219006

STATE OF SOUTH CAROLINA

South Carolina Electric & Gas Company's Integrated Resource Plan from 2006 - Present

BEFORE THE
PUBLIC SERVICE COMMISSION
OF SOUTH CAROLINA

COVER SHEET

DOCKET NUMBER: 2009-9-E ~~2006 - 103 - E~~

(Please type or print)

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DOCKETING INFORMATION (Check all that apply)

☐ Emergency Relief demanded in petition ☐ Request for item to be placed on Commission's Agenda expeditiously

☐ Other:

INDUSTRY (Check one)	NATURE OF ACTION (Check all that apply)		
☒ Electric	☐ Affidavit	☒ Letter	☐ Request
☐ Electric/Gas	☐ Agreement	☐ Memorandum	☐ Request for Certificatio
☐ Electric/Telecommunications	☐ Answer	☐ Motion	☐ Request for Investigatior
☐ Electric/Water	☐ Appellate Review	☐ Objection	☐ Resale Agreement
☐ Electric/Water/Telecom.	☐ Application	☐ Petition	☐ Resale Amendment
☐ Electric/Water/Sewer	☐ Brief	☐ Petition for Reconsideration	☐ Reservation Letter
☐ Gas	☐ Certificate	☐ Petition for Rulemaking	☐ Response
☐ Railroad	☐ Comments	☐ Petition for Rule to Show Cause	☐ Response to Discovery
☐ Sewer	☐ Complaint	☐ Petition to Intervene	☐ Return to Petition
☐ Telecommunications	☐ Consent Order	☐ Petition to Intervene Out of Time	☐ Stipulation
☐ Transportation	☐ Discovery	☐ Prefiled Testimony	☐ Subpoena
☐ Water	☐ Exhibit	☐ Promotion	☐ Tariff
☐ Water/Sewer	☐ Expedited Consideration	☐ Proposed Order	☐ Other:
☐ Administrative Matter	☐ Interconnection Agreement	☐ Protest	
☐ Other:	☐ Interconnection Amendment	☐ Publisher's Affidavit	
	☐ Late-Filed Exhibit	☐ Report	

K. Chad Burgess
Senior Counsel

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SCANA® POWER FOR LIVING

February 27, 2009

VIA ELECTRONIC FILING

The Honorable Charles Terreni
Public Service Commission of South Carolina
101 Executive Center Drive
Columbia, South Carolina 29210

RE: South Carolina Electric & Gas Company's Integrated Resource Plan from 2006-Present
Docket No. ~~2006-103-E~~ 2009-9-E

Dear Mr. Terreni:

In accordance with S.C. Code Ann. §58-37-40 (1976, as amended) and Order No. 98-502 enclosed you will find the 2009 Integrated Resource Plan of South Carolina Electric & Gas Company ("SCE&G"). This filing also serves to satisfy the annual reporting requirements of the Utility Facility Siting and Environmental Protection Act, S.C. Code §58-33-430.

By copy of this letter we are also serving the South Carolina Office of Regulatory Staff with a copy of SCE&G's 2009 Integrated Resource Plan and attach a certificate of service to that effect.

If you should have any questions or need additional information, please do not hesitate to contact me.

Very truly yours,

K. Chad Burgess

K. Chad Burgess

KCB/kms
Enclosures

cc: Shannon Bowyer Hudson, Esquire
(via hand delivery)

BEFORE

THE PUBLIC SERVICE COMMISSION OF

SOUTH CAROLINA

DOCKET NO. ~~2006-103-E~~ 2009-9-E

IN RE:

South Carolina Electric & Gas Company's Integrated Resource Plan from 2006 - Present	))))	**CERTIFICATE OF SERVICE**

This is the certify that I have caused to be served this day one (1) copy of the **2009 Integrated Resource Plan of South Carolina Electric & Gas Company** via hand delivery to the person named below at the address set forth:

Shannon Bowyer Hudson, Esquire
Office of Regulatory Staff
1401 Main Street, Suite 900
Columbia, SC 29201

Karen M. Scruggs

Columbia, South Carolina
This 27th day of February 2009

2009

Integrated

Resource

Plan

SCE&G®
A SCANA COMPANY

Introduction

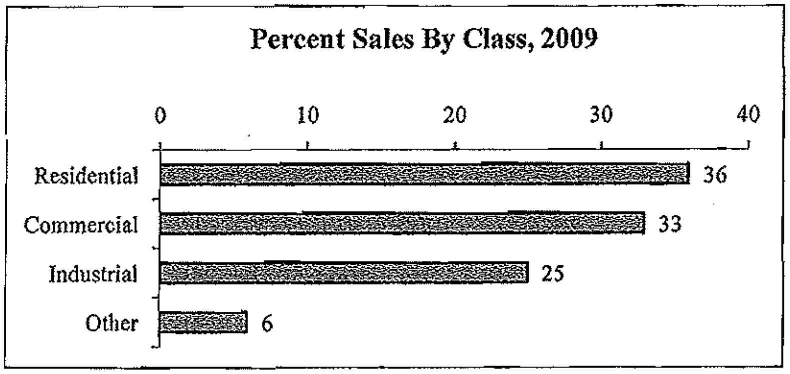
This document presents South Carolina Electric & Gas Company's (SCE&G) Integrated Resource Plan (IRP) for meeting the energy needs of its customers over the next fifteen years, 2009 through 2023. This document is filed with the Public Service Commission of South Carolina in accordance with S.C. Code Ann. §58-37-40 (1976, as amended) and Order No. 98-502 and also serves to satisfy the annual reporting requirements of the Utility Facility Siting and Environmental Protection Act, S.C. Code §58-33-430. The objective of the Company's IRP is to develop a resource plan that will provide reliable and economically priced energy to its customers.

The Load Forecast

Total territorial energy sales on the SCE&G system are expected to grow at an average rate of 1.7% per year over the next 15 years, while firm territorial summer peak demand and winter peak demand will increase at 2.0% and 1.8% per year, respectively, over this forecast horizon. The table below contains these projected loads.

	Summer Peak (MW)	Winter Peak (MW)	Energy Sales (GWH)
2009	4,722	4,147	22,836
2010	4,747	4,172	22,954
2011	4,931	4,355	23,884
2012	5,042	4,359	23,906
2013	5,142	4,423	24,232
2014	5,243	4,481	24,527
2015	5,344	4,573	24,996
2016	5,445	4,667	25,474
2017	5,550	4,760	25,950
2018	5,652	4,853	26,425
2019	5,752	4,946	26,899
2020	5,855	5,020	27,273
2021	5,964	5,117	27;768
2022	6,076	5,220	28,291
2023	6,194	5,325	28,827

The energy sales forecast for SCE&G is made for over 30 individual categories. The categories are subgroups of our seven classes of customers. The three primary customer classes, residential, commercial, and industrial, comprise about 94% of our sales. The following bar chart shows the relative contribution to territorial sales of each class in 2009.



The "other" classes are street lighting, other public authorities, municipalities and cooperatives. It should be noted that the "other" component is expected to decline to roughly 3% of sales by 2011 as several municipal contracts expire.

The forecasting process can be divided into two parts: development of the baseline forecast, followed by non-model adjustments. A detailed description of the short-range baseline forecasting process and statistical models is contained in Appendix A of this report. Short-range is defined as the next two years. Appendix B contains similar information for the long-range methodology. Sales projections to each group are based on statistical and econometric models derived from historical relationships.

Non-model Adjustments

Several adjustments were made to the baseline projections to incorporate substantive events not considered in the forecast methodology. These were increased air-conditioning and heat pump efficiency standards, improved lighting efficiencies, and the addition of several large industrial loads. The first two of these represent reductions to the forecast while the latter is additional load from the baseline.

Since the baseline forecast is based on historical relationships between energy use and driver variables such as weather, economics, and customer behavior, it embodies changes which have occurred between them over time. For example, construction techniques which result in tighter new houses have caused energy use as a result of the infiltration of unheated or uncooled air to decrease. Since this process happens with the addition of new houses and/or extensive home renovations, it occurs gradually. Over time this factor and others are captured in the forecast methodology. However, when significant events occur which will impact energy use but are not captured in the historical relationships, they must be accounted for outside the traditional model structure. The current forecast has three "non-model" adjustments of this nature, two being reductions to projected loads and the third an increase.

The first adjustment relates to federal mandates for air-conditioning units and heat pumps. In 2006 the minimum SEER (Seasonal Energy Efficiency Ratio) for newly manufactured appliances was raised from 10 to 13, which means that cooling loads for a house that replaced a 10 SEER unit with a 13 SEER unit would decrease by 30%. The last mandated change to efficiencies like this took place in 1992, when the minimum SEER was raised from 8 to 10. Since then air-conditioner and heat pump manufacturers introduced much higher-efficiency units, and models are now available with SEERs up to 19. However, overall market production of heat pumps and air-conditioners is concentrated at the lower end of the SEER mandate, so the new ruling represented a significant change in energy use which was not captured in the current forecast. For this reason a non-model adjustment was warranted.

A second reduction was made to the baseline energy projections beginning in 2012 for savings related to lighting. Mandated federal efficiencies as a result of the Energy Independence and Security Act of 2007 will take effect that year, and be phased in through 2014. Standard incandescent light bulbs are inexpensive and provide good illumination, but they are extremely inefficient. Compact fluorescent light bulbs (CFLs) have become increasingly popular over the past several years as substitutes. They last much longer and generally use about one-fourth the energy as that of standard light bulbs. However, CFLs are more expensive and still have some unpopular lighting characteristics, so their large-scale use as a result of market forces was not guaranteed. The new mandates will not force a complete switchover to CFLs, but they will impose efficiency standards that can only be met by them or newly developed high-efficiency incandescent light bulbs. Again, this shift in lighting represents a change in energy use which was not present in the historic data, so it too was modeled as a non-model adjustment.

