 | 5,768 | 5,515 | 5,883 | 5,626 | 5,996 | 5,736 | 6,120 | 5,855 | 6,246 | 5,976 | 6,373 | 6,098 | 6,494 | 6,216 | 6,622 | 6,339 |
| 6 Load Not Requiring Reserve | (619) | (619) | (411) | (411) | (411) | (411) | (411) | (411) | (411) | (411) | (411) | (411) | (411) | (411) | (411) | (411) | (411) | (411) | (411) | (411) |
| 7 Total Load Requiring Reserve | 4,724 | 4,506 | 5,134 | 4,900 | 5,357 | 5,104 | 5,472 | 5,215 | 5,585 | 5,325 | 5,709 | 5,444 | 5,835 | 5,565 | 5,962 | 5,687 | 6,083 | 5,805 | 6,211 | 5,928 |
| **Cumulative System Capacity** | | | | | | | | | | | | | | | | | | | | |
| 8 Existing Generating Capacity | 5,309 | 5,131 | 5,309 | 5,131 | 5,309 | 5,131 | 5,309 | 5,131 | 5,309 | 5,131 | 5,309 | 5,131 | 5,309 | 5,131 | 5,309 | 5,131 | 5,309 | 5,131 | 5,309 | 5,131 |
| 9 Catawba Entitlement | 208 | 208 | | | | | | | | | | | | | | | | | | |
| 10 Renewable Resources (3) | 13 | 16 | 23 | 30 | 31 | 32 | 42 | 45 | 85 | 85 | 135 | 135 | 135 | 135 | 175 | 175 | 175 | 175 | 215 | 215 |
| 11 Projected Resource Additions (4) | 0 | 0 | 580 | 580 | 580 | 580 | 580 | 580 | 750 | 728 | 750 | 1,328 | 1,350 | 1,328 | 1,350 | 1,328 | 1,841 | 1,819 | 1,841 | 1,819 |
| 12 Available Generating Capacity | 5,530 | 5,355 | 5,912 | 5,741 | 5,920 | 5,743 | 5,931 | 5,756 | 6,144 | 5,944 | 6,194 | 6,594 | 6,794 | 6,594 | 6,834 | 6,634 | 7,325 | 7,125 | 7,365 | 7,165 |
| Cumulative Purchase Contracts | | | | | | | | | | | | | | | | | | | | |
| 13 Long Term | 411 | 411 | 411 | 411 | 411 | 411 | 411 | 411 | 411 | 411 | 411 | 411 | 411 | 411 | 411 | 411 | 411 | 411 | 411 | 411 |
| 14 Mid Term Contract | | | | | | | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | | | | | | |
| 15 Proj Short Term Contract | | | | | 25 | 25 | | | | | | | | | | | | | | |
| 16 Cumulative Production Capacity | 5,941 | 5,766 | 6,323 | 6,152 | 6,356 | 6,179 | 6,502 | 6,327 | 6,715 | 6,515 | 6,765 | 7,165 | 7,365 | 7,165 | 7,245 | 7,045 | 7,736 | 7,536 | 7,776 | 7,576 |
| **Reserves** | | | | | | | | | | | | | | | | | | | | |
| 17 Generating Reserves | 598 | 641 | 778 | 841 | 588 | 664 | 619 | 701 | 719 | 779 | 645 | 1,310 | 1,119 | 1,189 | 872 | 947 | 1,242 | 1,320 | 1,154 | 1,237 |
| 18 % Reserve Margin | 13% | 14% | 15% | 17% | 11% | 13% | 11% | 13% | 13% | 15% | 11% | 24% | 19% | 21% | 15% | 17% | 20% | 23% | 19% | 21% |

1 Based on 2007 Load Forecast with Energy Efficiency and DSM

2 For information purposes only, included in Santee Cooper System Peak.

3 Renewable Resources include existing and projected Landfill Gas generation and other renewable generation.

4 Projected Resource Additions include a 600 MW Coal-fired unit in 2009, (2) 85 MW combustion turbines in 2012, a 600 MW Coal-fired unit in mid-2013, and a 491 MW nuclear unit in 2016.

