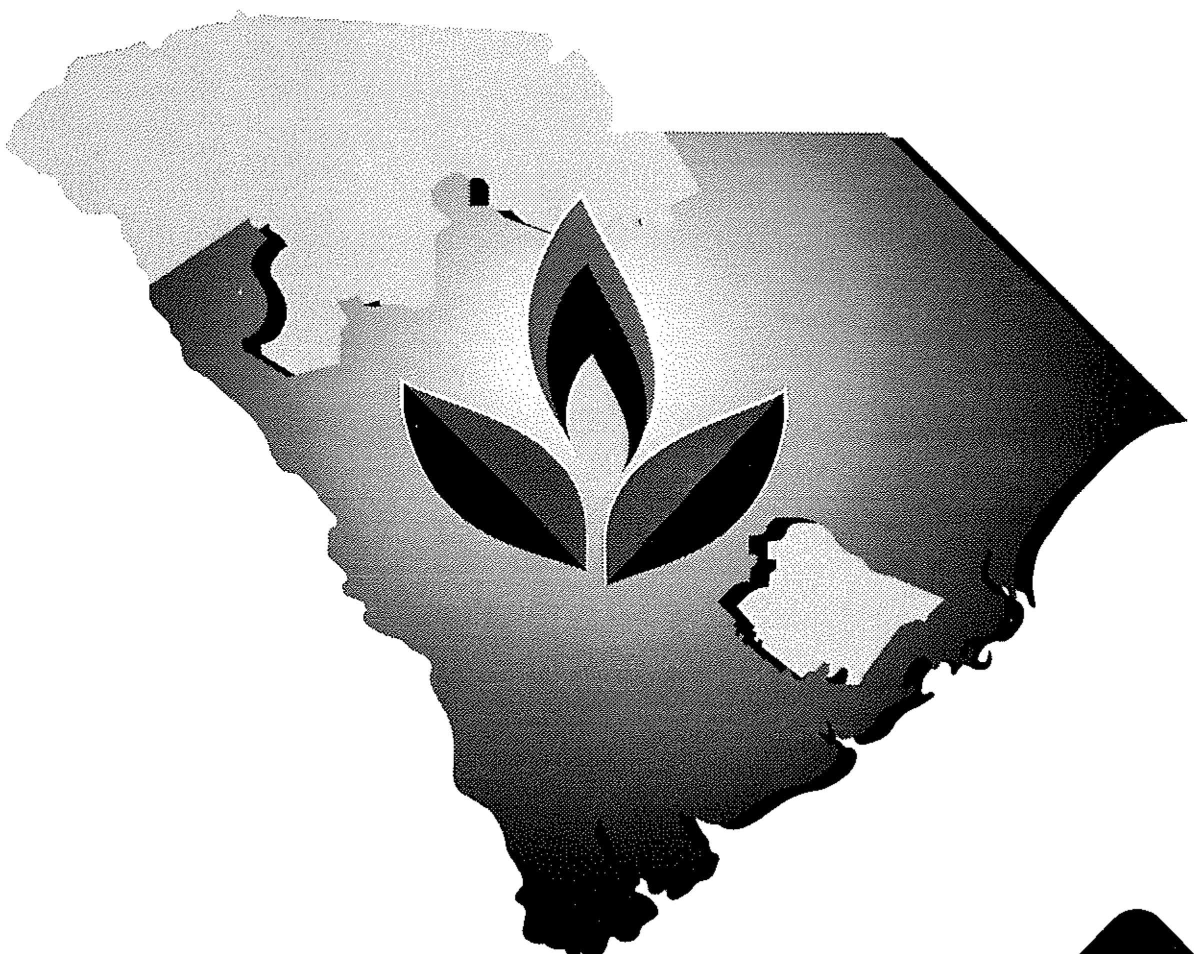
Gas Integrated Resource Plan

October, 1994



SCE&G
A SCANA Company

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Executive Summary

Introduction

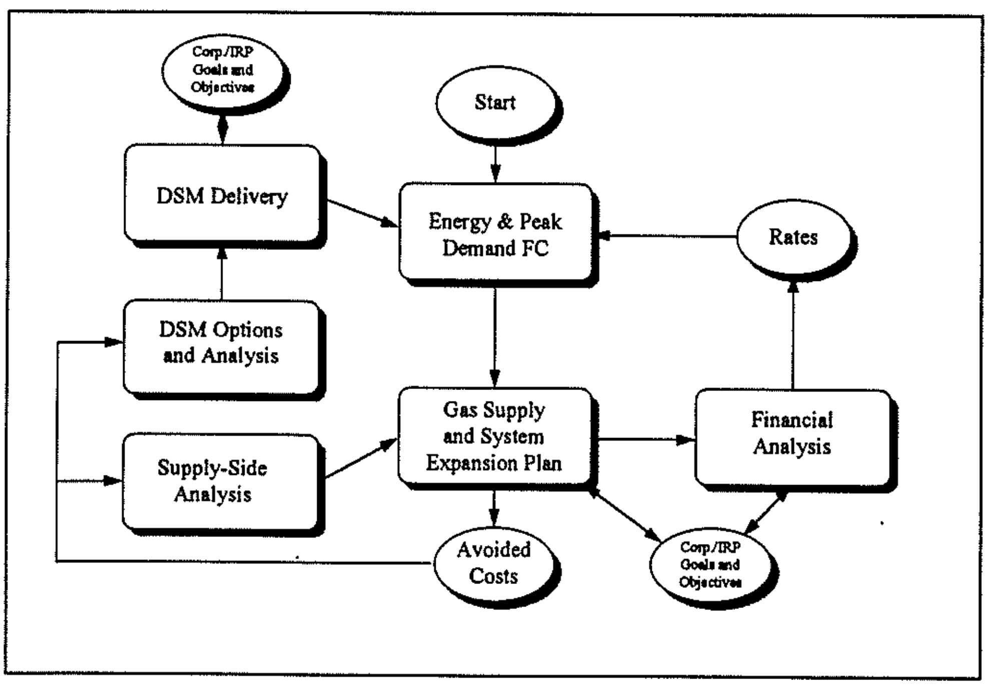
The purpose of this report is to present South Carolina Electric and Gas (SCE&G) Company's Gas Integrated Resource Plan (IRP) for meeting the energy needs of its natural gas customers over the period 1994 – 2008, and to explain the process used to develop it.

SCE&G is a combination electric and natural gas regulated public utility doing business in South Carolina. December, 1993 total number of natural gas customers was 234,588, of which 90% were residential. The service area for natural gas covers more than 19,000 square miles.

IRP Process Overview

Figure ES-1 illustrates the framework for the gas IRP analysis at SCE&G.

Figure ES-1: SCE&G's IRP Process

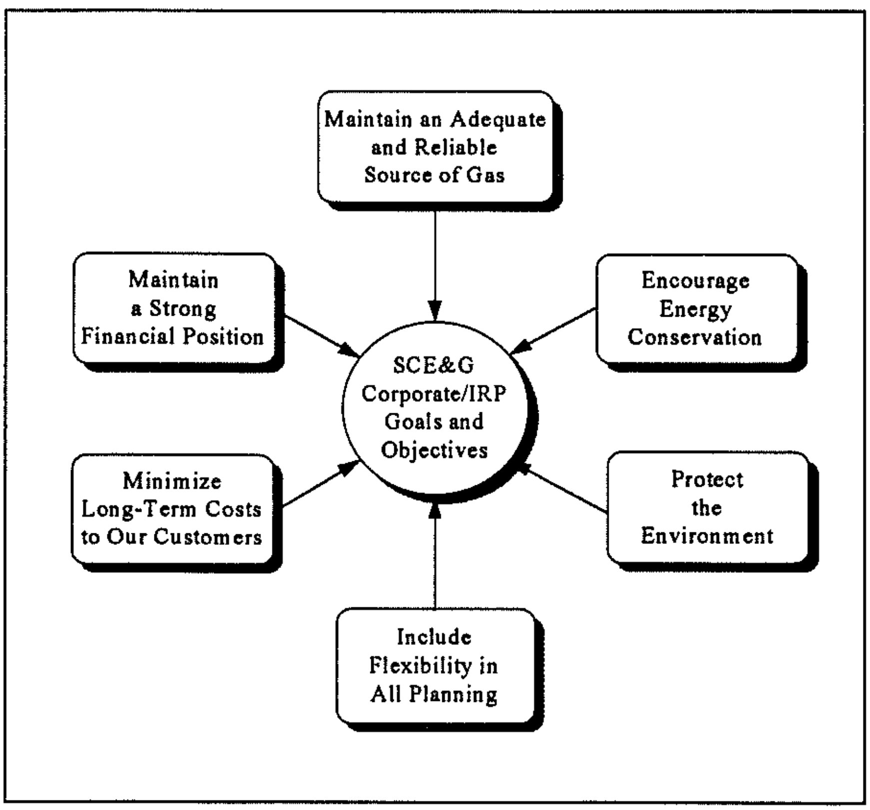


The IRP analysis begins by developing a base case energy sales and peak-day demand forecast using econometrics as the principal methodology. This forecast then becomes the basis for a base case gas supply plan which, together with distribution system expansion/improvement considerations, produces estimates of system avoided costs. The avoided costs estimates, together with other factors as reflected in the Corporate/IRP Goals and Objectives, are used to screen alternative supply-side and demand-side opportunities. Demand-side management (DSM) options are combined as reflected in existing or proposed programs.

Corporate/IRP Goals and Objectives

Simply stated, SCE&G's overall Corporate/IRP goal is to maximize the customer value of its product. The IRP reflects this commitment. There are several components to this overall objective which guide the Company's course of action. These components are illustrated in Figure ES-2 and discussed in Section 1 of this report.

Figure ES-2: SCE&G Corporate/IRP Goals and Objectives



Energy and Peak Demand Forecast

The energy and peak demand forecasts were developed using econometric models. Tables ES-1 and ES-2 summarize projected total annual system therm sales and firm peak-day delivery for the forecast period 1994 – 2008. Figures ES-3 and ES-4 display these same results graphically. Section 2 of the report discusses in detail the SCE&G gas forecast process.