The final adjustment to the baseline forecast was to account for new industrial growth on SCE&G's system. Industrial use generally tracks economic indicators. However, when a large customer begins operations or a significant expansion occurs they should be treated independently of the normal baseline forecasting process. Discussions with industrial and economic development representatives within the company identified several expansions which justified individual handling.

The following table provides the annual reductions in territorial energy attributable to these non-model adjustments.

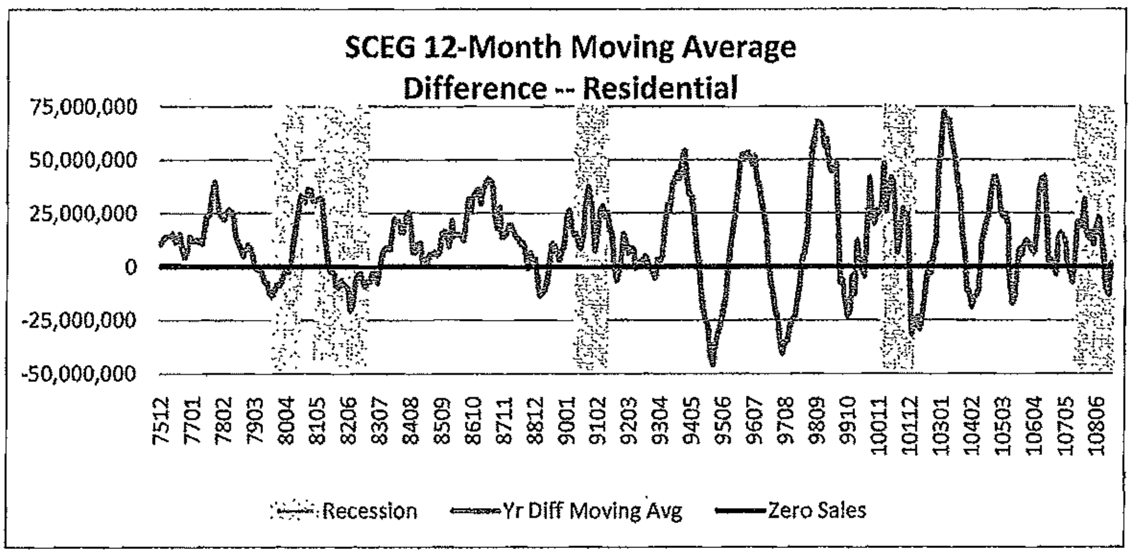
	Baseline Forecast	Large Customer Change	Interim Forecast (GWH)	% Efficiency Impact	Adjusted Forecast (GWH)
2009	24286	0	22836	0.0	22836
2010	24113	0	22954	0.0	22954
2011	23591	331	23922	-0.2	23884
2012	24144	331	24475	-2.4	23906
2013	24639	374	25013	-3.2	24232
2014	25153	374	25527	-4.0	24527
2015	26575	374	26949	-4.1	24996
2016	26205	374	26579	-4.2	25474
2017	26734	374	27108	-4.3	25950
2018	27262	374	27636	-4.4	26425
2019	27788	374	28162	-4.5	26899
2020	28311	374	28685	-5.0	27273
2021	28863	374	29237	-5.1	27768
2022	29444	374	29818	-5.2	28291
2023	30040	374	30414	-5.3	28827

The forecast of summer peak demand is developed using a load factor methodology. Load factors for each class of customer are associated with the corresponding forecasted energy to project a contribution to summer peak. The winter peak demand is projected through its correlation with annual energy sales and winter degree-day departures from normal. By industry convention, the winter period is assumed to follow the summer period.

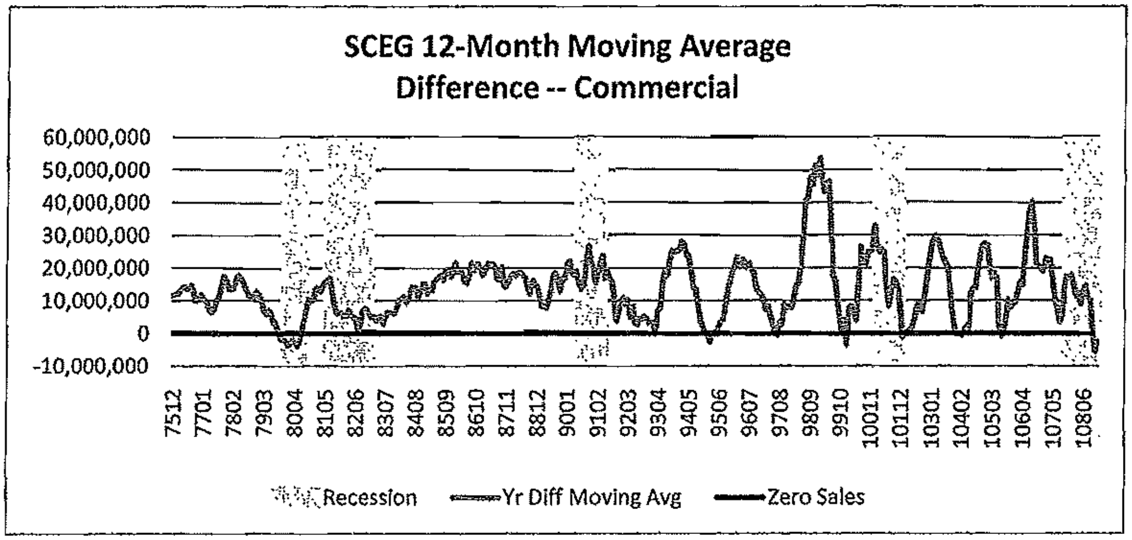
Response of SCE&G Sales In Previous Recessions

The economy is in the midst of a serious recession, with its timing and ultimate severity yet to be determined. With these uncertainties it is useful to consider how SCE&G's historic sales have responded to earlier recessions. Monthly data is available for SCE&G by class from January 1974 through December 2008, which allows for comparison of past sales performance both during and after the four most recent recessions. The following charts below depict change in the 12-month moving sales average from the same month one year ago, on a non weather-normalized basis. Values above zero indicate overall growth, while negative results indicate a decline. Recessions are indicated by yellow shaded bars. Note that the majority of data points fall above the zero line indicating growth.

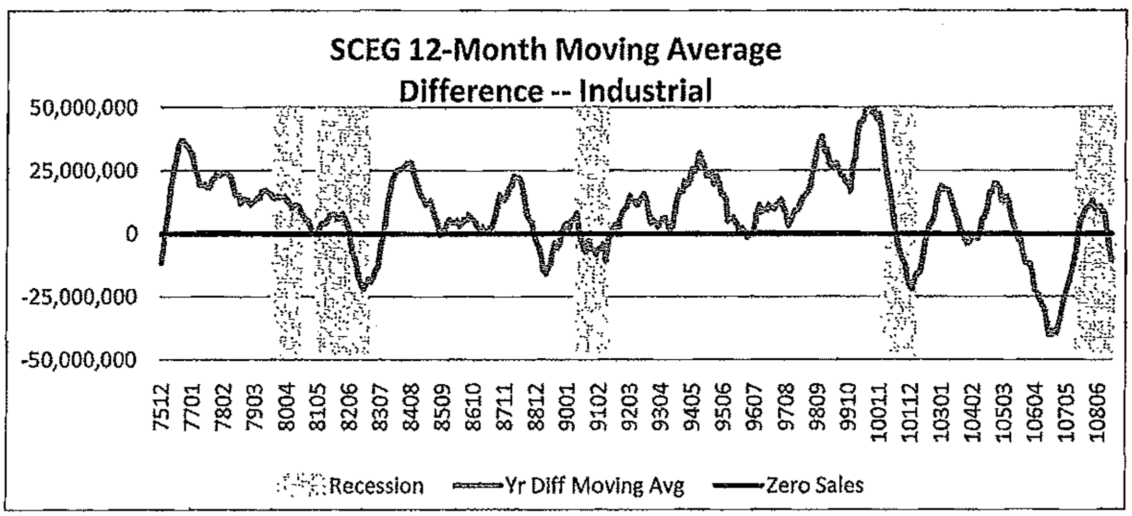
Looking at residential sales first, it can be seen that the response to prior recessions while they occurred has been mixed. Sales increased throughout in the first of the "twin" recessions in 1980, but then declined in the second. There was little impact in the 1991 recession, with a similar result in the 2001 economic downturn except for the last few months. They saw a sharp decline in sales. The current recession is now officially dated from December 2007, and the residential sector remained positive throughout most of 2008, becoming negative only at the end of the year. Of greater importance, this chart indicates that historically recession impacts have been short-lived for the residential group. Once the economy had recovered and real income growth resumed, growth in numbers of customers and sales of electricity resumed as well.



Commercial sales are especially notable for their strength throughout the 34 years of data shown below. With two small, weather-related, exceptions, sales were positive from the 1980 recession until the last two months of 2008. This is indicative of the growth of service-related industries in recent history.



Finally, the industrial sector shown below has behaved as might be expected in recessions, with decreases in actual sales except for the 1980 downturn. The negative results shown in the last quarter of 2008 will persist throughout 2009, both as a result of lower demand for products from existing customers and from decreases stemming from plant closures. This group is the most economically sensitive of SCE&G's major customer classes, but the record shows that even industrial sales have rebounded and experienced growth after a recession has passed.



The conclusion which is reached from the above is that economic contractions do cause sales to slow, and in some cases, to decrease. However, once the economy begins to expand, all of SCE&G's sales classifications have regained their footing and continued their long-term growth pattern. Therefore, while the forecast incorporates sales reductions in 2009 and part of 2010 as a result of the current recession, there is strong historical evidence that sustained growth will reoccur in the long-run. SCE&G must plan its system to serve this growth.