# IV. Generation Expansion Plan

Santee Cooper's overall power supply objective is to continue to satisfy the electric demand and energy needs of its customers with economical and reliable service. In developing a generation expansion plan to accomplish these objectives, Santee Cooper follows a systematic process in accordance with standard industry practice.

The company begins its resource planning process by reviewing its past load history and developing a load forecast that extends 20 years into the future. Following the determination of future load, potential supply-side generating resources are screened to determine which units would be viable and the most cost effective to be included for consideration in the plan. Santee Cooper considers the possible addition of a variety of new power resources, which may include nuclear, natural gas, oil and coal-fired units, renewable resources, as well as long-term power purchase agreements.

Assumptions about the future operating environment as well as the various costs associated with operating the new units and overall system are also defined during the process of screening supply-side options. These assumptions are used to develop a recommended generation resource plan.

Santee Cooper then undergoes rigorous financial and risk analysis to verify that the recommended generation resource plan meets Santee Cooper's needs under a variety of different scenarios resulting from changing various assumptions.

After a methodical examination and analysis of the developed assumptions, modeling of a variety of different generation mixes, and a thorough analysis of the financial and risk sensitivity of the model results, the following preliminary conclusions were reached:

- Purchase power and build Combustion Turbines for short term reserves,
- Continue to pursue up to (2) Coal units at the Pee Dee site beginning 2013 or earlier, and
- Continue to pursue Nuclear generation options.

More specifically, Santee Cooper recommended the following:

1) Continue permitting and construction of Pee Dee Unit 1.
2) Continue permitting of Pee Dee Unit 2.
3) Begin permitting of approximately 250 MW of combustion turbines and begin construction of approximately 170 MW of combustion turbines to begin commercial operations no later than January 2012.
4) Purchase 160MW beginning in 2011 and continuing through 2014.
5) Continue nuclear license application process and negotiations with nuclear vendors.
6) Monitor legislation related to carbon emissions.
7) Evaluate the Plan on a periodic basis to determine the impacts of carbon legislation, nuclear negotiations, and updated cost information on the Plan.

Santee Cooper's Board of Directors considered and appropriately balanced the factors set forth in South Carolina Code section 58-31-55 (A)(3) and determined that adoption of the Plan was in the best interest of the Authority. The Plan was adopted on April 25, 2008.

# V. Transmission System Adequacy

Santee Cooper's transmission and distribution lines, as well as substations, deliver from the generating stations the reliable, low-cost power expected by customers. Santee Cooper operates an integrated transmission system which includes lines owned and leased by Santee Cooper as well as those owned by Central. The transmission system includes approximately 4,608 miles of transmission lines (see Figure 2). Santee Cooper operates 84 transmission substations and switching stations serving 78 distribution substations and 354 Central Cooperative delivery points. Santee Cooper plans the transmission system to operate during normal and single contingency conditions and to maintain system voltages that are consistent with good utility practice.