Table ES-1: Annual Therm Sales Forecast (000)

Year	Firm	Interruptible	Transport	Total
1994	206,182	94,743	80,184	381,109
1998	223,590	102,694	80,677	406,961
2003	232,314	105,431	79,761	417,506
2008	240,293	106,477	79,360	426,130

Figure ES-3: Annual Therm Sales Forecast 1994 - 2008

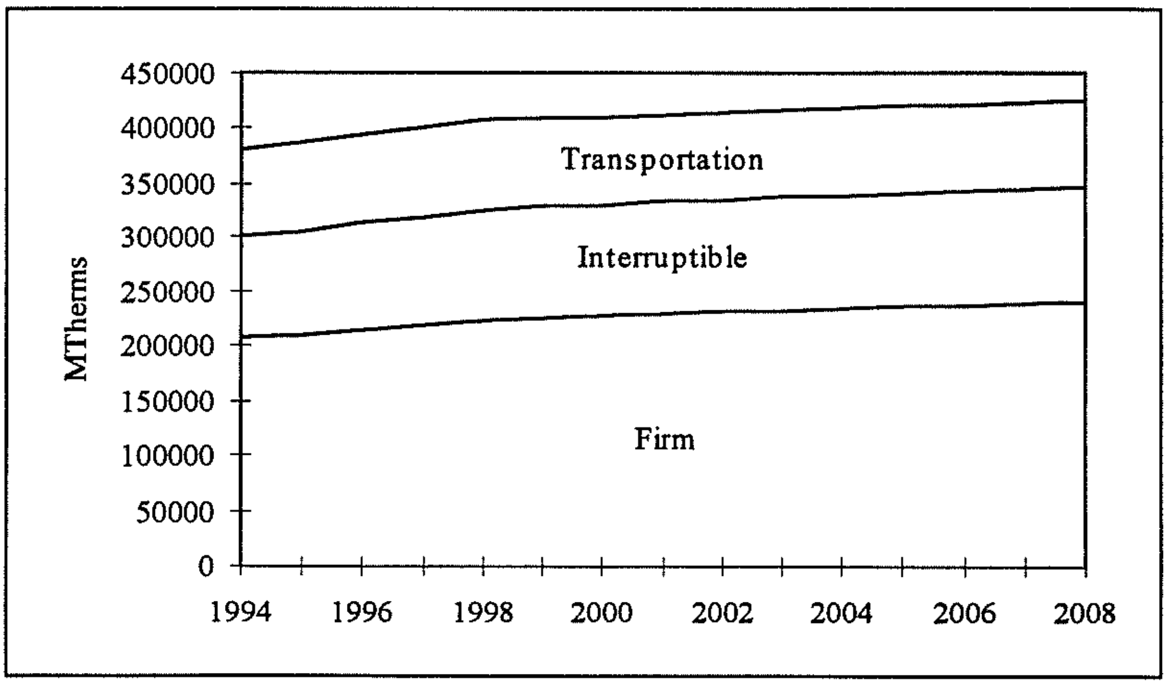
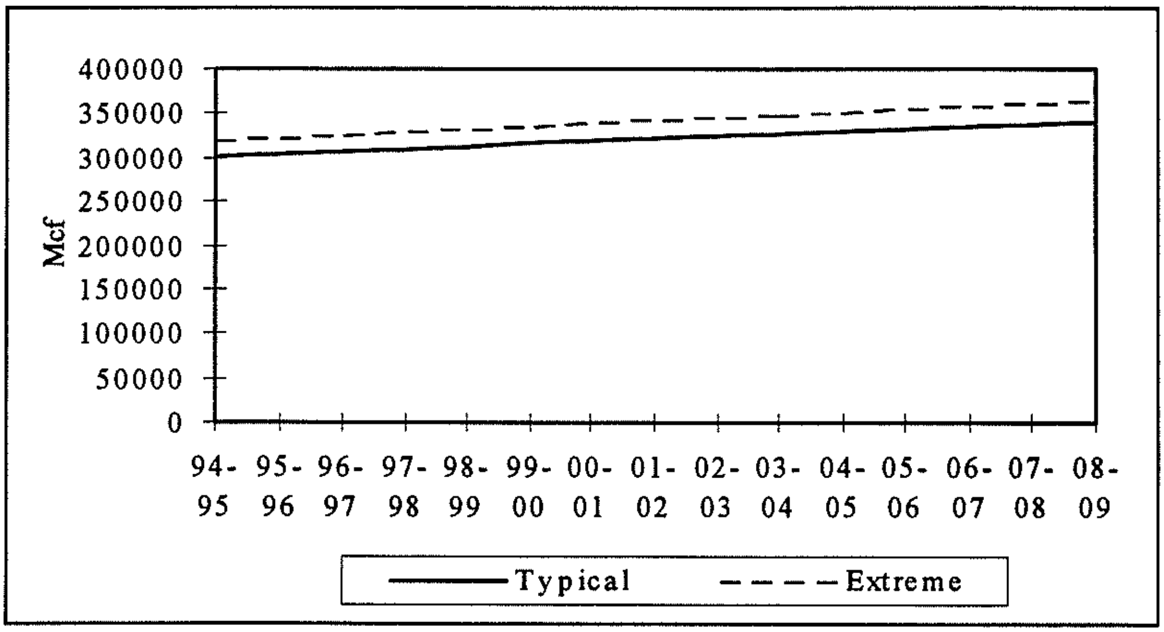


Table ES-2: Firm Peak-Day Forecast

Year	Typical Weather DTS	Extreme Weather DTS	Typical Weather Mcf	Extreme Weather Mcf
1994/95	309,845	328,896	302,288	320,874
1998/99	321,320	341,644	313,483	333,311
2003/04	335,948	357,807	327,754	349,080
2008/09	349,963	373,244	341,427	364,140

Figure ES-4: Firm Peak-Day Forecast (Mcf)
Typical and Extreme Weather
1994/95 – 2008/09

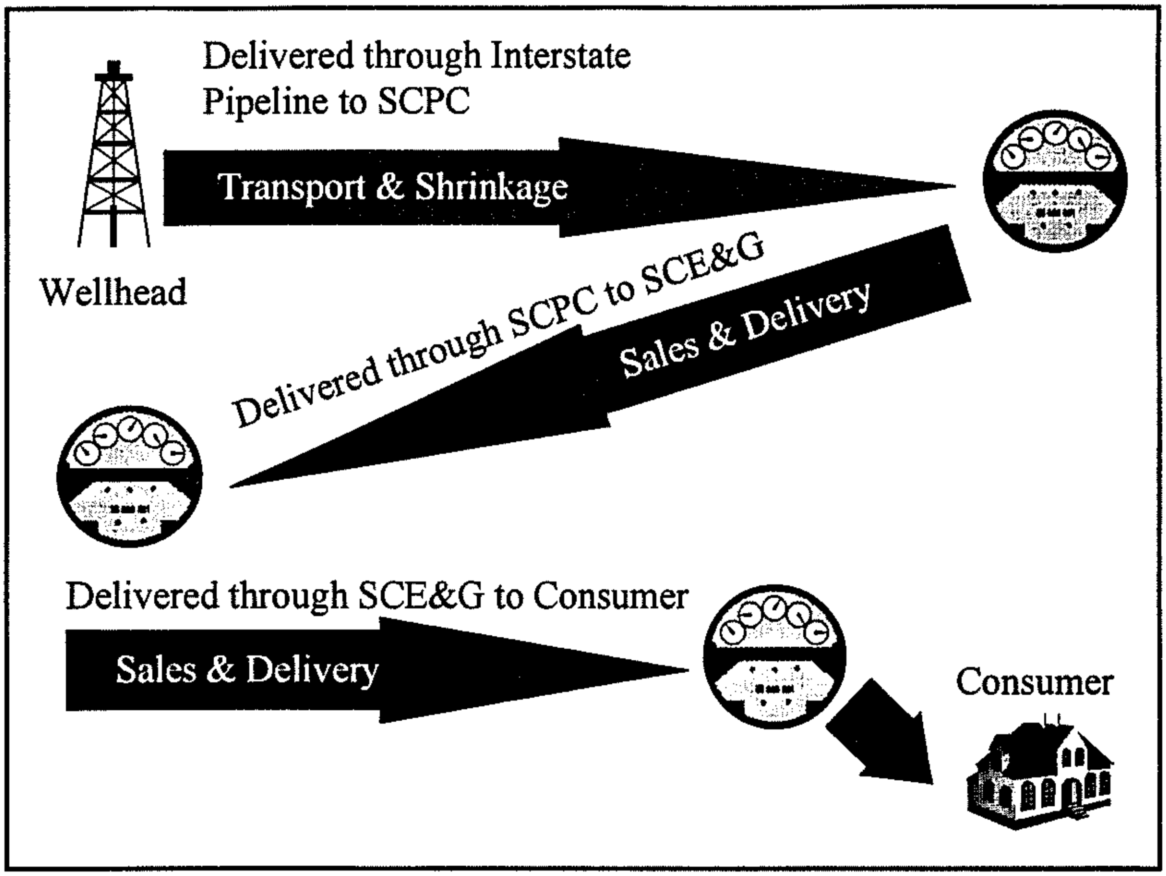


Gas Supply Plan

SCE&G has a contract with South Carolina Pipeline Corporation (SCPC) to provide all of SCE&G's natural gas requirements with a current maximum contract demand of 196,595 DTS (191,800 Mcf) per day. In addition, SCE&G operates four propane air plants (PAP) which have a total capacity of 104,550 DTS (102,000 Mcf) per day. Effective November 1, 1994, SCE&G will increase its contract demand from SCPC by 27,675 DTS to 224,270 DTS per day,. This level of supply from SCPC, together with an output of

92,250 DTS from the PAP facilities, would effectively meet the typical peak design day requirement. This is a situation that bears careful monitoring. In the future, as load grows, SCE&G will need to make new provisions to meet system load requirements. Figure ES-5 illustrates SCE&G's main source of natural gas supply.

Figure ES-5: SCE&G's Gas Supply



Avoided Costs

Avoided costs for SCE&G can be broken down into two major components: *gas supply avoided cost,* which includes commodity and deliverability, as well as the charges from the intrastate transmission pipeline; and the *distribution system avoided cost,* which can include the cost of the mains, services, and meters.

Gas Supply Avoided Cost

Currently for SCE&G there are two supply options: contract demand service including sales and delivery service from SCPC, and four propane air plants.

The avoided demand supply costs for SCE&G was determined by developing a 12-month gas supply forecast incorporating the latest known and measurable cost changes along with other potential changes. The average cost for each dekatherm per year of additional capacity was calculated to be $181.20, or $18.12 per therm per year.

SCE&G's avoided commodity supply cost was based on SCPC's commodity costs for all supply transported through Southern Natural Gas (SNG) and Transcontinental Gas Pipeline (Transco) were developed using New York Mercantile Exchange Futures (NYMEX) prices plus shrinkage, non-gas surcharges, and commodity mark-ups. The annual average avoided commodity cost of gas determined by this forecast was calculated to be $2.44/dt. This price was based on SCE&G's current sales load profile, which produces approximately 80% of sales in the winter months and 20% of sales in the summer months. Different usage patterns for different end-use applications produce different annual average prices with each DSM program tested.

Distribution System Avoided Costs

Distribution system avoided costs are estimates of the change in distribution system costs that result from the change in demand. System improvement projects can be used to estimate SCE&G's distribution capacity costs. An engineering analysis was performed to estimate the system avoided distribution capacity cost, using projects capitalized in 1993. The approach used in determining the demand-related distribution system avoided costs was to tabulate the total investment of system improvement projects ($87,900) and divide by the 1994 forecast design peak-day growth (60,050 therms). The 1993 demand-related distribution avoided cost is $1.46 per therm.

The methodology used to determine the unit avoided cost of main investment for new business was to estimate the direct investment cost per customer and then determine the annual carrying cost of the investment. For distribution system customer related facilities, the avoided cost was computed as the annual carrying cost associated with the service and meter. The 1993 cost of adding an average customer (main, service, and meter) was $977.