Demand-Side Management at SCE&G

The Demand-Side Management Programs at SCE&G can be divided into three major categories: Customer Information Programs, Energy Conservation Programs and Load Management Programs. The Customer Information Programs and Energy Conservation Programs can also be categorized as Energy Efficiency Programs while the Load Management Programs are also known as Demand Response Programs.

Customer Information Programs

SCE&G's customer information programs fall under two headings: the annual energy campaigns and the web-based information initiative. Following is a brief description of each.

1. **The 2008 Energy Savings Campaigns:** In 2008, SCE&G continued to proactively educate its customers and create awareness of issues related to energy efficiency and conservation.

- **Bill Inserts/Messages** – Bill inserts/messages distributed to over 625,000 residential customers to include promoting our Online Energy Audit Tool (at www.SCE&G.com), Project SHARE (a financial assistance program funded by SCE&G customers and employees to help low-income customers pay their winter heating bills), and "10 Ways to Save Energy" from September through December 2008.
- **SCE&G Business Offices (Print Campaign):** State-wide Business Office Campaign (37 locations) implemented September through December 2008 to include fall/winter energy savings tips via posters, fliers, drive-thru envelopes and "energy savings" buttons worn by all customer representatives.
- **News Releases** – Distributed to print and broadcast media throughout SCE&G's service territory on a variety of energy savings programs and services to include Project SHARE and Weatherization. **NOTE:** On October 8, 2008, SCE&G also announced a corporate gift of $250,000 to Project SHARE and provided a dollar-for-dollar match on customer and employee donations up to $100,000 through the end of 2008.
- **Web Site Promotions (www.SCE&G.com)** – Significant updates to SCE&G web site to include energy saving tips and other conservation information www.SCE&G.com/myenergy. This unique vanity URL address was promoted in the majority of our communication channels from September through December 2008.

- **Weatherization Project** – SCE&G, the Governor's Office of Economic Opportunity and the Aiken/Barnwell/Lexington Community Action Agency joined forces to help low-income customers weatherize their homes during the winter months. SCE&G also donated $50,000 for weatherization projects, which included homes in Columbia and Conway. Nearly 100 SCE&G employee volunteers assisted in the effort.
- **Speakers Bureau** – Representatives from SCE&G made presentations on energy efficiency and conservation programs to several organizations in 2008 including church groups, senior citizen and low-income housing communities, civic organizations, builder groups and homeowner associations.
- **Energy Awareness Month (October)** – The Company used the month as an opportunity to send information to the media discussing energy costs and savings tips. In addition, a state-wide, six-week print campaign was developed and implemented focusing on energy savings tips consistent with our Business Office Campaign. Included ad placement in The State Newspaper (Columbia), The Post and Courier (Charleston), and The Aiken Standard (Aiken) with a drive-to-web for www.SCE&G.com/myenergy for more detailed and comprehensive information on "Tools for Saving" and "Ways to Help Others". This campaign reached more than 760,000 South Carolina residents on a weekly basis from mid-October through November 2008.
- **Energy Wise Newsletter** – Provides energy efficiency and conservation information for all customer classifications. The newsletter is directly mailed to more than 625,000 residential customers in September 2008.
- **Radio Advertising:** SCE&G ran a 20-week radio campaign on conservation (series of four 30 second spots) that featured simple energy savings tips on the following South Carolina stations: WCOS AM/FM, WLTY FM, WNOK FM, WVOC AM, WXBT FM, SCOS AM/FM, SLTY FM, SNOK FM, SVOC AM and SXBT FM. Implementation took place during late summer/early fall 2008.
- **Television Advertising:** "Dream a Little Green" (series of three 30 second spots promoting conservation and energy efficiency) aired during fall season 2008 on cable television in the Columbia, Charleston and Aiken markets via HGTV, TLC, CNN and Fox News.
- **Public Service Announcements (Television):** PSAs were produced and distributed to Columbia and Charleston markets promoting Project SHARE – a program designed to

help low-income, handicapped and elderly customers pay their fuel bills. The program provides direct assistance to those who need it for the purchase of electricity, gas, kerosene and other fuels. The funds are made possible through the generous contributions of SCE&G customers, employees and retirees. PSA's ran in December 2008.

- **Energy Star Partnership:** SCE&G signed an agreement with Energy Star in 2008, giving our company permission to use their logo on appropriate marketing communications to our customers. This partnership also gave us access to additional tools and resources for promoting energy efficiency to our customers, including Energy Star literature for distribution at trade shows, conferences and events.

2. **WEB-Based Information and Services Programs:** SCE&G's online offerings can be broken into three components: the Energy Analyzer tool, the online Energy Audit tool and Customer Awareness Information. Altogether there have been more than 2.6 million visits to SCE&G's website in 2008. Feedback has been positive. Customers must be registered to use the interactive tools: Energy Analyzer and Energy Audit. There are almost 219,000 customers registered for this access. Following is a description of these components:

- **Energy Analyzer:** Energy Analyzer, added in 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 almost 100,000 visits to the Energy Analyzer tool in 2008.
- **Energy Audit:** The Energy Audit tool, added to the site in August 2008, 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. Since August 2008, almost 3,700 customers have used the Energy Audit tool.
- **Customer Awareness Information:** The SCE&G Web site supports all communication efforts to promote energy savings tips through a new section called "Save Energy & Money" and through the Energy Audit library. Energy savings information includes how-to videos on insulation, thermostats and door and windows. Information on the latest tax credits offered by the Emergency Economic Stabilization Act of 2008 is also available,

including links to help customers explore and learn how they can take advantage of these credits. For business customers, online information also includes: power quality technical assistance, conversion assistance, new construction information, expert energy assistance and more.

Energy Conservation Programs

There are four energy conservation programs: the Value Visit Program, the In-Home Energy Consultation, the Conservation Rate and our use of seasonal rate structures. A description of each follows:

1. Value Visit Program: The Value Visit Program is designed to assist residential electric customers who are considering an investment in upgrading their home's energy efficiency. We speak with the customer either by phone, through email or by visiting the customer's home, and guide them in their purchase of energy related equipment and materials such as heating and cooling systems, duct insulation, attic insulation, storm windows, etc. Our representative explains the benefits of upgrading different areas of the home and what affect upgrading these areas will have on energy bills and comfort levels as well as informing the customer on the many rebates we offer for upgrading certain areas of the home (see rebate schedule below). We also offer financing for qualified customers which makes upgrading to a higher energy efficiency level even easier. There is a $25 charge for the program, but this charge is reimbursed if the customer implements any suggested upgrade within 90 days of the visit. Information on this program is available on our website and by brochure.

   0 to R30 attic insulation - $6.00 per 100 sq. ft.
   R11 to R30 attic insulation - $3.00 per 100 sq. ft.
   Storm windows - $30.00 per house
   Duct insulation - $60.00 per house
   Wall Insulation - $80.00 per house

2. In-Home Energy Consultation: SCE&G's free in-home energy consultation is designed for residential customers who want to be proactive in managing their energy consumption. An Energy Services Representative will walk through your home with you, inspecting windows & doors, caulking, weather stripping, insulation levels, appliances, water heaters, HVAC, and assess your home's thermal efficiency.

3. Rate 6 Energy Saver / Energy Conservation Program: The Rate 6 Energy Saver / Energy Conservation Program rewards homeowners and home builders 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 very easy as the requirements are prescriptive and do not require a large monetary investment 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 standards which is also a significant benefit to participants. Information on this program is available on our website and by brochure.
4. 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.

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:

1. 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.

2. Interruptible Load Program: SCE&G has over 200 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.
3. 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.
4. 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.

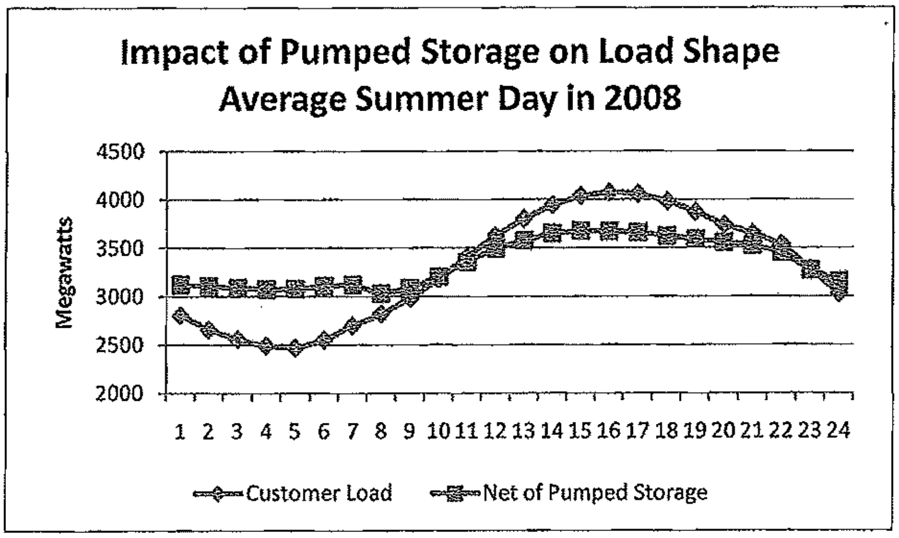
Load Impact of Load Management Programs

The Company relies on the standby generator program and the interruptible service program to help maintain the reliability of its electrical system. There are currently about 200 megawatts of capacity made available to the system through these programs. The table on the right shows the peak demand on the system with and without these programs. The firm peak demand is the load level that results when the DSM is used to lower the territorial peak demand.