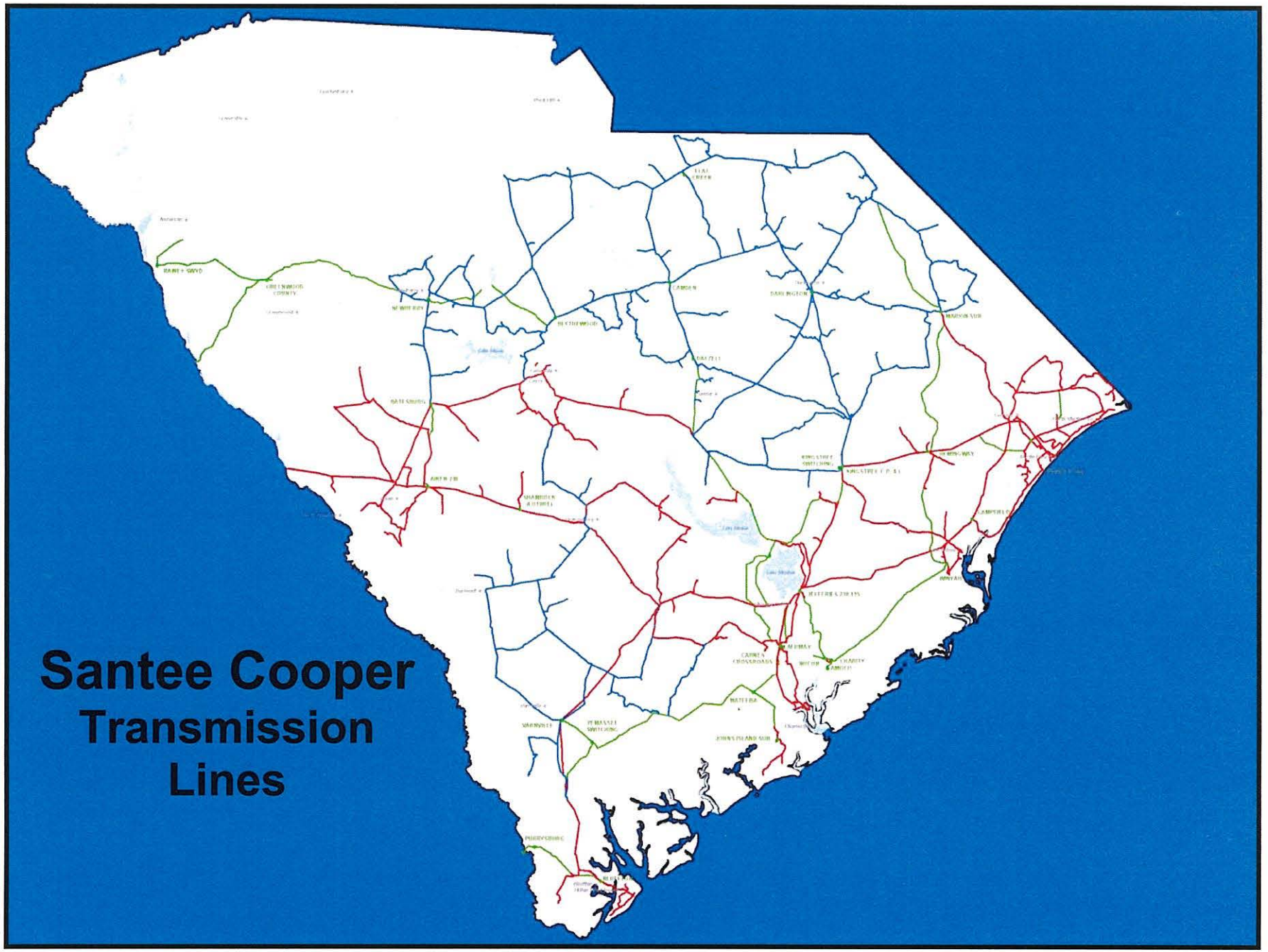
Santee Cooper's transmission system is interconnected with other major electric utilities in the region. It is directly interconnected with SCE&G at eight locations; with Progress Energy Carolinas ("Progress Energy") at seven locations; with Southern Company Services, Inc. ("Southern Company") at one location; and with Duke Energy Carolinas, a subsidiary of Duke Energy Corporation ("Duke"), at two locations. Santee Cooper is also interconnected with SCE&G, Duke, Southern Company and SEPA through a five-way interconnection at SEPA's J. Strom Thurmond Hydroelectric Project, and with Southern Company and SEPA through a three-way interconnection at SEPA's R. B. Russell Hydroelectric Project. Through these interconnections, Santee Cooper's transmission system is integrated into the regional transmission system serving the southeastern areas of the United States and the Eastern Interconnection. Santee Cooper has separate interchange agreements with each of the companies with which it is interconnected which provide for mutual exchanges of power.

Santee Cooper is party to the Virginia-Carolinas Reliability Agreement ("VACAR") which exists for the purpose of safeguarding the reliability of the electric service of the parties thereto. Other parties to the VACAR agreement are SCE&G, Progress Energy, Duke, SEPA, APGI-Yadkin Division., Dominion Virginia Power, North Carolina Electric Membership Corporation, North Carolina Eastern Municipal Power Agency, North

Carolina Municipal Power Agency #1 and Public Works Commission of the City of Fayetteville.

As a party to VACAR, Santee Cooper is also a member of the SERC Reliability Corporation, which is one of 8 regions of the North American Electric Reliability Corporation.