DSM Options & Analysis

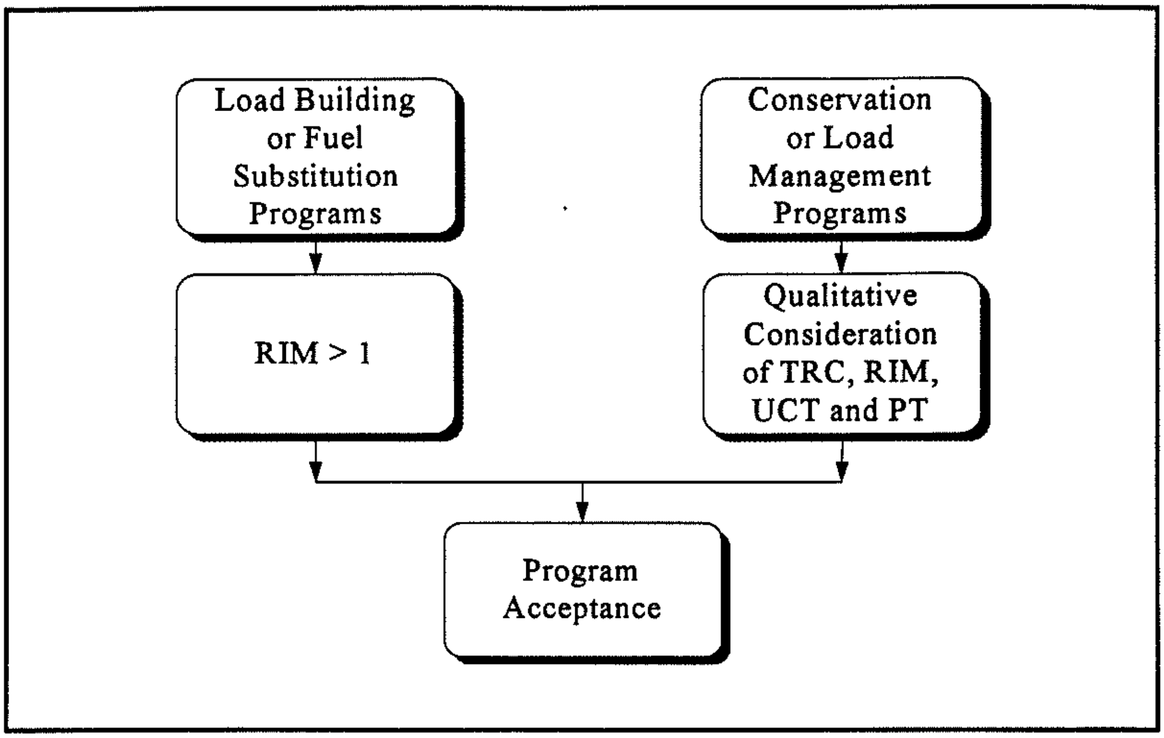
Selection Criteria for DSM Programs

SCE&G's development of DSM screening and selection criteria focused on two major considerations: consistency with the South Carolina Public Service Commission (SCPSC) IRP rules as presented in Order 93-145; and consistency with Company criteria for new investment. The selection criteria guided the evaluation of the DSM strategy and programs.

A uniform standard does not exist for applying the DSM benefit-cost test results in evaluation of DSM programs. However, the SCPSC rules (Order 93-145, Appendix A, dated February 8, 1993) provide guidance regarding the goals of the IRP process and the application of specific tests in specific situations. The IRP Objective Statement included in Order 93-145 gives clear indication that a major goal of the IRP is the minimization of the total costs of the utility's overall system. Section 4 provides additional discussion on this issue.

SCE&G's position is that DSM program evaluation should be based on the impacts to the gas system only. SCE&G believes this to be consistent with the language and the spirit of Commission Order 93-145, as well as comments submitted in Staff's List of Issues dated June 8, 1994 in the proceedings for SC Pipeline Corporation IRP (Docket No. 94-202-G).

Figure ES-6: DSM Evaluation Criteria



SCE&G DSM Evaluation and Program Selection Criteria

In consideration of the above, SCE&G has adopted the following criteria for evaluating potential DSM programs (see Figure ES-6):

- *For load building and fuel substitution programs*, the RIM test results will be used to evaluate the program from a benefit-cost perspective.
- *For conservation and load management program*, the TRC, RIM, Utility, and Participant Test results will be used.

Framework for Analysis

SCE&G's main objective in performing the DSM analysis is to evaluate and enhance DSM programs to better serve our customers. With this in mind, SCE&G utilized an end-use approach in determining the cost-effectiveness of alternative loads and a market segment approach to program implementation. The cost-effectiveness analysis used the standard DSM benefit-cost equations taking into account circumstances specific to SCE&G.

DSM Cost-Effectiveness Tests

The four tests used in these analyses are the Total Resource Cost (TRC) Test, the Ratepayer Impact Measure (RIM) Test, the Utility Cost (UC) Test, and the Participant Test. The RIM Test is also commonly referred to as the Non-Participant Test, and the two terms may be used interchangeably throughout this report.

SCE&G also recognizes the specific circumstances in which the different tests should be used. For load-reducing measures, all four tests were applied. For load-increasing measures, only the RIM test was utilized. This is in keeping with our position to evaluate DSM measures based on their gas system impacts only.

Residential Analysis

The residential analysis focused on the three principal ways in which customers impact SCE&G's system:

1. Existing customers add or conserve load.
2. A home located on an existing main (but previously not a customer) installs a gas appliance and requests new service.
3. The distribution system extends to serve new geographic areas, subdivisions or communities.

One and two above were combined because both represent homes on existing mains (Home-on-Main) and do not require SCE&G to make distribution system main capital investments in order to serve them. Item three represents new business requiring capital investments for main, services, and meters. Therefore, the residential analysis was structured to replicate actual circumstances under which customers request and receive gas service from SCE&G.

Commercial/Industrial Analysis

The primary goal of the commercial/industrial analysis was to determine the cost-effectiveness of typical DSM opportunities. Principal commercial and industrial natural gas end-uses include water heating, food service, cooling, HVAC and industrial processes. The DSM benefit-cost analysis was performed using prototypical commercial and industrial applications as discussed in Section 5.

SCE&G's DSM Benefit-Cost Test Results

The screening of DSM measures was performed using two PC-based spreadsheet models developed at SCE&G for this IRP filing. The first model, the *DSM Screening Model*, performs the DSM cost-effectiveness analysis for each individual DSM measure. The second model, the *DSM Roll-up Model*, aggregates individual DSM measures appropriately to report results at the DSM program level. Table ES-3 displays the results of the cost-effectiveness tests performed.

Table ES-3: RIM Benefit-Cost Test Results

	NPV Per Participant (1993 $)			
	Benefits	Costs	Net Benefit	Benefit-Cost Ratio
Residential Home on Main				
Heating & Cooling	4,838	3,915	923	1.24
Water Heating	1,766	1,215	551	1.45
Total	2,929	2,236	693	1.31
Residential New Business	4,915	4,885	30	1.01
Commercial Water Heating				
Up to 75,000 BTU/hr.	6,813	4,009	2,804	1.70
75,000 - 200,000 BTU/hr.	10,504	5,705	4,798	1.84
200,000 - 350,000 BTU/hr.	26,225	12,414	13,811	2.11
Greater Than 350,000 BTU/hr.	34,623	16,082	19,541	2.15
Commercial Food Service				
Gas Range and Oven	8,733	4,404	4,329	1.98
Deep Fat Fryer	8,644	4,379	4,265	1.97
Convection Oven	3,013	1,956	1,057	1.54
Commercial HVAC				
25 Ton Gas Heat with Electric AC	14,857	14,437	420	1.03
Commercial/Industrial Large-Scale Cooling/Refrigeration				
500 Ton Engine Driven Chiller	315,038	201,111	113,927	1.57
500 Ton Absorption Chiller	471,073	296,268	174,805	1.59

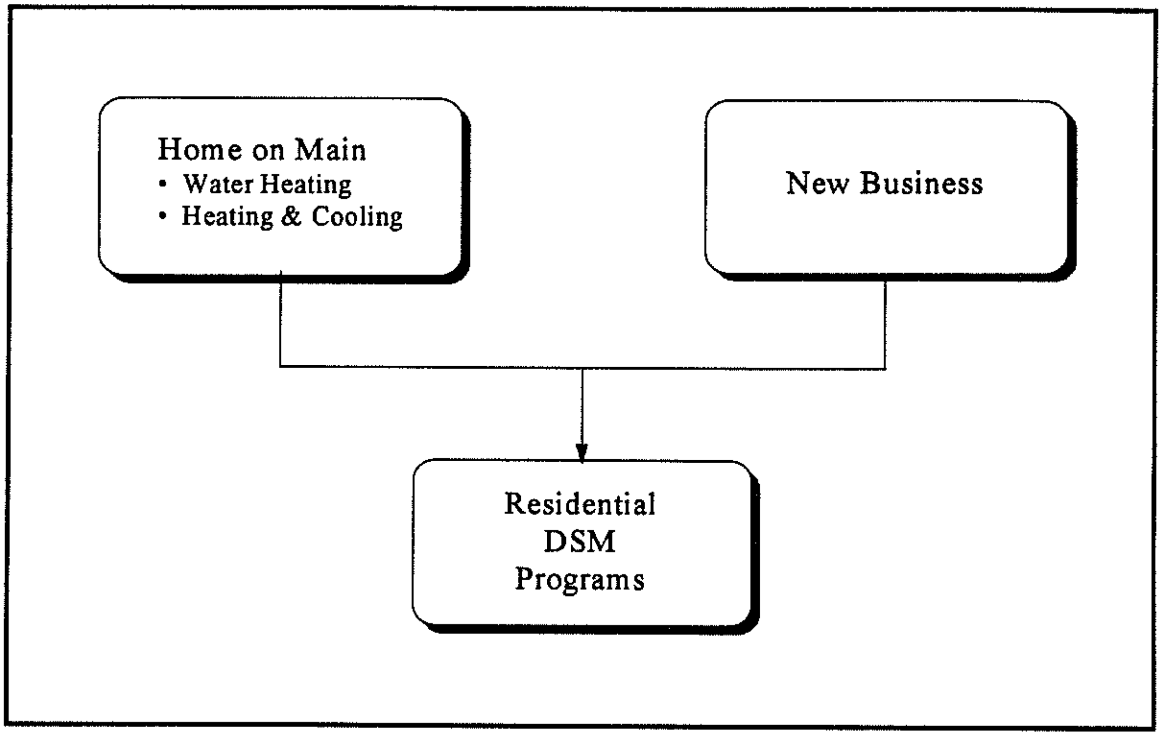
DSM Delivery

As illustrated in Figure ES-9, the delivery of residential sector DSM is accomplished through two components: the *Residential Home-on-Main Program* and the *Residential New Business Program*.

The Residential Home-on-Main Program has two major delivery mechanisms: the *Gas Advantage Water Heater Program*, and the *Gas Advantage Heating & Cooling Program*

(HVAC). The Gas Advantage Water Heater Program was developed to meet customer needs. It is the backbone of SCE&G's residential DSM effort and provides enhanced customer service while building load factor. The success of the program has achieved national recognition.