Territorial Peak Demands			
Year	System Peak (MW)	DSM Impact (MW)	Firm Peak (MW)
2009	4,924	202	4,722
2010	4,947	200	4,747
2011	5,131	200	4,931
2012	5,242	200	5,042
2013	5,342	200	5,142
2014	5,443	200	5,243
2015	5,544	200	5,344
2016	5,645	200	5,445
2017	5,750	200	5,550
2018	5,852	200	5,652
2019	5,952	200	5,752
2020	6,055	200	5,855
2021	6,164	200	5,964
2022	6,276	200	6,076
2023	6,394	200	6,194

DSM From the Supply Side

SCE&G is able to achieve a DSM impact from the supply side using its Fairfield Pumped Storage Plant. The Company uses off-peak energy to pump water uphill into the Monticello Reservoir and then displaces on-peak generation by releasing the water and generating power. This accomplishes the same goal as many DSM programs, namely, shifting use to off peak periods and lowering demands during high cost, on-peak periods. The following graph shows the impact that Fairfield Pumped Storage had on a typical summer weekday during 2008.



In effect the Fairfield Pumped Storage Plant shaved about 380MWs from the daily peak times of 2:00pm through 6:00pm and moved almost 4% of customer's daily energy needs to the off peak. Because of this valuable supply side capability, a similar capability on the demand side, such as a time of use rate, would be less valuable on the SCE&G system than on many other utility systems.

DSM: Next Steps

SCE&G has begun a comprehensive evaluation of its portfolio of DSM programs with the specific intention of revitalizing its energy efficiency and demand response programs and introducing new DSM programs where appropriate. The Company, with the help of ICF International, has developed a comprehensive action plan to research, analyze, and introduce (as appropriate) additional DSM programs.

Below are some of the major steps in this process:

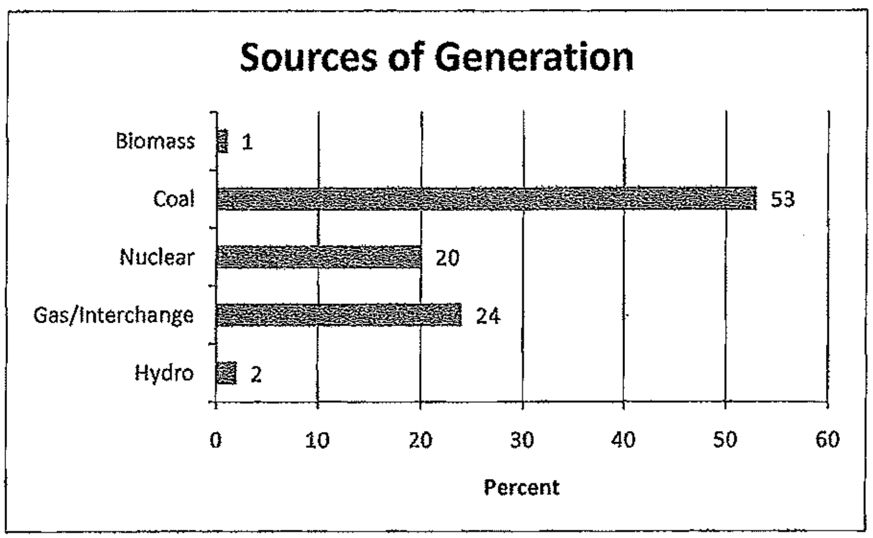
- Evaluation and validation of potential energy efficiency technologies or measures and their incremental energy savings, costs and longevity;
- Disaggregation of SCE&G customer energy consumption by customer type and energy end-uses;
- Screening of individual measures based on cost-benefit tests;
- Bundling of measures that pass the screening into groups of measures that would likely be delivered within an individual program;
- Forecasting of participation in each program under a variety of scenarios;
- Determination of the cost of each program including incentive, administration, marketing, measurement and verification and other costs;
- Determination of program cost effectiveness screening based on the bundled measures and program costs; and
- Development of DSM Supply Curves and estimated impacts on SCE&G system load

SCE&G's DSM evaluation study is on schedule. When the results of this analysis are complete, the Company anticipates rolling out new or revised DSM programs in a manner that balances issues such as rate impacts, customer equity, availability of qualified local trade allies and supporting infrastructure and other factors. In June 2009 SCE&G intends to present its findings and proposals for expanded DSM offerings to the Commission for review and approval along with mechanisms for capturing and recovering the costs associated with them.

Existing Supply Resources

SCE&G owns and operates ten (10) coal-fired fossil fuel units (2,475 MW), eight (8) combined cycle gas turbine/steam generator units (gas/oil fired, 1,317 MW), fourteen (14) peaking turbines (303 MW), four (4) hydroelectric generating plants (221 MW), and one Pumped Storage Facility (576 MW). In addition, we receive an output of 90 MW from a cogeneration facility. The total net non-nuclear summer generating capability rating of these facilities is 4,982 MW. These ratings are updated at least on an annual basis. When SCE&G's nuclear capacity (644 MW), a long term capacity purchase (25 MW) and additional capacity (33 MW) provided through a contract with the Southeastern Power Authority (SEPA) is added, SCE&G's total supply capacity is 5,684 MW. This is summarized in the table on the following page.

The bar chart below shows the projected 2009 relative energy generation by fuel source. SCE&G typically generates the majority of its energy from coal and nuclear fuel but with natural gas prices projected to be so low in 2009, SCE&G will generate more than is customary with this fuel.



Existing Long Term Supply Resources

The following table shows the generating capacity that is available to SCE&G.

	In-Service Date	Summer (MW)
Coal-Fired Steam:		
Urquhart – Beech Island, SC	1953	95
McMeekin – Near Irmo, SC	1958	250
Canadys - Canadys, SC	1962	400
Wateree – Eastover, SC	1970	700
*Williams – Goose Creek, SC	1973	610
Cope - Cope, SC	1996	420
Cogen South – Charleston, SC	1999	90
Total Coal-Fired Steam Capacity		2,565
Nuclear:		
V. C. Summer - Parr, SC	1984	644
I. C. Turbines:		
**Burton, SC	1961	0
**Faber Place – Charleston, SC	1961	0
**Hardeeville, SC	1968	0
Urquhart – Beech Island, SC	1969	39
Coit – Columbia, SC	1969	28
Parr, SC	1970	60
Williams – Goose Creek, SC	1972	40
Hagood – Charleston, SC	1991	88
Urquhart No. 4 – Beech Island, SC	1999	48
Urquhart Combined Cycle – Beech Island, SC	2002	460
Jasper Combined Cycle – Jasper, SC	2004	857
Total I. C. Turbines Capacity		1620
Hydro:		
Neal Shoals – Carlisle, SC	1905	2
Parr Shoals – Parr, SC	1914	7
Stevens Creek - Near Martinez, GA	1914	9
*Columbia Canal - Columbia, SC	1927	3
Saluda - Near Irmo, SC	1930	200
Fairfield Pumped Storage - Parr, SC	1978	576
Total Hydro Capacity		797
Other: Long-Term Purchases		25
SEPA		33
Grand Total:		5,684

* Williams Station is owned by GENCO, a wholly owned subsidiary of SCANA and Columbia Canal is owned by the City of Columbia. This capacity is operated by SCE&G. ** Burton (27 MW) and Faber Place (8 MW) gas turbine units and Hardeeville (11 MW) an oil turbine unit are currently in non-run status and will be unavailable indefinitely. Two 17 MW un-sited ICTs, not reflected above, will be added sometime in 2009.

Environmental Considerations:

In March 2005, the United States Environmental Protection Agency ("EPA") issued a final rule known as the Clean Air Interstate Rule ("CAIR"). CAIR required that the District of Columbia and twenty-eight states, including South Carolina, reduce sulfur dioxide ("SO_2") and nitrogen oxide ("NOx") emissions in order to attain mandated air quality levels. CAIR established emission limits to be met in two phases beginning in 2009 and 2015, respectively for NOx and 2010 and 2015, respectively for SO_2. In addition, the EPA required some states to enact a State Implementation Plan designed to address air quality issues. The South Carolina State Implementation Plan (the "Plan") required, among other things, the reduction of SO_2 emissions from coal-fired generating facilities. The Plan also required a reduction in NOx emissions in the months of May through September until 2009 when the CAIR limits would become effective. CAIR and the Plan directly impacted SCE&G. As a result of CAIR and the Plan and to meet its compliance requirements, SCE&G installed Selective Catalytic Reduction ("SCR") equipment at its Cope Station in the Fall of 2008. The SCR began full time operation on January 1, 2009 and has run well since that time. It is capable of reducing NOx emissions at the Cope Station by approximately 90%. SCE&G is also utilizing the existing SCRs at Williams and Wateree Station along with previously installed low NOx burner installations at the other coal fired units to meet the CAIR requirements. Additionally, SCE&G is in the process of installing flue gas desulfurization (FGD) equipment, commonly known as wet scrubbers, at Wateree and Williams Station to reduce SO_2 emissions. These projects are currently on schedule. The scrubbers should be on line and tested during the summer and fall of 2009 with the goal of commercial operation of the equipment by January 1, 2010. There will be some reduction in mercury as a result of the wet scrubber installations also. The reductions in emissions resulting from the installation of the SCR's and the wet scrubbers will be a great benefit to the environment of South Carolina. Furthermore, the Company believes that there are significant environmental benefits to be achieved through SO_2 and NOx emissions and that this equipment will be critical to meeting future regulatory requirements.

Planning Reserve Margin and Operating Reserves

The Company provides for the reliability of its electric service by maintaining an adequate reserve margin of supply capacity. The appropriate level of reserve capacity for SCE&G is in the range of 12 to 18 percent of its firm peak demand. This range of reserves will allow SCE&G to have adequate daily operating reserves and to have reserves to cover two primary sources of risk: supply risk and demand risk. Mitigation of these two types of risk is discussed below.