Figure 2



# VI. Energy Efficiency, Conservation, and Demand Side Management (DSM) Activities

Demand-side management ("DSM") programs, including energy efficiency and conservation programs, are evaluated on a regular basis for their effect on energy and demand. Santee Cooper offers these DSM programs where cost effective and continues to search for ways to promote energy conservation. In the fall of 2007, Santee Cooper established a Conservation and Renewable Energy Department. This department focuses on developing new energy efficiency and conservation programs, as well as obtaining renewable resources to serve load. Additionally, Santee Cooper has developed rates that have encouraged over 400 MW of peak load control by industrial customers. The company understands the necessity of resource conservation, and the importance of load control. However, as Santee Cooper continues to evaluate and adjust the load forecast and resource plans to meet future customer demand in a reliable and cost effective manner, the need for future generation resources is still apparent.

The impacts of the projected participation by Santee Cooper's directly served retail customers in existing and potential future programs as well as participation by the Central member cooperatives in their existing and potential future programs were considered when developing the 2008 Generation Plan. The list of current programs offered by Santee Cooper to its directly served retail customers and their general descriptions follows:

*1. Good Cents New and Improved Home Program*

The Good Cents Program was developed to provide residential customers an incentive to build new homes to higher levels of energy efficiency and improve existing homes by upgrading heating and air conditioning equipment and the thermal envelope to high energy efficiency standards. All homes are evaluated to determine if they meet the standards set for the program. Inspections are completed during construction for new homes and at the completion of construction for new and improved homes. A Good Cents Loan program is available for making upgrades to existing homes for insulation,

replacement windows, insulated doors, calking and weather stripping, heat pump water heaters, high-efficiency electric heat pumps, electric water heaters, electric ranges and solar water heaters. The loans range from $500 to $20,000.

Program participation in 2007 resulted in an estimated demand savings of 15,950 kW and estimated energy savings of 22,786,500 kWh. Total expenditures for the Good Cents Program incurred through Santee Cooper in 2007 were $1,465,833.19. (Demand savings are based on summer peak demand reduction of 1.05 kW).

*2. $H_2O$ Advantage Water Heating Program*

$H_2O$ Advantage is a storage water heating program designed to shift the demand related to water heating off-peak. This is accomplished with the installation of an electronic timer or radio controlled switch on an 80 gallon water heater. This program began in 1990 and was offered for the last time in 2000. The contract spans 10 years so this program will no longer be impacting the system after 2010.

Program participation in 2007 resulted in an estimated demand savings of 928 kW. Total expenditures for the $H_2O$ Advantage Program incurred through Santee Cooper in 2007 for existing participants were $84,848.27.

*3. Commercial Good Cents*

Commercial Good Cents is offered to commercial customers building new facilities that improve the efficiency in the building thermal envelope, heating and cooling equipment, and lighting. Commercial customers that meet program standards are given an up-front rebate to encourage participation in the program.

Program participation in 2007 resulted in an estimated demand savings of 20 kW and estimated energy savings of 32,251 kWh. Total expenditures for the Commercial Good Cents Program incurred through Santee Cooper in 2007 were $7,171.

*4. Thermal Storage Cooling Program*

The Thermal Storage Cooling Program shifts energy used by commercial customers for air conditioning from peak to off-peak hours by utilizing thermal energy stored in a medium such as ice or water. Rebates are offered to customers who install this type of equipment. There is currently one active participant in this program and an estimated demand reduction of 203 kW.

*5. Energy Efficient Lighting*

In 2008, Santee Cooper's Board of Directors approved a new conservation initiative that will allow its residential customers to receive energy efficient light bulbs. This program encourages the use of compact fluorescent lights (CFL) in homes served by Santee Cooper as a way to conserve energy. Under this program, residential customers received a voucher in their electric bill which could be redeemed for twelve Energy Star, 75-watt equivalent CFLs. With more than 135,000 direct serve residential customers, the potential number of CFLs to be provided by Santee Cooper will be approximately 1.6 million bulbs at a cost of approximately $2.7 million. This equates to over 68,000 MWh per year in total energy savings. The program will also have an educational component detailing information on the energy savings from switching from traditional light bulbs to CFLs. As of the middle of July 2008, Santee Cooper has given away over 500,000 CFL's to over 45,000 customers.