Figure ES-9: Residential DSM Program Delivery



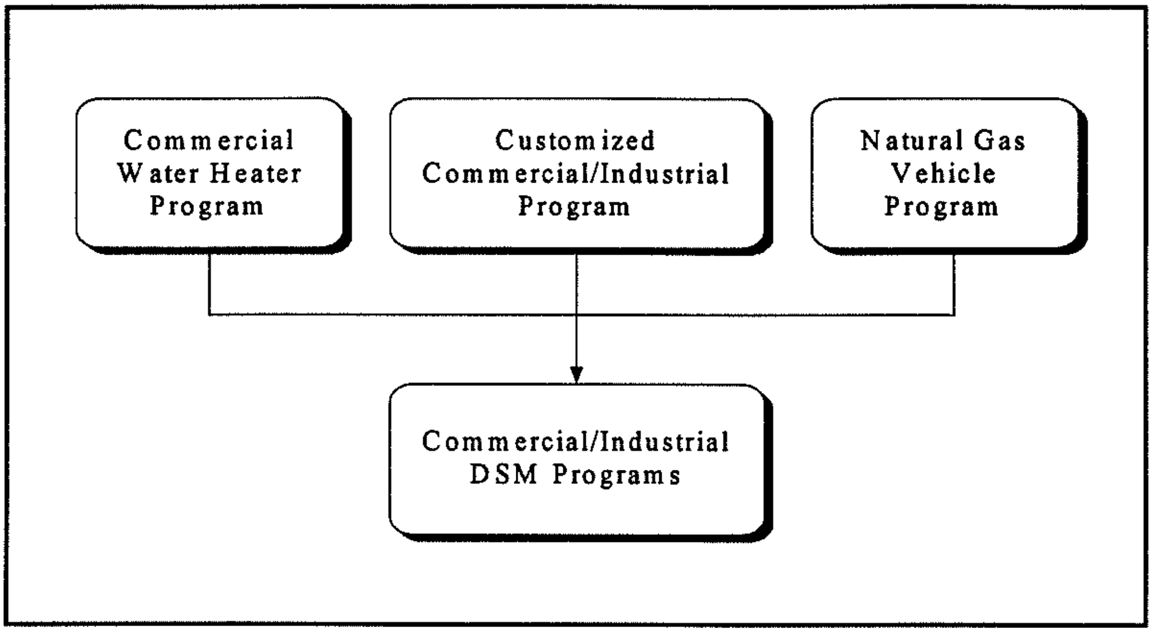
The Gas Advantage Heating & Cooling Program was designed to respond to customer needs, to encourage the use of higher efficiency gas equipment, and to foster better trade ally relations.

The Residential New Business Program was developed to provide customers the option of gas service in new growth areas. The Residential New Business Program focuses on the installation of gas water heating, coupled with one other major gas appliance.

The Commercial/Industrial DSM Programs target both existing and new customers. As illustrated in Figure ES-10, the three commercial/industrial programs are: the *Commercial*

Water Heater Program, the *Customized Commercial/Industrial Program*, and the *Natural Gas Vehicle (NGV) Program*. The NGV program is under development and SCE&G intends to file it with the SCPSC at a later date.

Figure ES-10: Commercial/Industrial DSM Programs



With the exception of the NGV Program, each of the above programs represent existing, ongoing DSM activities at SCE&G. Table ES-4 displays projected program participation, total load impact, and program budgets for years 1994 through 1998.

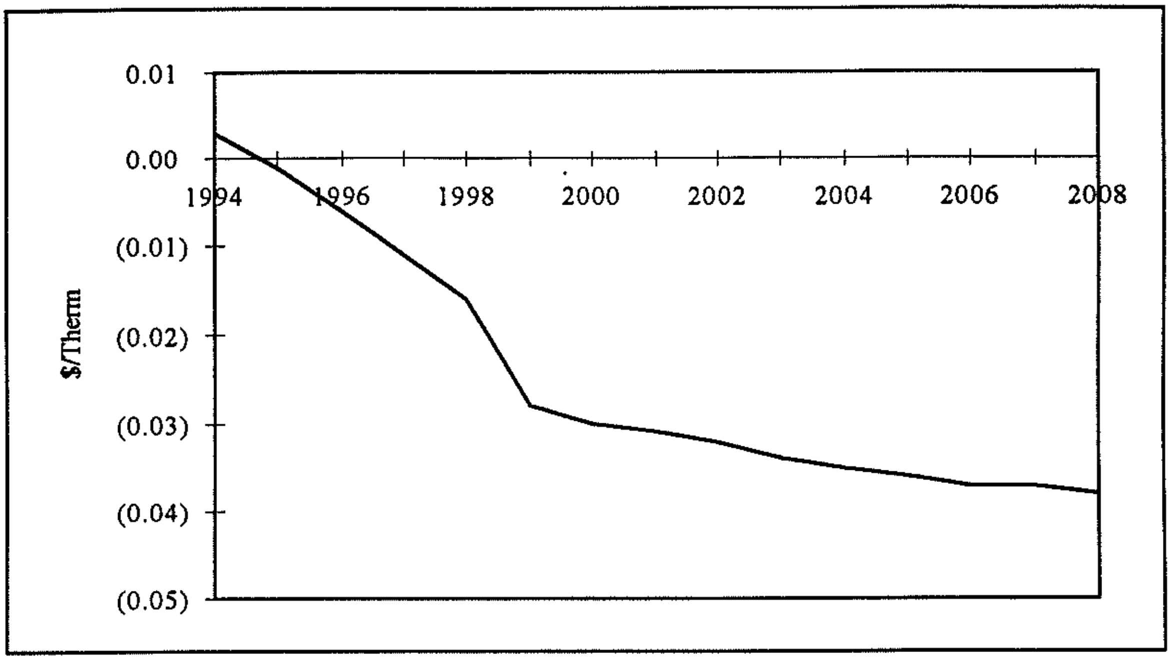
Financial/Rate Impact Analysis

For the financial/rate impact analysis, SCE&G staff adjusted the 15 year forecast of revenue requirements and firm sales to reflect the estimated impact from a five year operation of the DSM programs. Figure ES-11 shows the impact SCE&G's DSM programs are projected to have on average revenue requirements. The projected reduction in average revenue requirements will result in benefits to both program participants and non-participants.

Table ES-4: Five-Year DSM Program Summary

	1994	1995	1996	1997	1998
Gas Advantage Water Heater					
Number of Participants	4,833	4,236	3,716	3,175	2,508
Total Impact (MThs)	1242.1	1088.7	955.0	816.0	644.6
Program Budget (1993 M$)	952.1	874.5	772.1	665.5	534.1
Gas Advantage Heating & Cooling					
Number of Participants	2,475	2,625	2,850	2,975	3,200
Total Impact (MThs)	1616.2	1714.1	1861.1	1942.7	2089.6
Program Budget (1993 M$)	311.9	360.8	389.1	404.9	433.2
Residential New Business					
Number of Participants	1,895	1,975	2,250	2,300	2,500
Total Impact (MThs)	1252.6	2262.2	1487.3	1520.3	1652.5
Program Budget (1993 M$)	524.9	577.1	653.3	667.1	722.5
Residential Total					
Number of Participants	9,203	8,836	8,816	8,450	8,208
Total Impact (MThs)	4110.9	5065.0	4303.3	4279.0	4386.7
Program Budget (1993 M$)	1788.9	1812.3	1814.4	1737.4	1689.8
Commercial Water Heating					
Number of Participants	575	595	625	630	640
Total Impact (MThs)	678.5	702.1	737.5	743.4	755.2
Program Budget (1993 M$)	278.3	317.9	332.5	334.9	339.7
Customized Commercial/Industrial					
Program Budget (1993 M$)	208.0	243.0	243.0	268.0	268.0
Industrial Process					
Program Budget (1993 M$)	50.0	110.0	110.0	110.0	110.0
Total DSM Program Budget (1993 M$)	2,325.2	2,483.2	2,499.9	2,450.3	2,407.5

Figure ES-11: Incremental Revenue Requirement Impact From DSM Programs



Report Organization

In addition to this executive summary, there are ten sections to the report. Section 1 is an introduction which presents pertinent background information about SCE&G, an overview of the integrated resource planning process, and a discussion of the Corporate/IRP goals and objectives which guide the IRP process. The energy sales and peak-day demand forecast is presented in Section 2. The gas supply plan and the methodology for calculating system avoided cost is discussed in Section 3. The demand-side planning component of the IRP is discussed in Section 4. The DSM implementation strategy and programs are discussed in Section 5. Section 6 discusses the financial and rate impact analysis performed together with results. Section 7 presents a sensitivity analysis of key assumptions/variables. Section 8 presents SCE&G's near-term action plan. Section 9 discusses important regulatory issues which need consideration to ensure success of this plan, as well as the entire IRP process, in South Carolina. The final section is a set of appendices containing supporting material.

Section 1: Introduction

The purpose of this report is to present South Carolina Electric and Gas (SCE&G) Company's Gas Integrated Resource Plan (IRP) for meeting the energy needs of its natural gas customers over the period 1994 – 2008, and to explain the process used to develop it. This section presents some general information about SCE&G, an overview of the integrated resource planning process and the Corporate/IRP goals and objectives that the process supports.

About the Company

SCE&G, a subsidiary of SCANA, is a combination electric and natural gas regulated public utility doing business South Carolina. The Company also renders urban bus service in the metropolitan areas of Columbia and Charleston, South Carolina. SCE&G's business is seasonal; sales of natural gas are higher during the winter months and sales of electricity are higher during the summer and winter months because of space conditioning requirements.

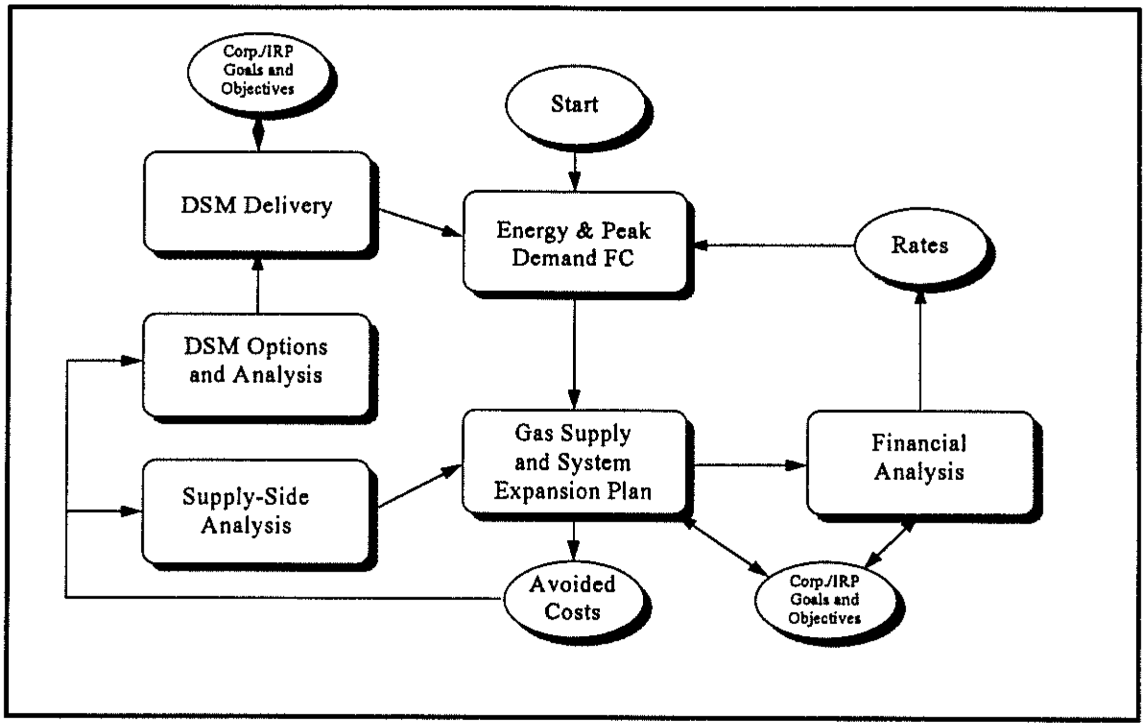
The Company's gas distribution system consists of 5,506 miles of main located throughout 32 counties in South Carolina. December, 1993 total number of natural gas customers was 234,588, of which 90% were residential. The service area for natural gas covers more than 19,000 square miles. SCE&G receives its gas from South Carolina Pipeline Corporation (SCPC) through 119 delivery points where gas is metered and billed on a monthly basis. SCPC is also a subsidiary of SCANA. SCE&G neither owns nor operates a pipeline system connecting these various delivery points. On the other hand, SCPC has operated intrastate natural gas pipelines in South Carolina since 1957. It has over 36 years of experience in pipeline operations and system supply. Accordingly, SCE&G has great confidence in relying on SCPC for these functions.