Supply reserves are needed to balance the "supply risk" that some SCE&G generation capacity may be forced out of service or its capacity reduced on any particular day because of mechanical failures, wet coal problems, environmental limitations or other force majeure/unforeseen events. The amount of capacity forced-out or down-rated will vary from day to day. SCE&G's reserve margin range is designed to cover most of these days as well as the outage of any one of our generating units except the two largest: Summer Station and Williams Station.

Another component of reserve margin is the demand reserve. This is needed to cover "demand risk" related to unexpected increases in customer load above our peak demand forecast. This can be the result of extreme weather conditions or forecast error.

The level of daily operating reserves required by the SCE&G system is dictated by operating agreements with other VACAR companies. VACAR has set the region's reserve needs at 150% of the largest unit in the region. While it varies by a megawatt or two each year, SCE&G's pro-rata share of this capacity is always around 200 megawatts.

By maintaining a reserve margin in the 12 to 18 percent range, the Company addresses the uncertainties related to load and to the availability of generation on its system. It also allows the Company to meet its VACAR obligation. SCE&G will monitor its reserve margin policy in light of the changing power markets and its system needs and will make changes to the policy as warranted.

Nuclear Capacity and Its Advantages

On May 30, 2008 SCE&G filed an application with the South Carolina Public Service Commission to receive permission to construct and operate two nuclear units of 1,117 net MWs each. A hearing was held in December 2008 under Docket No. 2008-196-E and on February 11, 2009, the Commission voted to approve the company's request. Subsequently The Commission issued Order No. 2009-104.Both units will have the Westinghouse AP1000 design and use passive safety systems to enhance the safety of the units. The first unit is planned for 2016 and the second for 2019. SCE&G will own 55% of the units (614 MWs each) while Santee Cooper will own 45%. SCE&G and Santee Cooper have an application pending before the Nuclear

Regulatory Commission (NRC) for a combined construction and operating license (COL). The application was filed on March 31, 2008 and the NRC is expected to rule in late 2011 or early 2012.

While volumes of information and testimony were analyzed in the regulatory process, the need for baseload capacity, the benefits of increased fuel diversity and the increasingly stringent environmental regulations were among the primary factors driving the company to add nuclear capacity. The last baseload unit added to the SCE&G system was Cope Station in 1996. After its addition, the percentage of baseload capacity on the system was about 74% while currently it is only 56%. With the addition of these two nuclear units, the percentage of baseload capacity will be about 63%. Regarding fuel diversity, the current mix of capacity is 11% nuclear, 43% coal and 30% natural gas. With the addition of this nuclear capacity, the mix will be 27% nuclear, 37% coal and 24% natural gas. Finally since nuclear power is a non-emitting resource, the Company's emission of carbon dioxide, sulfur dioxide, nitrous oxide and mercury will be greatly reduced from a resource plan without additional nuclear capacity.

Non-Traditional Generation Sources - Renewables and CO_2

SCE&G continues to monitor the variety of federal bills that, if enacted, will mandate a federal renewable portfolio standard (RPS). Also monitored are those federal bills that may limit or cap CO_2 emissions. One of the primary purposes of a federal RPS is to increase the amount of clean energy produced in the US. In a recent draft of RPS legislation retail sales are adjusted down by hydro generation before a minimum renewable requirement is applied. Qualified renewable sources typically include new or recently added solar, wind, geothermal energy, ocean energy, biomass, landfill gas, and incremental hydro. The most abundant renewable energy source in SC is woody biomass. On-shore wind is insufficient to produce significant energy. Off-shore wind power and solar power are expensive. Renewable energy requirements included in draft legislation would require 20% of generation from renewable sources by 2020. This would be very difficult in SC. In December 2008 there were nine Climate Change bills identified. It is not known whether any of these will ultimately be passed by Congress. Each attempts to reduce the total CO2 emitted to levels much below current levels by 2050.

The following table shows the amount of clean energy generated by SCE&G in 2008. Renewable energy provided 2.2% of SCE&G's 2008 load. Clean energy represented 23% of SCE&G's 2008 load. SCE&G has applied with Green-e to obtain renewable energy certificates (RECs) for our biomass energy.

Clean Energy Generated by SCE&G in 2008	
Type	MWhs
Biomass	369,780
Hydro	136,736
Nuclear	4,785,376
Total	5,291,892

Near Term Capacity Needs

In the years prior to the addition of the first nuclear unit in 2016, SCE&G's capacity deficit will range from 100 MWs up to 325 MWs. SCE&G expects to meet this need with a combination of demand-side programs, renewable resources and purchased capacity. As previously discussed, SCE&G is currently conducting a comprehensive assessment of DSM potential and will have results in a few months. The Company is also studying ways to increase its renewable power generation. Finally SCE&G expects to issue a "Request for Proposal", an RFP, to purchase capacity in the market.

Projected Loads and Resources

The "Resource Plan Table" on page 23 shows SCE&G's projected loads and resources for the next 15 years. The resource plan shows the need for additional capacity and identifies, at least, on a preliminary basis whether the need is for peaking/intermediate capacity or baseload capacity. It should be noted that line 11 in the table labeled "Firm Annual Purchase" represents a capacity deficit in the plan and not a decision by SCE&G to purchase this capacity. As discussed previously, the Company hopes to meet some of this capacity deficit with additional DSM and renewable power. In this sense SCE&G considers the plan shown here as "the plan to beat".

Lines 7-9 in the Resource Plan Table indicates expected changes in SCE&G's long-term supply. The following table explains these changes.

Changes in Long-Term Supply		
2009	-19 MW	-17 MW SEPA; -2 MW Cope SCR
2010	34 MW	Add 2 Hagood Turbines (@17 MW)
	-39 MW	-13 MW SEPA; -26 MW Scrubbers at Wateree & Williams
2016	614 MW	Nuclear Unit #2
2019	614 MW	Nuclear Unit #3
2023	93 MW	New ICT

The Company believes that its supply plan, summarized in the following table, will be as benign to the environment as possible because of the Company's continuing efforts to utilize state-of-the-art emission reduction technology in compliance with state and federal laws and regulations. The supply plan will also help SCE&G keep its cost of energy service at a minimum since the generating units being added are competitive with other units being added in the market.

SCE&G Forecast of Summer Loads and Resources - 2009 Budget and 2009 IRP

	YEAR	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Load Forecast																
1	Gross Territorial Peak	4924	4947	5131	5242	5342	5443	5544	5645	5750	5852	5952	6055	6164	6276	6394
2	Less: DSM	202	200	200	200	200	200	200	200	200	200	200	200	200	200	200
3	Net Territorial Peak	4722	4747	4931	5042	5142	5243	5344	5445	5550	5652	5752	5855	5964	6076	6194
4	Firm Contract Sales	250	250	250	250											
5	Total Firm Obligation	4972	4997	5181	5292	5142	5243	5344	5445	5550	5652	5752	5855	5964	6076	6194
System Capacity																
6	Existing	5684	5665	5660	5660	5660	5660	5660	5660	6274	6274	6274	6888	6888	6888	6888
	Additions															93
7	Peaking/Intermediate		34													
8	Baseload								614			614				
9	Other	-19	-39													
10	Total System Capacity	5665	5660	5660	5660	5660	5660	5660	6274	6274	6274	6888	6888	6888	6888	6981
11	Firm Annual Purchase			150	275	100	225	325			75					
12	Total Production Capability	5665	5660	5810	5935	5760	5885	5985	6274	6274	6349	6888	6888	6888	6888	6981
Reserves With DSM																
13	Margin	693	663	629	643	618	642	641	829	724	697	1136	1033	924	812	787
14	% Reserve Margin	13.9%	13.3%	12.1%	12.2%	12.0%	12.2%	12.0%	15.2%	13.0%	12.3%	19.7%	17.6%	15.5%	13.4%	12.7%
15	% Capacity Margin	12.2%	11.7%	10.8%	10.8%	10.7%	10.9%	10.7%	13.2%	11.5%	11.0%	16.5%	15.0%	13.4%	11.8%	11.3%
Reserves Without DSM																
16	Margin	491	463	429	443	418	442	441	629	524	497	936	833	724	612	587
17	% Reserve Margin	9.5%	8.9%	8.0%	8.1%	7.8%	8.1%	8.0%	11.1%	9.1%	8.5%	15.7%	13.8%	11.7%	9.8%	9.2%
18	% Capacity Margin	8.7%	8.2%	7.4%	7.5%	7.3%	7.5%	7.4%	10.0%	8.4%	7.8%	13.6%	12.1%	10.5%	8.9%	8.4%

Transmission Planning

SCE&G's transmission planning practices develop and coordinate a program that provides for timely modifications to the SCE&G transmission system to ensure a reliable and economical delivery of power. This program includes the determination of the current capability of the electrical network and a ten-year schedule of future additions and modifications to the system. These additions and modifications are required to support customer growth, provide emergency assistance and maintain economic opportunities for our customers while meeting SCE&G and industry transmission performance standards.

SCE&G has an ongoing process to determine the current and future performance level of the SCE&G transmission system. Numerous internal studies are undertaken that address the service needs of our customers. These needs include: 1) distributed load growth of existing residential, commercial, industrial, and wholesale customers, 2) new residential, commercial, industrial, and wholesale customers and 3) customers who use only transmission service on the SCE&G system.