*6. Interruptible / Economy Power Pricing Rates*

Santee Cooper has developed and offers time-of-use, non-firm, and off-peak rates to its direct-served residential, commercial and industrial customers to encourage them to reduce their peak demand. The use of these rates is taken into account when developing the load forecast and generation plan.

An "economy power" rate is available to industrial customers, which is based on an hourly incremental energy rate. This is a real time pricing rate; the price for energy changes each hour. Customers must schedule their usage each hour. Service under this

Rider is curtailable in emergency situations by Santee Cooper. Pricing alternatives are available under this rate where the energy price is fixed during certain hours. There are also supplemental curtailable and interruptible rates available to industrial customers which allow for curtailment under certain circumstances.

As part of Santee Cooper's demand control program, currently there are over 500 MW's of load taking service under interruptible and economy power schedules. This load is excluded from the peak demand calculations for generation planning and reserves resource planning.

# VII. Renewable Resources and Programs

### *1. Renewable Energy*

HYDRO

Santee Cooper's largest source of renewable energy is the hydro electric facilities that were developed during the birth of Santee Cooper. Since the 1940's the water that flows through the Santee Cooper lake system has played an integral role in the ability of Santee Cooper to provide low cost reliable power. Originally the hydro units were Santee Cooper's only source of generating capacity. As Santee Cooper grew over the years the hydro electric units on the lake have gradually shifted from the sole source of electric generation to being used mainly as peaking capacity today.

While there are no practical larger hydro projects the scale of the Santee Cooper lake system available in the state there may be the potential to develop small scale projects distributed throughout the state. Santee Cooper has begun looking into potential projects and into the permitting that will be required. Also, Santee Cooper has contracted with Clemson University to develop a methodology to investigate the potential of small projects and to investigate some of these potential sites in the state.

BIOMASS

In 2001, Santee Cooper became the first utility in South Carolina to produce electric power using methane gas from landfills as a fuel source. Santee Cooper now has 13 MW of generating capacity that is fueled by methane gas collected at large landfills with plans to more than double that capacity by the end of 2010.

Santee Cooper is looking for ways to increase the use of various forms of biomass to produce electricity. Santee Cooper is investigating the potential of using various wood sources as a fuel, and the potential for methane produced from agricultural waste. Santee Cooper has partnered with Clemson University and one of the state's many farmers to investigate using animal waste in an anaerobic digester to produce methane gas to fuel a generator.

SOLAR

Santee Cooper has developed a Solar School program that is very successful in the middle schools where the program has been setup. At the participating schools, Santee Cooper and the local electric cooperative installs a small 2.2 kW photovoltaic solar panel (PV) and provides a science curriculum. Currently there are 5 schools participating, with a total capacity of 11 kW, and plans to expand to an additional 15 schools over the next two years for a total Solar School capacity of over 40 kW. To provide training opportunities for the teachers that will be using the curriculum, a similar 2.2 kW PV panel has also been installed at our Wampee Conference Center.

While South Carolina is not an ideal state for solar potential, Santee Cooper continues to investigate and utilize this resource. In conjunction with our Green Power program, Santee Cooper built a Solar Pavilion at Coastal Carolina University that incorporates 14 kW PV capacity and is investigating other opportunities to place similar sized PV systems in high profile areas.

Another area where Santee Cooper is promoting the use of solar power is in our Solar Homes Initiative. In this program, Santee Cooper encourages consumers to install PV at their homes and sell any additional power that may be generated to Santee Cooper under its Net Billing rate schedule. Under the Solar Homes Initiative, Santee Cooper is offering a $3.00 per kW rebate to the first ten qualified customers, along with a zero percent interest, ten-year loan for installation costs not covered by the rebate.

WIND

In 2005 Santee Cooper began investigating the wind generating potential in the state. Santee Cooper partnered with the US Department of Energy and the South Carolina Energy Office to contract with AWS Truewind to provide wind mapping of South Carolina. Since the completion of the mapping, Santee Cooper has joined in on several partnerships to further the study of potential wind generation in the state.