The Company's electric service area extends into 24 South Carolina counties covering more than 15,000 square miles in the central, southern, and southwestern portions of South Carolina. Total estimated population of the counties representing SCE&G's combined electric and natural gas service area is approximately 2.2 million.

IRP Process Overview

Figure 1 illustrates the framework for the gas IRP analysis at SCE&G.

Figure 1: SCE&G's IRP Process



The IRP analysis begins by developing a base case energy sales and peak-day demand forecast, using econometrics as the principal methodology. The forecast then becomes the basis for a base case gas supply plan which, together with distribution system expansion/improvement considerations, produces estimates of system avoided costs. The avoided costs estimates, together with other factors reflected in the Corporate/IRP Goals and Objectives, are used to screen alternative supply-side and demand-side opportunities.

Demand-side Management (DSM) options are combined as reflected in existing or proposed programs.

Corporate/IRP Goals and Objectives

The overall objective of SCE&G is to maximize the customer value of its product. The IRP reflects this commitment. As discussed below and illustrated in Figure 2, there are several components to this overall objective which guide the Company's course of action:

- **Maintain an Adequate and Reliable Source of Energy**: It is SCE&G's goal to have sufficient supplies of electricity and natural gas to satisfy the energy needs of our customers at all times. When a firm supply customer demands gas, SCE&G intends to deliver the gas.

- **Encourage Energy Conservation**: SCE&G believes in the efficient use of energy and will provide programs to help customers use energy wisely.

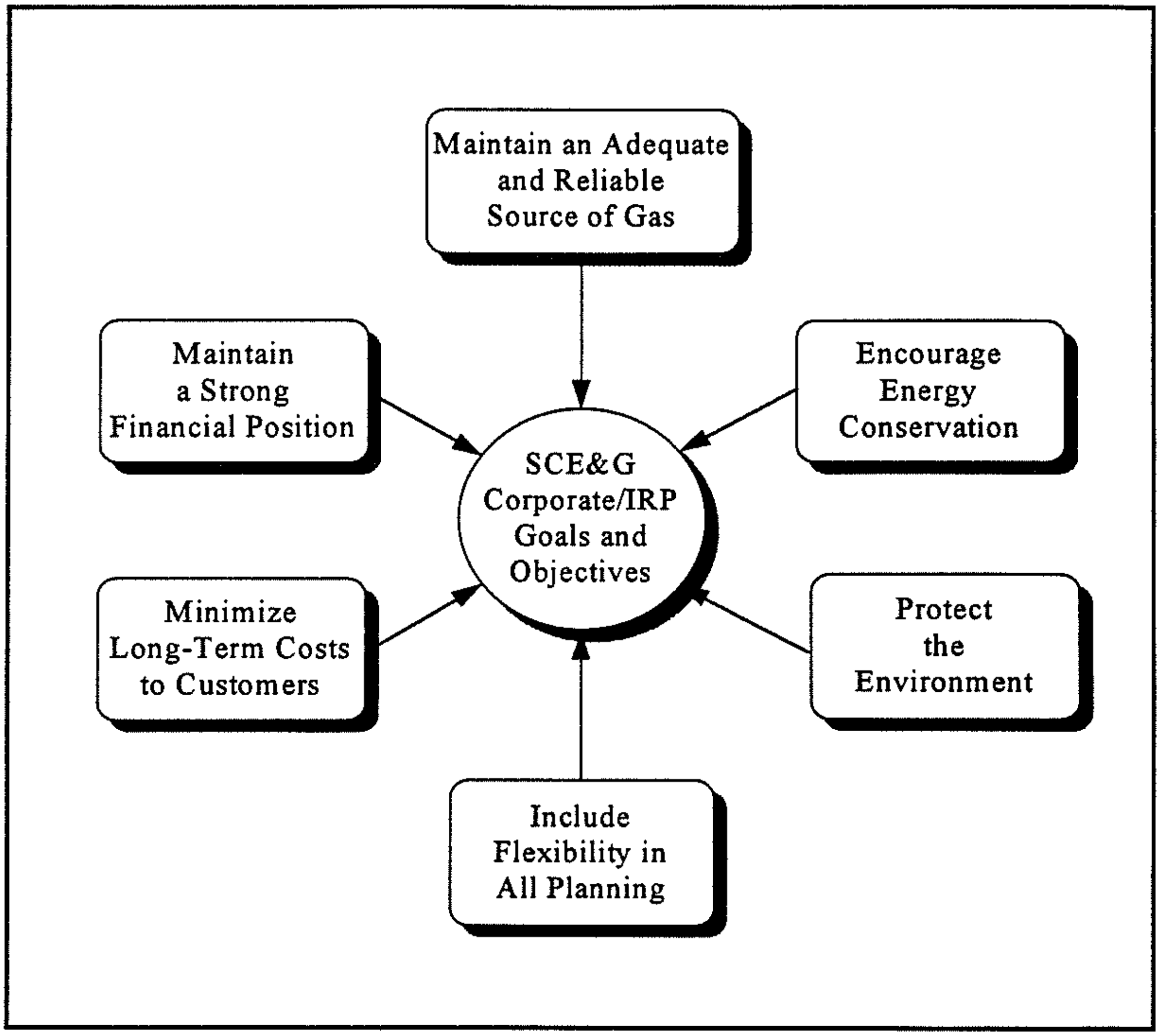
- **Protect the Environment**: SCE&G will meet and, if possible, exceed the requirements of all local, state, and federal environmental laws and regulations and will work with government representatives at all levels to isolate, analyze, and solve problems related to the environment.

- **Include Flexibility in All Planning**: Because the future is uncertain, SCE&G will seek to develop plans that are flexible enough to respond to changes in operating conditions.

- **Minimize Long-term Costs to Customers**: One of the primary objectives of SCE&G is to provide an adequate and reliable source of energy at the least possible cost to customers. Our actions in the short term and our plans for the longer term are guided by this fundamental objective.

- **Maintain a Strong Financial Position and Provide a Fair and Secure Return to Investors**: In order to provide reliable and quality service to customers, it is necessary to maintain the financial health of the organization and to provide a fair return to shareholders.

Figure 2: SCE&G Corporate/IRP Goals and Objectives



Environmental Considerations

SCPSC Order 93-145 addresses environmental considerations in a variety of ways. The initial paragraph of the Order states:

> *The objective of the IRP Docket was to develop a plan that results in the minimization of long run total costs of the utility's overall system and produces the least cost to the customer consistent with the availability of an adequate and reliable supply of natural gas while maintaining system flexibility and considering environmental impacts.*

Paragraph B.8. expands the above guidelines to give specific direction regarding the incorporation of relevant environmental costs and benefits into the IRP:

> *Environmental costs are to be considered on a monetized basis where sufficient data is available. Those environmental costs that cannot be monetized must be addressed on a qualitative basis within the planning process. Environmental costs are to be considered within the IRP to the extent that they impact the utility's specific system costs such as meeting existing regulatory standards and such standards as can be reasonably anticipated to occur. The term "reasonably anticipated to occur" refers to standards that are in the process of being developed and are known to be forthcoming but are not finalized at the time of analysis. This does not mean that the utility is prohibited from incorporating factors which go beyond the above definition. Should the utility feel that other factors (environmental or other) are important and need to be incorporated within the planning process, it needs to justify within the IRP the basis for inclusion.*
>
> *a. Environmental costs should be monetized and included within the planning process whenever possible. To the extent that*

environmental costs cannot be monetized, the utility must consider them on a qualitative basis in developing the plan. The same guideline applies to relevant utility and customer costs.

b. *Each utility must provide the general environmental standards applicable to each supply-side option and explain the impact of each supply-side option on compliance with the standards. To the extent feasible each utility should seek to identify on a quantitative basis the impact of demand-side options on the environment (i.e. reduced pollutant emissions, reduced waste disposal, increased noise pollution, etc.). Such impacts can be reflected on a qualitative basis when quantitative information is not available.*

c. *Each utility should identify and monetize, to the extent possible, the cost of compliance for existing and projected supply-side options.*

SCE&G believes that at the present time the quantification of environmental costs and benefits, as related to potential supply or demand-side opportunities, is subject to significant judgment and uncertainty. Furthermore, until a consensus can be reached within South Carolina regarding the weighting of environmental impacts, such activities would only add further uncertainty to the IRP process. SCE&G further understands that responsible institutions have a duty to the people and places they serve to conduct business in a way that exhibits ecological concern. While SCE&G is committed to providing dependable, affordable energy, it is our stated goal to do so in an environmentally sensitive manner. In keeping with those principles, SCE&G incorporates the following Corporate Environmental Policy, on a qualitative basis, in the IRP process:

- To respect the environment in all phases of our operations;
- To meet the requirements of all local, state, and federal environmental laws and regulations;
- To work with government at all levels to isolate, analyze, and solve problems related to the environment;
- To address environmental policy issues with positive strategies that reflect the interests and concerns of our customers;
- To utilize sophisticated, cost-effective environmental technologies/procedures, and to encourage and investigate new technologies which help maintain a better environment;
- To employ prospective planning that enables us to respond quickly and effectively to any environmental incident involving SCE&G, and to be guided in our response by our concern for the community health and well being;
- To ensure that all SCE&G employees are aware of the company's commitment to environmental protection;
- To provide employee training programs that demonstrate SCE&G's concern for the environment, and that encourage employee involvement in environmental protection efforts;
- To aggressively oversee all company activities to ensure compliance with these tenets and with all legal and regulatory requirements, and
- To provide our customers environmentally compatible sources of energy and to encourage the use of efficient, state-of-the-art, electric and gas technologies.

Section 2: Energy and Peak Demand Forecast

Overview

This section of the IRP describes SCE&G's methodology for forecasting annual energy sales, firm peak-day demand, and the impact of the DSM programs on system requirements. Table 1 and Figure 3 display the annual therm sales forecast.