SCE&G has developed and adheres to a set of internal Long Range Planning Criteria which can be summarized as follows:

> *The requirements of the SCE&G "LONG RANGE PLANNING CRITERIA" will be satisfied if the system is designed so that during any of the following contingencies, only short-time overloads, low voltages and local loss of load will occur and that after appropriate switching and re-dispatching, all non-radial load can be served with reasonable voltages and that lines and transformers are operating within acceptable limits.*
>
> a. *Loss of any bus and associated facilities operating at a voltage level of 115kV or above*
> b. *Loss of any line operating at a voltage level of 115kV or above*
> c. *Loss of entire generating capability in any one plant*
> d. *Loss of all circuits on a common structure*
> e. *Loss of any transmission transformer*
> f. *Loss of any generating unit simultaneous with the loss of a single transmission line*
>
> *Outages more severe are considered acceptable if they will not cause equipment damage or result in uncontrolled cascading outside the local area.*

Furthermore, SCE&G subscribes to the set of mandatory Electric Reliability Organization (ERO), also known as the North American Electric Reliability Corporation (NERC), Reliability Standards for Transmission Planning, as approved by the NERC Board of Trustees and the FERC. SCE&G tests and designs its transmission system to be compliant with the requirements as set forth in these standards. A copy of the NERC Reliability Standards is available at the NERC website http://www.nerc.com/.

The SCE&G transmission system is interconnected with Progress Energy – Carolinas, Duke Energy, South Carolina Public Service Authority (Santee Cooper), Georgia Power (Southern Company) and the Southeastern Electric Power Administration (SEPA) systems. Because of this, system conditions on other systems can affect the capabilities of the SCE&G transmission system and also system conditions on the SCE&G transmission system can affect other systems. SCE&G participates with other transmission owners throughout the southeast to develop current and future power flow and stability models of the integrated transmission grid for the NERC Eastern Interconnection. All participants' models are merged together to produce current and future models of the integrated electrical network. Using these models, SCE&G evaluates its current and future transmission system for compliance with the SCE&G Long Range Planning Criteria and the NERC Reliability Standards.

To ensure the reliability of the SCE&G transmission system while considering conditions on other systems and to assess the reliability of the integrated transmission grid, SCE&G participates in assessment studies with neighboring transmission owners in South Carolina, North Carolina and Virginia. SCE&G also, on an annual basis, participates with other transmission owners throughout the southeast to assess the reliability of the southeastern integrated transmission grid for the long-term horizon (up to 10 years) and for upcoming seasonal (summer and winter) system conditions.

The following is a list of joint studies with neighboring transmission owners completed over the past year:

1. 2008 January OASIS Study
2. 2008 April OASIS Study
3. 2008 July OASIS Study
4. 2008 October OASIS Study
5. 2008 Summer Reliability Study
6. 2008/09 Winter Reliability Study
7. SERC East / RFC 2008 Summer Study
8. 2015 Summer VACAR Study
9. 2011 Summer 2008 Study
10. VACAR 2008 Drought Study
11. SERC 2008 Summer Drought Study
12. VACAR Stability Study of Projected 2008 Light Load Conditions

These activities, as discussed above, provide for a reliable and cost effective transmission system for SCE&G customers.

FERC Order 890 – Attachment K (Transmission Planning)

On March 15, 2007 the Federal Energy Regulatory Commission (FERC) published in the Federal Register a final rule reforming the 1996 open-access transmission regulatory framework rules in Orders No. 888 and 889. This final rule, called FERC Order No. 890, was adopted by FERC on February 15, 2007 and is designed to "prevent undue discrimination and preference in transmission service". Among other requirements, this order requires transmission providers to establish an open, transparent and coordinated transmission planning process that includes FERC jurisdictional stakeholder involvement. SCE&G and the South Carolina Public Service Authority (Santee Cooper) have jointly established the South Carolina Regional Transmission Planning (SCRTP) process to meet the requirements of FERC Order No. 890. Documentation of this process was filed with the FERC on December 7, 2007 in the form of Attachment K to the SCE&G Open Access Transmission Tariff (OATT). Activities associated with this process can be reviewed and followed at the SCRTP website (www.scrtp.com).

Appendix A

Short Range Methodology

This section presents the development of the short-range electric sales forecasts for the Company. Two years of monthly forecasts for electric customers, average usage, and total usage were developed according to company class and rate structures, with industrial customers further classified into SIC (Standard Industrial Classification) codes. Residential customers were classified by housing type (single family, multi-family, and mobile homes) and by whether or not they use electric space heating. For each forecasting group, the number of customers and either total usage or average usage was estimated for each month of the forecast period.

The short-range methodologies used to develop these models were determined primarily by available data, both historical and forecast. Monthly sales data by class and rate are generally available historically. Monthly heating and cooling degree data for Columbia and Charleston are also available historically, and may be forecast using averages based on NOAA normals[1]. Industrial production indices are also available by SIC on a quarterly basis, and can be transformed to a monthly series. Therefore, sales, weather, industrial production indices, and time dependent variables were used in the short range forecast. In general, the forecast groups fall into two classifications, weather sensitive and non-weather sensitive. For the weather sensitive classes, regression analysis was the methodology used, while for the non-weather sensitive classes regression analysis or time series models based on the autoregressive integrated moving average (ARIMA) approach of Box-Jenkins were used.

The short range forecast developed from these methodologies was also adjusted for marketing programs, new industrial loads, terminated contracts, or economic factors as discussed in Section 3.

Regression Models

Regression analysis is a method of developing an equation which relates one variable, such as usage, to one or more other variables which help explain fluctuations and trends in the first. This method is mathematically constructed so that the resulting combination of explanatory variables produces the smallest squared error between the historic actual values and those estimated by the regression. The output of the regression analysis provides an equation for the variable being explained. Several statistics which indicate the success of the regression analysis fit are shown for each model. Several of these indicators are R^2, Root Mean Squared Error, Durbin-Watson Statistic, F-Statistic, and the T-Statistics of the Coefficient. PROC REG of SAS[2] was used to estimate all regression models. PROC AUTOREG of SAS was used if significant autocorrelation, as indicated by the Durbin-Watson statistic, was present in the model.

Two variables were used extensively in developing weather sensitive average use models: heating degree days (HDD) and cooling degree days (CDD). The values for HDD and CDD are the average of the values for Charleston and Columbia. The base for HDD was 60° and for CDD was 75°. In order to account for cycle billing, the degree day values for each day were weighted by the number of billing cycles which included that day for the current month's billing. The daily weighted degree day values were summed to obtain monthly degree day values. Billing sales for a calendar month may actually reflect consumption that occurred in the previous month based on weather conditions in that period and also consumption occurring in the current month. Therefore, this method should more accurately reflect the impact of weather variations on the consumption data.

The development of average use models began with plots of the HDD and CDD data versus average use by month. This process led to the grouping of months with similar average use patterns. Summer and winter groups were chosen, with the summer models including the months of May through October, and the winter models including the months of November through April. For each of the groups, an average use model was developed. Total usage models were developed with a similar methodology for the municipal and cooperative customers. For these customers, HDD and CDD were weighted based on Cycle 20 distributions. This is the last reading date for bills in any given month, and is generally used for larger customers.

The plots also revealed significant changes in average use over time. Three types of variables were used to measure the effect of time on average use:

1. Number of months since a base period;
2. Dummy variable indicating before or after a specific point in time; and,
3. Dummy variable for a specific month or months.

Some models revealed a decreasing trend in average use, which is consistent with conservation efforts and improvements in energy efficiency. However, other models showed an increasing average use over time. This could be the result of larger houses, increasing appliance saturations, lower real electricity prices, and/or higher real incomes.

ARIMA Models

Autoregressive integrated moving average (ARIMA) procedures were used in developing the short range forecasts. For various class/rate groups, they were used to develop customer estimates, average use estimates, or total use estimates.

ARIMA procedures were developed for the analysis of time series data, i.e., sets of observations generated sequentially in time. This Box-Jenkins approach is based on the assumption that the behavior of a time series is due to one or more identifiable influences. This method recognizes three effects that a particular observation may have on subsequent values in the series:

1. A decaying effect leads to the inclusion of autoregressive (AR) terms;

2. A long-term or permanent effect leads to integrated (I) terms; and,

3. A temporary or limited effect leads to moving average (MA) terms.

Seasonal effects may also be explained by adding additional terms of each type (AR, I, or MA).

The ARIMA procedure models the behavior of a variable that forms an equally spaced time series with no missing values. The mathematical model is written:

$$Z_t = u + Y_i\ (B)\ X_{i,t} + q\ (B)/\ f\ (B)\ a_t$$

This model expresses the data as a combination of past values of the random shocks and past values of the other series, where:

t	indexes time
B	is the backshift operator, that is $B\ (X_t) = X_{t-1}$
Z_t	is the original data or a difference of the original data
f(B)	is the autoregressive operator, $f(B) = 1 - f_1 B - \ldots - f_1 B^p$
u	is the constant term
q(B)	is the moving average operator, $q\ (B) = 1 - q_1 B - \ldots - q_q B^q$
a_t	is the independent disturbance, also called the random error
$X_{i,t}$	is the ith input time series
$y_i(B)$	is the transfer function weights for the ith input series (modeled as a ratio of polynomials)
$y_i(B)$	is equal to $w_i\ (B)/\ d_i\ (B)$, where $w_i\ (B)$ and $d_i\ (B)$ are polynomials in B.

The Box-Jenkins approach is most noted for its three-step iterative process of identification, estimation, and diagnostic checking to determine the order of a time series. The autocorrelation and partial autocorrelation functions are used to identify a tentative model for univariate time series. This tentative model is estimated. After the tentative model has been fitted to the data, various checks are performed to see if the model is appropriate. These checks involve analysis of the residual series created by the estimation process and often lead to refinements in the tentative model. The iterative process is repeated until a satisfactory model is found.