Waties Island: Coastal Carolina University, Clemson University and Santee Cooper have partnered to study the wind resources along the northern Horry County coast. The project will investigate the feasibility of developing a commercial scale electric generating facility. A meteorological tower has been installed and wind data is currently being collected.

Baruch Institute: Using resources contributed by Santee Cooper, Clemson University, Savannah River National Labs, Sencondwind, the Baruch Foundation and the South Carolina Renewable Energy Infrastructure Grant, a meteorological tower will be installed to gather wind data for the area and a new wind measuring technology, developed by Sencondwind, will be tested/verified in this coastal environment. Following the testing, this new technology will improve the ability to take actual wind data in off-shore settings without the installation of large meteorological towers.

Wind for Schools: Santee Cooper has partnered with Clemson to install a small wind turbine at four coastal schools where the wind resource is determined to be adequate.

Coastal Carolina's Atlantic Center campus is scheduled to be the first location, and a training seminar on turbine installation will be held. Other locations in Georgetown and Horry Counties are under consideration.

Wind Lease Applications: The most promising generating potential from wind appears to be off-shore in federally regulated waters. Currently there are no rules or regulation established on obtaining permits or leases in these federal waters. The Department of Commerce's Minerals Management Service (MMS) has been designated as the agency to develop the process and requirements of obtaining leases and permits. To allow research to be conducted in parallel to the development of the process and requirements, MMS is accepting pre-applications for temporary leases on specific sites. To stay closely aligned to this process, Santee Cooper has submitted two pre-applications for four-acre sites off-shore of Georgetown and Little River.

### *2. GOFER Program*

Santee Cooper's Give Oil For Energy Recovery ("GOFER") program, in place since 1990, provides do-it-yourself oil changers a place to safely dispose of used motor oil. In 2007, Santee Cooper collected 1,659,229 gallons of used oil from more than 497 do-it-yourself sites and approximately 750 commercial sites. This oil was safely converted into 16, 884,314 kilowatt-hours of power with a savings of more than $1,140,822 in fuel costs.

### *3. Green Power Program*

With the addition of landfill methane generation in 2001, Santee Cooper began its Green Power program in which customers can pay an extra $3.00 per 100 kWh block on their electric bills to support future expansion of Santee Cooper renewable energy. Currently the majority of Santee Cooper's Green Power is produced from a form of Biomass – landfill methane. Santee Cooper's Green Power program continues to be successful, and has expanded to include its Green Power Tags program. The Green Power Tags program allows any South Carolina citizen to purchase Green Power Tags. As of December 31, 2007, more than 5,700 industries, businesses and homeowners all across the state have joined the effort to protect the environment by purchasing Green Power. All of Santee

Cooper's Green Power and Green Power Tags are certified through the Center for Resource Solutions' (CRS) Green-e Program.

## VIII. Environmental

Santee Cooper is ever mindful of balancing the responsibility of being an environmental steward with reliable, low-cost power. Protecting the state's environment plays an important role in the company's planning for new facilities. Santee Cooper is proud to operate some of the cleanest coal-fired generating stations in the country. Eighty-eight percent (88%) of Santee Cooper's coal-fired generating units will have state of the art emission control equipment by 2009. Scrubbers work to remove sulfur dioxide from power plants so that emissions are not released into the atmosphere. Of all the coal plants in South Carolina and Georgia there are only 10 scrubbed units, and Santee Cooper operates 8 of them. The two new units at Cross Generating Station are being built with no net increase of nitrogen oxide or sulfur dioxide emissions at the facility.

## Conclusion

Santee Cooper has been a leader in protecting our environment, being the first utility in the state to offer Green Power, generating electricity using landfill gas, promoting conservation and energy efficiency, installing state-of-the-art emission control technology, and funding innovative research into alternative forms of energy. Santee Cooper continues to evaluate and adjust the load forecast and resource plans as needed to meet future customer demand in a reliable and cost effective manner. Demand-side management programs are evaluated on a regular basis for their effect on energy and demand. Santee Cooper offers these DSM programs where cost effective, and has completed generation resource planning necessary to ensure a reliable generation plan to meet projected customer requirements through 2024. Additionally, Santee Cooper has developed rates that have encouraged over 500 MW of contracted peak load control by industrial customers.