Table 1: Annual Therm Sales Forecast (000)

Year	Firm	Interruptible	Transport	Total
1994	206,182	94,743	80,184	381,109
1998	223,590	102,694	80,677	406,961
2003	232,314	105,431	79,761	417,506
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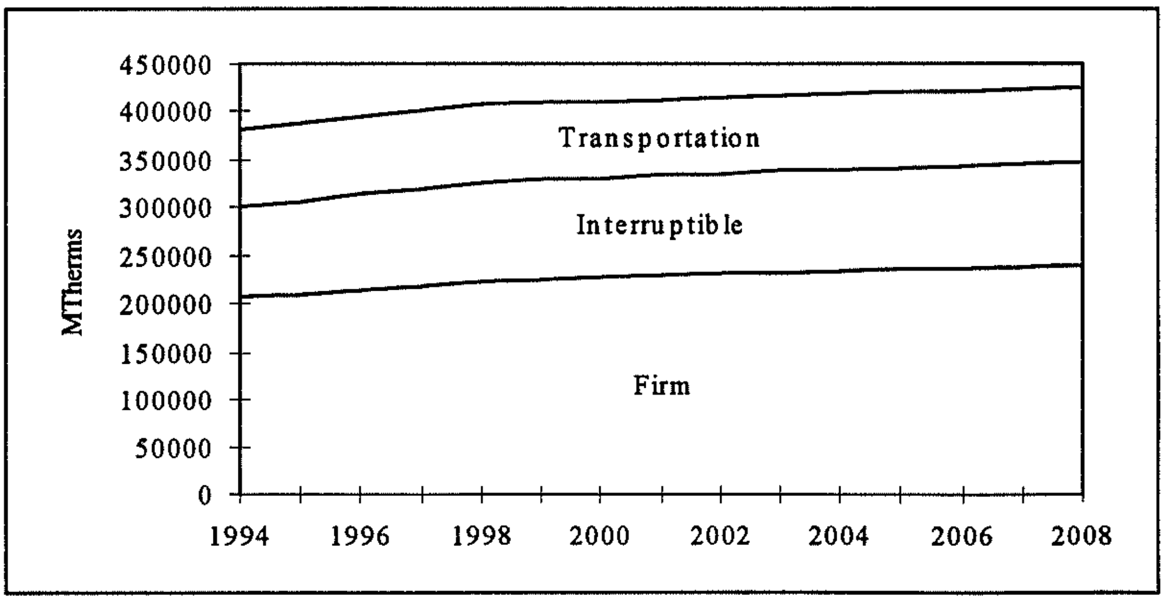
Figure 3: Annual Therm Sales Forecast 1994 – 2008



The day with maximum natural gas sales usually occurs on the coldest day of the winter season. It is typically the day when interruptible customers have been interrupted and when virtually no gas is being delivered to the interruptible transportation customers. The forecast of peak-day sales to firm customers is summarized in Table 2 and displayed in Figure 4.

Table 2: Firm Peak-Day Forecast

Year	Typical Weather DTS	Extreme Weather DTS	Typical Weather Mcf	Extreme Weather Mcf
1994/95	309,845	328,896	302,288	320,874
1998/99	321,320	341,644	313,483	333,311
2003/04	335,948	357,807	327,754	349,080
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Figure 4: Firm Peak-Day Forecast (Mcf)
Typical and Extreme Weather
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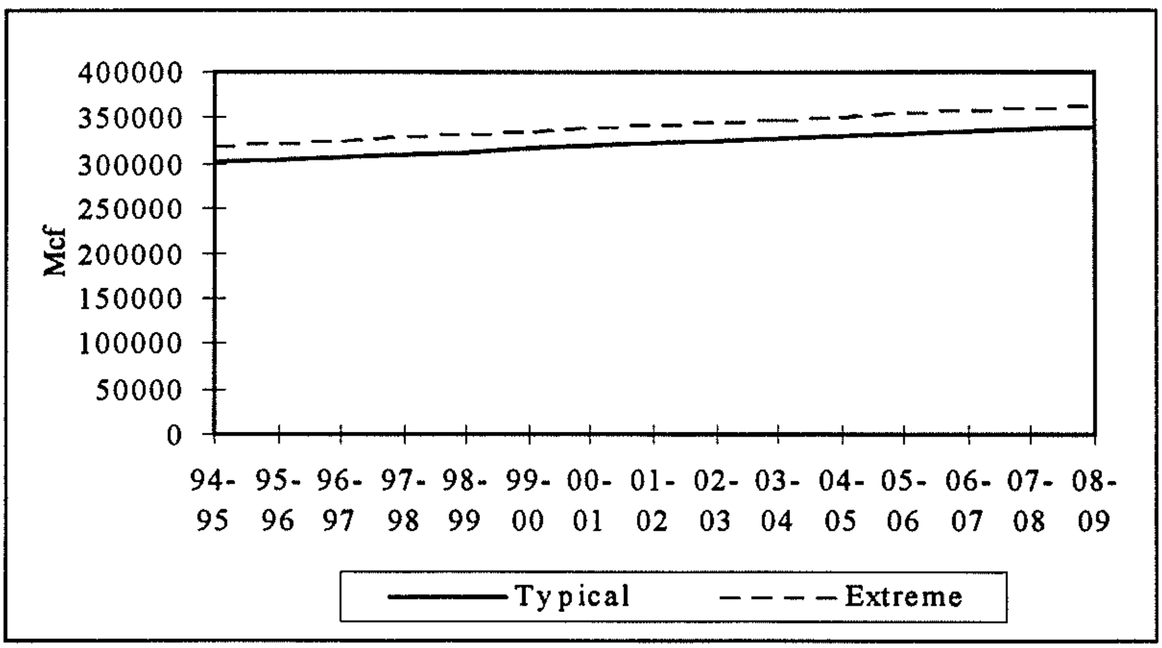


The methodology for projecting these sales is described on the following pages with many of the detailed results presented in the Appendices A – G.

Energy Sales Forecast

This section discusses the development of the long-range energy sales forecast which was developed in two stages. The first stage incorporated economic analysis, econometric techniques, an evaluation of statistical measures, and an analysis of historic gas sales trends. This produced a preliminary or base case forecast. In the second stage, the base case forecast was adjusted to incorporate more recent trends and changes in gas sales, such as DSM programs. Finally, the long-range forecast was combined with the short-range forecast for 1994/95 to produce the final forecast.

The long range gas sales forecast was developed for each class of service: residential, commercial firm and interruptible, industrial firm and interruptible, interdepartmental, and transport. These classes were disaggregated into appropriate subgroups where data was available and where differences were notable in the data patterns. A customer forecast was also developed for each major class of service. For the residential class, forecasts were also disaggregated into housing type (single family, multi-family, and mobile homes). These subgroups were chosen based on available data and differences in the average usage levels and/or data patterns. With the exception of the residential class, the forecast for sales was estimated based on total usage in that class of service. For the residential category, customers and average usage per customer were estimated, and total sales were then calculated as a product of the two.

Residential customers were projected on the basis of growth in non-spaceheating electric customers for SCE&G, plus the change in gas-only customers. The forecast for electric non-spaceheating customers is based on population and real personal income growth within the SCE&G service area. Utilizing this projection provides a reliable foundation for the gas customer forecast. However, the success of the gas water heating program over the past 5 years has caused the proportion of combination gas and electric customers within the non-spaceheating population to increase. To capture this effect, a Gompertz curve was used to model the saturation of combination customers. The Gompertz curve is generally shown as:

$$y = ab^{c^{**}t}$$

where 'a' is the maximum value the curve approaches and '$b^{c^{**}t}$' measures the proportion by which 'y' falls short of 'a' for any point in time, 't'. For the forecast, 'a' was assumed to be .85, i.e., ultimately 85% of the non-spaceheating customers are also gas customers. Values for 'b' and 'c' were determined analytically to be .75 and .91, respectively. Consequently, the saturation rate increases but at a decreasing rate throughout the forecast.

As mentioned earlier, sales projections were ultimately developed by class for the final forecast. For industrial sales, however, class switching among firm, interruptible, and transport customers caused extensive variation in class sales over the past 3 years. Such fluctuations affect the accuracy of the forecast, so an alternative technique was derived which projected total industrial load. This seems appropriate because total industrial load has varied relatively little in comparison to class changes. Allocation of projected total industrial sales back to individual classes was done on the expected composition of sales from the 1995 short-run forecast. These were 6% for firm, 47% for interruptible, and 47% for transport.

Finally, interdepartmental sales were included for the years 1995 – 2003. Values for the remainder of the forecast period were interpolated from interdepartmental sales for the final year, 2003.

Econometric Methodology

Development of all models, except for residential customers, was econometric in approach, using 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 which should explain the first, such as weather, personal income, or population growth. This method is mathematically constructed so that the resulting combination of explanatory variables produces 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 multiplied by an estimated coefficient.

Several statistics which indicate the success of the regression analysis fit are shown in Appendix C for each model. The indicators are R^2, Root Mean Squared Error of the Regression, Durbin-Watson Statistic, and the T-Statistics of the Coefficient. The T-Statistics are shown in parenthesis under each variable in the equation. Computer programs *PROC REG* and *PROC AUTOREG* of SAS were used to estimate all regression models. 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 and multicollinearity. *PROC AUTOREG* was used if autocorrelation was present as indicated by the Durbin-Watson statistic.

Prior to developing the long-range models, several design decisions were made:

1. 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 sales. These forecasted growth rates are then applied to the most recent historical period to obtain the forecast level for customers or sales. This is a constant elasticity model. Therefore, it is very important to evaluate the reasonableness of the model coefficients.

2. One way to incorporate the effects of conservation was to incorporate the real price of gas. Models selected for the major classes would include this variable, if significant.

3. The remaining variables to be included in the models for the major classes would come from four categories:
   A. Demographic variables: Population.
   B. Measures of economic well being or activity: Real personal income, real per capita income, employment variables, and industrial production indices.
   C. Weather variables: Heating Degree Days (HDD).
   D. Variables identified through residual analysis or knowledge of political changes, major economic events, etc., such as the foreign oil price increases in 1979 and recession versus non- recession years, etc.

Standard statistical procedures were used to obtain preliminary specifications for the models. Model parameters were then estimated using historical data through 1992, and competitive models were evaluated on the basis of:

1. 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.

2. An analysis of the reasonableness of the long-term trend generated by the models. The evaluative criterion was whether there were any obvious problems, such as the forecasts exceeding all rational expectations based on historical trends and current industry expectations.

3. An analysis of the reasonableness of the elasticity coefficient for each explanatory variable.

As a result of the above procedure, final models were obtained for each class or, in the case of industrial use, combined classes. The equations and selected statistical measures for each class of service in the gas sector are provided in Appendix C.

The drivers for the long-range gas forecast included the following variables:

1. Service Area Real Per Capita Income
2. Service Area Industrial Production
3. Service Area Commercial Employment
4. Real Price of Firm Gas
5. Real Price of Interruptible Gas
6. Real Price of Alternate Fuels
7. Annual Heating Degree Days

Service area data was used for all classes with the exception of prices, which were based on national averages.