Many computer packages perform this iterative analysis. PROC ARIMA of (SAS/ETS)[3] was used in developing the ARIMA models contained herein.

The attractiveness of ARIMA models comes from data requirements. ARIMA models utilize data about past energy use or customers to forecast future energy use or customers. Past history on energy use and customers serves as a proxy for all the measures of factors underlying energy use and customers when other variables were not available. Univariate ARIMA models were used to forecast average use or total usage when weather-related variables did not significantly affect energy use or alternative independent explanatory variables were not available.

Footnotes

1. The 15-year average daily weather "normals" were based on data from 1993 to 2007 published by the National Oceanic and Atmospheric Association.

2. SAS Institute, Inc., SAS/STAT[tm] Guide for Personal Computers, Version 6 Edition. Cary, NC: SAS Institute, Inc., 1987.

3. SAS Institute, Inc., SAS/ETS User's Guide, Version 6, First Edition. Cary, NC: SAS Institute, Inc., 1988.

Electric Sales Assumptions

For short-term forecasting, over 30 forecasting groups were defined using the Company's customer class and rate structures. Industrial (Class 30) Rate 23 was further divided using SIC codes. In addition, twenty-seven large industrial customers were individually projected. The residential class was disaggregated into those customers with electric space heating and those without electric space heating and by housing type (single family, multi-family, and mobile homes). Each municipal and cooperative account represents a forecasting group and were also individually forecast. Discussions were held with Industrial Marketing and Economic Development representatives within the company regarding prospects for industrial expansions or new customers, and adjustments made to customer, rate, or account projections where appropriate. Table 1 contains the definition for each group and Table 2 identifies the methodology used and the values forecasted by forecasting groups.

The forecast for Company Use is based on historic trends and adjusted for Summer nuclear plant outages. Unaccounted for energy, which is the difference between generation and sales and represents for the most part system losses, is usually about 4.4% of total territorial sales. The monthly allocations for unaccounted for were based on a regression model using normal total degree-days for the calendar month and total degree-days weighted by cycle billing. Adding company use and unaccounted for to monthly territorial sales produces electric generation requirements

TABLE 1
Short-Term Forecasting Groups

Class Number	Class Name	Rate/SIC Designation	Comment
10	Residential Non-Space Heating	Single Family	Rates 1, 2, 5, 6, 8, 18, 25, 26, 62, 64
		Multi Family	67, 68, 69
910	Residential Space Heating	Mobile Homes	
20	Commercial Non-Space Heating	Rate 9	Small General Service
		Rate 12	Churches
		Rate 20, 21	Medium General Service
		Rate 22	Schools
		Rate 24	Large General Service
		Other Rates	10, 11, 14, 16, 17, 18, 24, 25, 26, 27, 29, 62, 64, 67, 69
920	Commercial Space Heating	Rate 9	Small General Service
30	Industrial Non-Space Heating	Rate 9	Small General Service
		Rate 20, 21	Medium General Service
		Rate 23, SIC 22	Textile Mill Products
		Rate 23, SIC 24	Lumber, Wood Products, Furniture and Fixtures (SIC Codes 24 and 25)
		Rate 23, SIC 26	Paper and Allied Products
		Rate 23, SIC 28	Chemical and Allied Products
		Rate 23, SIC 30	Rubber and Miscellaneous Products
		Rate 23, SIC 32	Stone, Clay, Glass, and Concrete
		Rate 23, SIC 33	Primary Metal Industries; Fabricated Metal Products; Machinery; Electric and Electronic Machinery, Equipment and Supplies; and Transportation Equipment (SIC Codes 33-37)
		Rate 23, SIC 99	Other or Unknown SIC Code*
		Rate 24, 27, 60	Large General Service
		Other	Rates 18, 25, and 26
60	Street Lighting	Rates 3, 9, 13, 17, 18, 25, 26, 29, and 69	
70	Other Public Authority	Rates 3, 9, 20, 25, 26, 29, 65 and 66	
92	Municipal	Rate 60, 61	Four Individual Accounts
97	Cooperative	Rate 60	One Account

*Includes small industrial customers from all SIC classifications that were not previously forecasted individually. Industrial Rate 23 also includes Rate 24. Commercial Rate 24 also includes Rate 23.

TABLE 2

Summary of Methodologies Used To Produce
The Short Range Forecast

Value Forecasted	Methodology	Forecasting Groups
Average Use	Regression	Class 10, All Groups Class 910, All Groups Class 20, Rates 9, 12, 20, 22, 24, 99 Class 920, Rate 9 Class 70, Rate 3
Total Usage	ARIMA/ Regression	Class 30, Rates 9, 20, 99, and 23, for SIC = 91 and 99 Class 930, Rate 9 Class 60 Class 70, Rates 65, 66
	Regression	Class 92, All Accounts Class 97, All Accounts
Customers	ARIMA	Class 10, All Groups Class 910, All Groups Class 20, All Rates Class 920, Rate 9 Class 30, All Rates Except 60, 99, and 23 for SIC = 22, 24, 26, 28, 30, 32, 33, and 91 Class 930, Rate 9 Class 60 Class 70, Rate 3

Appendix B

Long Range Sales Forecast

Electric Sales Forecast

This section presents the development of the long-range electric sales forecast for the Company. The long-range electric sales forecast was developed for seven classes of service: residential, commercial, industrial, street lighting, other public authorities, municipal and cooperatives. These classes were disaggregated into appropriate subgroups where data was available and there were notable differences in the data patterns. The residential, commercial, and industrial classes are considered the major classes of service and account for over 90% of total territorial sales. A customer forecast was developed for each major class of service. For the residential class, forecasts were also produced for those customers with electric space heating and for those without electric space heating. They were further disaggregated into housing types of single family, multi-family and mobile homes. In addition, two residential classes and residential street lighting were evaluated separately. These subgroups were chosen based on available data and differences in the average usage levels and/or data patterns. The industrial class was disaggregated into two digit SIC code classification for the large general service customers, while smaller industrial customers were grouped into an "other" category. These subgroups were chosen to account for the differences in the industrial mix in the service territory. With the exception of the residential group, the forecast for sales was estimated based on total usage in that class of service. The number of residential customers and average usage per customer were estimated separately and total sales were calculated as a product of the two.

The forecast for each class of service was developed utilizing an econometric approach. The structure of the econometric model was based upon the relationship between the variable to be forecasted and the economic environment, weather, conservation, and/or price.

Forecast Methodology

Development of the models for long-term forecasting was econometric in approach and used the technique of regression analysis. Regression analysis is a method of developing an equation, which relates one variable, such as sales or customers, to one or more other variables that are statistically correlated with the first, such as weather, personal income or population growth. Generally, the goal is to find the combination of explanatory variables producing the smallest error between the historic actual values and those estimated by the regression. The output of the regression analysis provides an equation for the variable being explained. In the equation, the variable being explained equals the sum of the explanatory variables each multiplied by an estimated coefficient. Various statistics, which indicate the success of the regression analysis fit, were used to evaluate each model. The indicators were R^2, mean squared Error of the Regression, Durbin-Watson Statistic and the T-Statistics of the Coefficient. PROC STEPWISE, PROC REG, and PROC AUTOREG of SAS were used to estimate all regression models. PROC STEPWISE was used for preliminary model specification and elimination of insignificant variables. PROC REG was used for the final model specifications. Model development also included residual analysis for incorporating dummy variables and an analysis of how well the models fit the historical data, plus checks for any statistical problems such as autocorrelation or multicollinearity. PROC AUTOREG was used if autocorrelation was present as indicated by the Durbin-Watson statistic. Prior to developing the long-range models, certain design decisions were made:

- The multiplicative or double log model form was chosen. This form allows forecasting based on growth rates, since elasticities with respect to each explanatory variable are given directly by their respective regression coefficients. Elasticity explains the responsiveness of changes in one variable (e.g. sales) to changes in any other variable (e.g. price). Thus, the elasticity coefficient can be applied to the forecasted growth rate of the explanatory variable to obtain a forecasted growth rate for a dependent variable. These forecasted growth rates were then applied to the last year of the short range forecast to obtain the forecast level for customers or sales for the long range forecast. This is a constant elasticity model, therefore, it is important to evaluate the reasonableness of the model coefficients.

- One way to incorporate conservation effects on electricity is through real prices, or time trend variables. Models selected for the major classes would include these variables, if they were statistically significant.
- The remaining variables to be included in the models for the major classes would come from four categories:
  1. Demographic variables - Population.
  2. Measures of economic well-being or activity: real personal income, real per capita income, employment variables, and industrial production indices.
  3. Weather variables - average summer/winter temperature or heating and cooling degree-days.
  4. Variables identified through residual analysis or knowledge of political changes, major economics events, etc. (e.g., foreign oil price increases in 1979 and recession versus non-recession years).

Standard statistical procedures (all possible regressions, stepwise regression) were used to obtain preliminary specifications for the models. Model parameters were then estimated using historical data and competitive models were evaluated on the basis of:

- Residual analysis and traditional "goodness of fit" measures to determine how well these models fit the historical data and whether there were any statistical problems such as autocorrelation or multicollinearity.
- An examination of the model results for the most recently completed full year.

- An analysis of the reasonableness of the long-term trend generated by the models. The major criteria here was the presence of any obvious problems, such as the forecasts exceeding all rational expectations based on historical trends and current industry expectations.
- An analysis of the reasonableness of the elasticity coefficient for each explanatory variable. Over the years a host of studies have been conducted on various elasticities relating to electricity sales. Therefore, one check was to see if the estimated coefficients from Company models were in-line with others. As a result of the evaluative procedure, final models were obtained for each class.
- The drivers for the long-range electric forecast included the following variables.