Economic Assumptions

In order to generate an econometric forecast, projections must be available for the exogenous variables. The service area forecasts for the economic and demographic variables were obtained from DRI/McGraw-Hill (DRI). The US trend projection used by DRI to develop the service forecast is characterized by slow, steady growth, representing the mean of all possible paths that the economy could follow. Increases in real GNP average 2.2% between 1993 and 2013, with consumer prices averaging 3.7% annually over the same time frame. For the remainder of the 1990s, growth in real output is constrained by slower population growth, averaging 0.9% from 1993 to 2003 and 0.8% thereafter, a gradual tapering of the 1.0% average growth since 1967. Slower population growth leads to a period of softening in housing and other consumer goods markets. Real interest rates remain high by pre-1979 standards and the average unemployment rate of

5.7% over the projection period is higher than that experienced on average since 1963. This suggests that the "natural" rate of unemployment will increase, maintaining a trend which began in the 1970s. Although energy prices eventually rise faster than overall inflation, crises of the magnitude of OPEC I and OPEC II are unlikely.

Projected gas prices were split into two components, firm and interruptible, with one price used to represent alternate fuels. The source of forecast growth rates for these drivers was DRI's Personal Consumption Natural Gas Deflator, the Producer Price Index for Natural Gas, and the Produce Price Index for Refined Petroleum Products, respectively. The mean growth rate by time interval is shown in Table 3 for these three categories.

Table 3: Mean Gas Price Growth Rate

Time Period	Firm Prices	Interruptible Prices	Residual Fuel Prices
1995 – 2000	1.1	3.0	3.0
2001 – 2005	1.3	2.5	2.5
2006 – 2010	0.8	1.8	1.8

Since the DRI growth rates are based on national expectations, it is not certain that SCE&G's gas costs will track them in lock-step fashion. For example, South Carolina is located closer to the Gulf Coast, which would suggest lower rates of price increase. Estimation of the relationship between SCE&G's firm gas price changes and national firm gas price changes was done by developing a regression model relating these two variables over the period 1975 – 1991. Results indicated that on average SCE&G firm gas prices rose 0.7% for every 1% change in national firm prices. For forecasting purposes, a slightly higher value of 0.8% was used.

The situation was slightly more complicated for interruptible gas prices because in recent years alternate fuel prices have served as a ceiling to interruptible rates in South Carolina. This stems largely from the ability of interruptible customers to burn high-sulfur fuel oil. Therefore, a regression model was constructed which related SCE&G interruptible gas prices to alternate fuel prices from 1975 – 1991. Results indicated that SCE&G's

interruptible prices were indeed significantly related to alternate fuel costs, and essentially moved with them in a 1-to-1 fashion. Therefore, for the forecast horizon, this relationship was assumed to continue.

Annual heating degree days were assumed to be normal throughout the forecast, which means no increases or decreases in gas sales result from abnormal weather. The tables in Appendix A show the historical data used to develop the models and the values for the exogenous variables assumed to occur for the forecast horizon.

Naval Base Closing and Other Impacts

Forecasts developed with regression models and their economic drivers may not adequately capture sales responses from unique future events. These factors were handled by off-line changes to the forecast. Candidates for such treatment were the expansion of gas supply into St. Matthews, Daniel Island in Charleston, and the closing of the Charleston Naval Base. For the first two items, customer additions were available through the year 1998, after which point it was assumed there would be no further incremental gains from these programs. Consequently, after the initial sales projections were made with the regression models, additional customers were added to the appropriate classes.

There was no explicit adjustment for the closing of the Charleston Naval Base. This was due to the modeling process for residential gas customers, where increases were driven by growth in the electric residential non-space heating market. Since this sector had already been adjusted for customer losses due to the shutdown, there was no need to make any further reductions to gas customer growth. Indeed, doing so would have resulted in overstating losses from this event.

While the residential sales impact was implicitly contained in the forecast, the commercial impact of the closing was not treated in the long-run forecast. The customer reductions were anticipated to be quite small, on the order of 0.2% of the total customer population.

Forecast Results

The product of the forecast process and further adjustments for SCE&G gas sales is shown in Appendix E. Using economic and other adjustments discussed earlier, total sales will grow 0.8% annually for the years 1994 – 2013. However, near-term growth is much stronger, with annual increases of 1.3% projected through the year 2000. The remainder of the forecast horizon thus shows much reduced gains of 0.5% per year, the result of lower economic growth and higher real gas prices.

Most classes are projected to increase throughout the forecast horizon. Residential sales are impacted by customer and average use change, with the former growing consistently and the latter declining after several years of growth. This decline in average use stems from price and non-price induced conservation, smaller housing units, and more efficient heating units. The forecast for residential use shows a yearly increase in sales of 0.9%, the result of annual increases in average use of 0.1% through 2000 and -0.5% yearly reductions thereafter. Total residential sales do not match this drop, however, due to a 1.2% annual growth in customers.

Industrial firm sales are projected to increase by 0.2%. This category shows low growth due to conservation impacts and shifts to interruptible use. Industrial interruptible use, on the other hand, is projected to grow at a 0.4% rate, while its non-traditional counterpart, transport, effectively shows no growth.

Both commercial sales groups are anticipated to grow in the future, primarily as a result of continued growth in service-oriented industry. Commercial firm sales are projected to grow 1.4% annually, while commercial interruptible grows somewhat less at 1.0%.

Finally, interdepartmental sales are determined by dispatch of the Hagood turbine, so annual growth rates are not meaningful. Usage fluctuates between 0.4 million and 2.1 million therms.

Firm Peak-Day Demand Forecast

The firm peak-day demand forecast was produced for three weather scenarios and by class of service. The three scenarios – typical peak weather, mild weather and extreme weather – are shown in Table 4.

Table 4: Gas Demand Forecast (Mcf)
Mild Weather, Typical Peak Weather, and Extreme Weather

Year	Mild Weather	Typical Peak Weather	Extreme Weather
	HDD = 32 Prior HDD = 31	HDD = 46.6 Prior HDD = 39.0	HDD = 49 Prior HDD = 41
1994/95	200,743	302,288	320,874
1995/96	201,665	304,829	323,710
1996/97	202,454	307,131	326,289
1997/98	203,657	310,090	329,570
1998/99	205,148	313,483	333,311
1999/00	206,454	316,530	336,676
2000/01	207,584	319,271	339,713
2001/02	208,805	322,130	342,872
2002/03	210,006	324,930	345,964
2003/04	211,236	327,754	349,080
2004/05	212,410	330,457	352,064
2005/06	213,756	333,416	355,317
2006/07	214,939	336,088	358,262
2007/08	216,125	338,750	361,194
2008/09	217,336	341,427	364,140

For the upcoming winter, 1994/95, annual gas peak-day demand is projected to range from 200,743 Mcf to 320,874 Mcf, with the typical peak-day at 302,288 Mcf. The compound annual growth from 1994/95 to 2008/09 is 0.9% for the typical peak scenario, with peak-day volume increases averaging 2,796 Mcf annually.

The peak demand forecast methodology combined data and techniques from various sources in its preparation. Most importantly, firm demand was disaggregated into separate class, rate, and housing type categories. This was accomplished by developing daily average use models based on monthly data, which is available on a detailed basis. In comparison, actual daily firm gas loads may only be obtained in the aggregate. An evaluation of this approach was made using 42 Heating Degree Days (HDD), the same weather which occurred on January 19, 1994, this past winter's peak-day. In this case, the average daily model estimate of peak demand was within 1.1% of the actual peak.

Another advantage of utilizing average daily use information is that it becomes possible to determine each group's contribution to total peak demand. Based on the above methodology, the allocation of peak demands by category is shown in Table 5. These values were then applied to a daily gas sendout model based on winter 1994/95 to derive class/rate estimates of peak demand which incorporate lagged HDD effects and other information.

Table 5: Allocation of Peak Demand by Customer Category

Customer Category	% of Peak
Residential Single Family (SF)	62.9
Residential Multi-Family (MF)	6.7
Residential Mobile Home (MH)	1.9
Small Commercial	21.5
Large Commercial	2.3
Small Industrial	0.9
Large Industrial	2.5
Firm Transport	1.3
Total	100.0

A forecast methodology which combines class/rate data with daily sendout models allows the gas peak demand forecast to be produced by class of service. Since customer projections are available by these groupings, it is possible to forecast class/rate peak demand by combining the customer forecast with daily use per customer model results. The advantage derived from this approach is that proper weights are assigned to the fastest growing classes, namely residential and small commercial. In addition, the class detail can facilitate planning for extreme weather conditions.

One final advantage relates to measuring efficiency improvements and DSM impacts. With implementation of the National Appliance Energy Conservation Act, which mandated shipment of 78% efficient gas furnaces in 1992, it is important that the impact of these appliances be incorporated into gas peak demand modeling. This was done by utilizing the reduction in space heating requirements which would occur for a typical new or furnace-replacement customer on a peak-day.

Weather Analysis

In order to produce the demand forecast for a planning peak-day and for extreme and mild weather scenarios, weather assumptions had to be made. These assumptions were based on an analysis of daily weather from January 1981 to March 1994, plus an estimated gas demand associated with the weather occurring on each day. The weather statistics included HDD, prior day HDD, and wind speed, although the latter was not included for modeling purposes. The gas demand for each day was estimated using the daily forecasting models presented in Appendix F. It should be noted that HDD are based on an 8 a.m. – 8 a.m. day instead of the standard 12 a.m. – 12 a.m. basis. This transformation was done to more accurately match weather patterns with actual gas sendout, which is measured on the 8 a.m. – 8 a.m. basis.

For each year, the ten highest estimated gas demands and the weather associated with these demands were examined. Based on this data, it was decided that the average of the weather occurring for the five highest estimated demands would represent a typical peak day. These weather conditions are shown in Table 6 together with the corresponding gas demand forecast.

Table 6: Gas Demand Forecast (Mcf) for Weather Conditions Which Produced the 5 Largest Demand Values

Year	1	2	3	4	5
	HDD=49 Prior HDD=41 01/21/85	HDD=48 Prior HDD=39 12/25/83	HDD=45 Prior HDD=42 12/23/89	HDD=45 Prior HDD=45 01/11/82	HDD=46 Prior HDD=28 01/27/86
1994/95	320,874	312,441	292,458	294,232	291,436
1995/96	323,710	315,143	294,842	296,643	293,808
1996/97	326,289	317,596	296,998	298,826	295,947
1997/98	329,570	320,731	299,788	301,646	298,716
1998/99	333,311	324,313	302,997	304,889	301,903
1999/00	336,676	327,534	305,875	307,798	304,766
2000/01	339,713	330,436	308,461	310,413	307,330
2001/02	342,872	333,459	311,163	313,143	310,013
2002/03	345,964	336,419	313,808	315,817	312,639
2003/04	349,080	339,402	316,478	318,515	315,291
2004/05	352,064	342,258	319,034	321,098	317,830
2005/06	355,317	345,378	321,836	323,928	320,619
2006/07	358,262	348,199	324,365	326,483	323,131
2007/08	361,194	351,009	326,885	329,030	325,630
2008/09	364,140	353,833	329,420	331,591	328,150

There were no overlapping years for these five scenarios, with the weather conditions occurring in winters 1985, 1984, 1990, 1982 and 1986 for the forecast #1 through #5, respectively. This information further supported an average of these weather conditions as a reasonable choice for the typical peak-day.

In addition to the analysis of 8 a.m. to 8 a.m. HDD which were available for a 14 year period, 12 a.m. to 12 a.m. daily HDD values extending back for more than 46 years were also examined. This research supported the use of the five year average as typical peak-day weather. For example, analysis of available daily weather showed that five of the top ten days had 46 HDD, occupying the third through seventh positions. Furthermore, the two highest values occurred in the 1980's and are thus contained in the typical peak-day calculation.