Service Area Population
Service Area Real Per Capita Income
Service Area Real Personal Income
State Industrial Production Indices
Real Price of Electricity
Average Summer Temperature
Average Winter Temperature
Heating Degree Days
Cooling Degree Days

The service area data included Richland, Lexington, Berkeley, Dorchester, Charleston, Aiken and Beaufort counties, which account for the vast majority of total territorial electric sales. Service area historic data and projections were used for all classes with the exception of the industrial class. Industrial productions indices were only available on a statewide basis, so forecasting relationships were developed using that data. Since industry patterns are generally based on regional and national economic patterns, this linking of Company industrial sales to a larger geographic index was appropriate.

Economic Assumptions

In order to generate the electric sales forecast, forecasts must be available for the independent variables. The forecasts for the economic and demographic variables were obtained from Global Insight, Inc., (formerly DRI-WEFA) and the forecasts for the price and weather variables were based on historical data. The trend projection developed by Global Insight is characterized by slow, steady growth, representing the mean of all possible paths that the economy could follow if subject to no major disruptions, such as substantial oil price shocks, untoward swings in policy, or excessively rapid increases in demand.

Average summer temperature or CDD (Average of June, July, and August temperature) and average winter temperature or HDD (Average of December (previous year), January and February temperature) were assumed to be equal to the normal values used in the short range forecast.

Peak Demand Forecast

This section describes the procedures used to create the long-range summer and winter peak demand forecasts. It also describes the methodology used to forecast monthly peak demands. Development of summer peak demands will be discussed initially, followed by the construction of winter peaks.

Summer Peak Demand

The forecast of summer peak demands was developed with a load factor methodology. This methodology may be characterized as a building-block approach because class, rate, and some individual customer peaks are separately determined and then summed to derive the territorial peak.

Briefly, the following steps were used to develop the summer peak demand projections. Load factors for selected classes and rates were first calculated from historical data and then used to estimate peak demands from the projected energy consumption among these categories. Next, planning peaks were determined for a number of large industrial customers. The demands of these customers were forecasted individually. Summing these class, rate, and individual customer demands provided the forecast of summer territorial peak demand. Next, the incremental reductions in demand resulting from the Company's standby generator and interruptible programs were subtracted from the peak demand forecast. This calculation gave the firm summer territorial peak demand, which was used for planning purposes.

Load Factor Development

As mentioned above, load factors are required to calculate KW demands from KWH energy. This can be seen from the following equation, which shows the relationship between annual load factors, energy, and demand:

$$\textit{Load Factor} = \textit{Energy}/(\textit{Demand} \times 8760)$$

The load factor is thus seen to be a ratio of total energy consumption relative to what it might have been if the customer had maintained demand at its peak level throughout the year. The value of a load factor will usually range between 0 and 1, with lower values indicating more variation in a customer's consumption patterns, as typified by residential users with relatively large space-conditioning loads. Conversely, higher values result from more level demand patterns throughout the year, such as those seen in the industrial sector.

Rearrangement of the above equation makes it possible to calculate peak demand, given energy and a corresponding load factor. This form of the equation is used to project peak demand herein. The question then becomes one of determining an appropriate load factor to apply to projected energy sales.

The load factors used for the peak demand forecast were not based on one-hour coincident peaks. Instead, it was determined that use of a 4-hour average class peak was more appropriate for forecasting purposes. This was true for two primary reasons. First, analysis of territorial peaks showed that all of the summer peaks had occurred between the hours of 2 and 6 PM. However, the distribution of these peaks between those four hours was fairly evenly spread. It was thus concluded that while the annual peak would occur during the 4-hour band, it would not be possible to say with a high degree of confidence during which hour it would happen.

Second, the coincident peak demand of the residential and commercial classes depended on the hour of the peak's occurrence. This was due to the former tending to increase over the 4-hour band, while the latter declined. Thus, load factors based on peaks occurring at, say, 2 PM, would be quite different from those developed for a 5 PM peak. It should also be noted that the class contribution to peak is quite stable for groups other than residential and commercial. This means that the 4-hour average class demand, for say, municipals, was within 2% of the 1-hour coincident peak. Consequently, since the hourly probability of occurrence was roughly equal for peak demand, it was decided that a 4-hour average demand was most appropriate for forecasting purposes.

The effect of system line losses were embedded into the class load factors so they could be applied directly to customer level sales and produce generation level demands. This was a convenient way of incorporating line losses into the peak demand projections.

Energy Projections

For those categories whose peak demand was to be projected from KWH sales, the next requirement was a forecast of applicable sales on an annual basis. These projections were utilized in the peak demand forecast construction. In addition, street light sales were excluded from forecast sales levels when required, since there is no contribution to peak demand from this type of sale.

Combining load factors and energy sales resulted in a preliminary, or unadjusted peak demand forecast by class and/or rate. The large industrial customers whose peak demands were developed separately were also added to this forecast.

Derivation of the planning peak required that the impact of demand reduction programs be subtracted from the unadjusted peak demand forecast. This is true because the capacity expansion plan is sized to meet the firm peak demand, which includes the reductions attributable to such programs.

Winter Peak Demand

To project winter peaks actual winter peak demands were correlated with two primary explanatory variables, total territorial energy and weather during the day of the winter peak's occurrence. Other dummy variables were also tested for inclusion in the model to account for unusual events, such as recessions or extremely cold winters, but the final model utilized the two variables named above.

The logic behind the choice of these variables as determinants of winter peak demand is straightforward. Over time, growth in total territorial load is correlated with economic growth and activity in SCE&G's service area, and as such may be used as a proxy variable for those economic factors, which cause winter peak demand to change. It should be noted that the winter peak for any given year by industry convention is defined as occurring after the summer peak for that year. The winter period for each year is December of that year, along with January and February of the following year. For example, the winter peak in 1968 of 962 MW occurred on December 11, 1968, while the winter peak for 1969 of 1,126 MW took place on January 8, 1970. In addition to economic factors, weather also causes winter peak demand to fluctuate, so the impact of this variable was measured by the average of heating degree days (HDD) experienced on the winter peak day in Columbia and Charleston. The presence of a weather variable reduces the bias, which would exist in the other explanatory variables' coefficients if weather were excluded from the regression model, given that the weather variable should be included. When the actual forecast of winter peak demand was calculated, the normal value of heating degree-days over the sample period was used. Finally, although the ratio of winter to summer peak demands fluctuated over the sample period, it did show an increase over time. A primary cause for this increasing ratio was growth in the number of electric space heating customers. Due to the introduction and rapid acceptance of heat pumps over the past three decades, space-heating residential customers increased from less than 5,000 in 1965 to almost 217,000 in 2004, a 10.2% annual growth rate. However, this growth slowed dramatically in the 1990's, so the expectation is that the ratio of summer to winter peaks will change slowly in the future.

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Supplemental Project Agreement

1. **Project Title, Agreement, Funder and Project Numbers:** This Supplemental Project Agreement applies to the Project entitled: **"Mercury and Selenium FGD Water Treatment Evaluation: 2009 Studies".** The Parties will reference the Supplemental Project Agreement number **TC 013995-12506** ("TC NO") and **Project ID No. (68340)** in all correspondence. The terms and conditions of the Master Agreement for EPRI Member Participation ("Master Agreement") between the Parties dated **January 30, 2006** are incorporated herein and govern all work hereunder.

2. **Contact Information:**

Contact	Name	Phone/Fax	Email
EPRI Project Manager:	Paul Chu	650-855-2812	pchu@epri.com
EPRI Contracts:	Adorina Tomeh	650-855-2876 / 1032	atomeh@epri.com
EPRI Account Executive:	Eric Bauman	410- 740-3455 / 4233	ebauman@epri.com
Member Contracts:	Wayne Caughman	803-217-9624 / 933-7163	wcaughman@scana.com
Member Project Manager:	Jean-Claude Younan	803-217-9617 / 933-7218	jyounan@scana.com

3. **Project Funding:**

FUNDS: YEAR/TYPE	-2008-	-2009-	-2010-	-2011-	TOTAL FUNDS
Member TC Funds	$27,050				$27,050
EPRI TC Match	$27,050				$27,050
Total Funding	$54,100				$54,100

4. **Project Objectives, Tasks and Deliverables:** See attached Exhibit 1, incorporated herein by reference.

5. **Invoicing:**

☐ Current year payment enclosed (This form is the invoice for the current year).

X Address invoices to: Jean-Claude Younan
South Carolina Electric and Gas Co.
MC K61
Columbia, SC 29218

Phone/Fax: 803-217-9617 / 933-7218
E-mail: jyounan@scana.com

ELECTRIC POWER RESEARCH INSTITUTE

IN WITNESS WHEREOF, the parties hereto have caused this Supplemental Project Agreement to be executed by their duly authorized representatives.

Electric Power Research Institute ("EPRI") PO Box 10412, Palo Alto CA 94303-0813 USA 3420 Hillview Ave., Palo Alto CA 94303-1395 USA Tel/Fax): 650-855-2876 / 1032 _____________________ / ___________ Authorized Signature for EPRI / Effective Date Adorina Tomeh / Contract Negotiator Printed Name of EPRI's Authorized Signatory / Title	South Carolina Electric & Gas Company ("Member") 1426 Main Street, MC 087 Columbia, SC 29218 Tel/Fax): 803-217-9624 / 933-7163 _____________________ / ___________ Authorized Signature for Member / Date James M. Landreth / Vice President – Fossil Hydro Opns Printed Name of Member's Authorized Signatory / Title

ENDORSEMENT: EPRI is hereby authorized to release Tailored Collaboration Matching Funds from the account of South Carolina Electric & Gas Company as set forth in this Agreement.

By: ______________________ ______________

Wayne Caughman, METT Date