The extreme weather scenario was based on the highest occurring HDD, which was the 49 HDD of January 21, 1985, also using the prior HDD of January 20 of 41. The mild weather scenario was based on the historical mildest weather occurring which produced an actual annual gas peak demand. This occurred on January 27, 1987, with HDD at 32 and prior day HDD of 31. The three scenarios associated with these weather conditions are those shown in Table 4.

Methodology Summary

The primary tool used to develop the peak demand forecast is regression analysis, which was used to relate daily firm gas usage to weather conditions, and also to analyze customer usage by specific customer types. Forecasts of customer categories are developed as part of the annual Corporate Planning budgeting process and are discussed in the Energy Sales documentation. Incorporation of customer detail into the forecast facilitates the analysis of DSM activities and efficiency changes for future impact studies.

The customer forecast for SCE&G is developed by class and rate, with the residential class further disaggregated by housing type. The customer forecast by groups is shown in Table 7. These customer categories allow for a more detailed analysis of average use, which varies significantly by customer group.

For each customer group, a regression model was developed which relates daily average usage to daily heating degree days. Since daily class/rate information is not available, monthly average use data was converted to a daily basis. This was done by dividing the monthly information by the number of days in each month. Model results for the seven daily average use regressions are shown in Appendix F. Consider the first equation shown, for residential single-family dwellings. The intercept of .347 implies a base load of almost 0.4 therms per day. The coefficient on DHDD of 0.228 similarly indicates that on average 0.2 therms are used per HDD for each day. Therefore, if 45 HDD is assumed as the expected weather, average usage per customer is calculated as follows:

$$DAVGT = 0.347 + (0.228 * 45)$$
$$= 10.607$$

Table 7: Historical and Forecast December Gas Customers 1991 – 2013

Year	Residential			Commercial		Industrial			Total
	SF	MF	MH	Small	Large	Small	Large	Transport	
1991	167,364	26,612	10,172	20,803	79	193	42	49	225,314
1992	171,137	27,854	9,997	21,309	60	193	34	49	230,633
1993	174,089	28,313	9,707	21,761	52	190	35	49	234,196
1994	177,175	28,848	9,536	22,299	50	190	32	48	238,178
1995	180,566	28,643	8,648	22,626	53	189	32	49	240,806
1996	182,741	29,004	8,974	23,000	54	190	32	49	244,044
1997	185,741	29,492	8,943	23,363	55	191	32	50	247,867
1998	189,060	30,021	8,910	23,752	56	192	32	50	252,073
1999	191,827	30,542	8,877	24,119	57	193	33	50	255,698
2000	194,551	31,055	8,844	24,494	57	194	33	50	259,278
2001	197,231	31,559	8,813	24,863	58	195	33	50	262,802
2002	199,869	32,056	8,781	25,218	59	196	33	51	266,263
2003	202,463	32,544	8,751	25,586	60	197	33	51	269,685
2004	204,970	33,016	8,721	25,935	61	197	33	51	272,984
2005	207,435	33,480	8,692	26,298	62	199	34	51	276,251
2006	209,813	33,927	8,663	26,657	63	200	34	52	279,409
2007	212,234	34,383	8,635	27,037	63	200	34	52	282,638
2008	214,568	34,822	8,607	27,393	64	201	34	52	285,741
2009	216,816	35,246	8,581	27,729	65	202	34	52	288,725
2010	219,108	35,677	8,554	28,091	66	202	34	52	291,784
2011	221,400	36,108	8,526	28,462	67	203	34	53	294,853
2012	223,734	36,548	8,499	28,850	68	204	34	53	297,990
2013	226,026	36,979	8,471	29,241	69	204	35	53	301,078

The average usage for a single family home on a day with 45 HDD would be 10.607 therms. A similar analysis was conducted on each customer group, with results falling in line with historical experience and expectations.

Adequate data was available to estimate regressions for all rates except firm transport for the commercial and industrial categories. This problem stems from the erratic usage patterns of these groups and their fairly short history. It was thus decided that commercial firm transport would follow the daily energy use model for large commercial firm, with industrial firm transport taking the pattern of small industrial firm. This was based on a comparison of these rates' average use for January 1994 and calendar year 1993 with the average use for the traditional sales groups.

The daily firm gas volumes for winter 1993/94 were further categorized into a large-user group and a small-user group. The former consisted of Rates 34 and 35, while the latter contained Rates 31 and 32. Since large users are less weather-sensitive than small users and have different growth patterns, this division allows for better analysis and forecasting.

An evaluation of these daily average use models was performed by comparing their results with the actual peak-day firm demand for winter 1993/94, which occurred on January 19. Average use per customer by category was updated using actual HDD, 42.25, and this value was multiplied by the average number of January customers to derive total demand. For the large-user group, actual peak-day use was 16,268 Mcf, while the daily use model predicted 16,223 Mcf, or an error of just 0.3%. The large-user category had actual use of 253,561 Mcf, versus a predicted 256,603 Mcf, a 1.2% difference. Based on this extremely tight fit between actual peak demand and that derived from the daily use models, data from these models can be used with confidence. The actual values are shown in Tables 1 & 2, Appendix G.

Although the daily average use models provide a very close approximation to peak demand, reliance on them alone is not appropriate. Most importantly, peak demand is not strictly a linear process. Instead, for SCE&G, as HDD increases from 30 to 35, there appears to be a distinct break-point, with gas demand growing sharply. This growth may be seen in Chart 1, Appendix G, which displays daily sendout versus HDD for the 1993/94 winter season. Also, statistical analysis shows that peak demand is impacted by prior day HDD in addition to current day HDD. Neither of these factors is captured by the average daily use models, therefore a daily sendout model was developed for the large-user and small-user categories which did incorporate these factors. These models are shown in Appendix F.

The final step in the model development process was to allocate the daily sendout model coefficients on a class/rate basis, thereby providing a basis for utilization of customer forecasts. Using the adjusted demand column from Tables 1 and 2, Appendix G, the percent each class contributes to the peak can be calculated. This is shown in the column labeled "% weights." In other words, 67.0% of the 1994 annual peak for small users can be attributed to the residential single family home category. Using the "% weights" and January 1994 customers, daily average use models by class/rate can be developed from the total daily use models of Appendix F. This process and the final values for the class/rate equations are shown in Table 3, Appendix G. The percentage weights from the daily average use model comparison with actual peak demand were first applied to the daily sendout model. These values were then put on a per customer basis by dividing them by January 1994 customers.

Incorporating Efficient Furnace Impacts

Beginning in January 1992, the National Appliance Energy Conservation Act mandated factory shipment of minimum 78% efficient furnaces. Therefore, sole reliance on the models developed from the existing customer base will overstate future peak demand, as most furnaces historically have been 64% efficient. A process was adopted to allow for the reduction in peak demand as more efficient furnaces penetrate the market.

The first step in this process was to separate total projected customers into three categories: existing, new, and replacement. Since existing customers maintain the stock of furnaces currently in place, the peak use models developed earlier may be used without modification. New customers, by law, must install furnaces with efficiencies of 78% or greater, and this group was calculated as the difference between the base year 1993 and all future customer additions. Replacement customers were estimated by assuming that 3.3% of existing customers will replace their 64% efficient furnace with a 78% efficient furnace each year.

The second step was the calculation of the reduction in peak demand when a higher-efficiency furnace is used. This was done by first estimating typical peak-day use for a residential single-family customer using the daily average use model described earlier. An estimate of water heater use for the peak-day was then subtracted out to provide space-heat only requirements. The decrease in load associated with a shift in furnace efficiency from 64% to 78% was calculated.

The single-family reduction in peak demand was used to proportionally adjust the commercial and industrial peak-day use. This proportion was adjusted to account for the fact that large customers have a greater proportion of their load in non-space-heating use. For small commercial users, instead of a 16.1% reduction in peak-day use, there was only an 8.5% reduction attributable to furnace replacement.

The last step in the forecast process was the application of the furnace efficiency reductions to their respective rates and customer categories using the assumed peak-day weather of 46.6 HDD for the current day and 39.0 HDD for prior day weather. These final results are shown in Table 4.

Impact of DSM Programs

This part of the report describes the estimated annual and peak-day sales impacts attributable to SCE&G's four primary DSM programs: Residential Water Heating, Residential Heating & Cooling, Residential New Business Programs, and Commercial Water Heating Program. The goals for customer participation in these programs are shown in Table 8.

Table 8: Projected Customer DSM Program Participation 1994 – 1998

	Residential			Commercial
Year	Water Heating	HVAC	New Business	Water Heating
1994	4,833	2,475	1,895	575
1995	4,236	2,625	1,975	595
1996	3,716	2,850	2,250	625
1997	3,175	2,975	2,300	630
1998	2,508	3,200	2,500	640

The projected impact on annual therm and peak-day load is shown in Table 9 on a per participant basis, and in Table 10 on a total combined program basis.

Table 9: Average Load Impact per Program Participant

	Residential			Commercial
	Water Heating	HVAC	New Business	Water Heating
Annual Therms	257	653	661	1,180
Peak-day Therms	0.84	8.79	7.15	3.49

Some of these DSM programs have been in place since the late 1980's and the projected impacts represent a continuation of past trends. Because the statistical and econometric models used to make the Company's sales forecast (as explained earlier in this section) are based on statistical correlation of past trends, program impacts are assumed to be implicit in the base case forecast.

Table 10: DSM Program Total Therm Impact

Year	Annual	Peak-day
1994	20,153,201	175,855
1995	24,966,758	218,695
1996	30,234,758	265,879
1997	35,494,833	314,117
1998	40,891,633	365,294
1999	40,891,633	365,294
2000	40,891,633	365,294
2001	40,891,633	365,294
2002	40,891,633	365,294
2003	40,891,633	365,294
2004	40,891,633	365,294
2005	40,891,633	365,294
2006	40,891,633	365,294
2007	40,891,633	365,294
2008	40,891,633	365,294

Section 3: Gas Supply Plan and Avoided Cost

Gas Supply Plan

Distribution System Description

SCE&G's gas distribution system consists of 5,506 miles of mains and 5,313 miles of services located throughout 32 counties in South Carolina. There are 119 delivery points through which gas is delivered into the distribution system. In 1977, SCE&G initiated a distribution system replacement project in Charleston. The success of that activity later led to an even larger replacement project in 1982 in Columbia and a smaller project in the acquired service area of Peoples Natural Gas. These projects replaced more than 850 miles of main and 60,000 services. As a result of this activity, the entire SCE&G system is now either plastic or cathodically protected coated steel. In addition, this project has reduced the unaccounted for gas from 3.16% in 1987 to under 2% currently.

SCE&G neither owns nor operates the pipeline system connecting these various delivery points. As illustrated in Figure 5, SCE&G receives gas from SCPC, which operates an intrastate transmission pipeline within the state of South Carolina.

Supply Mix

SCE&G has a contract with SCPC to provide all of its natural gas requirements with a current maximum contract demand of 196,595 DTS (or 191,800 Mcf) per day. In addition, SCE&G operates four propane air plants, which will be discussed in more detail later.

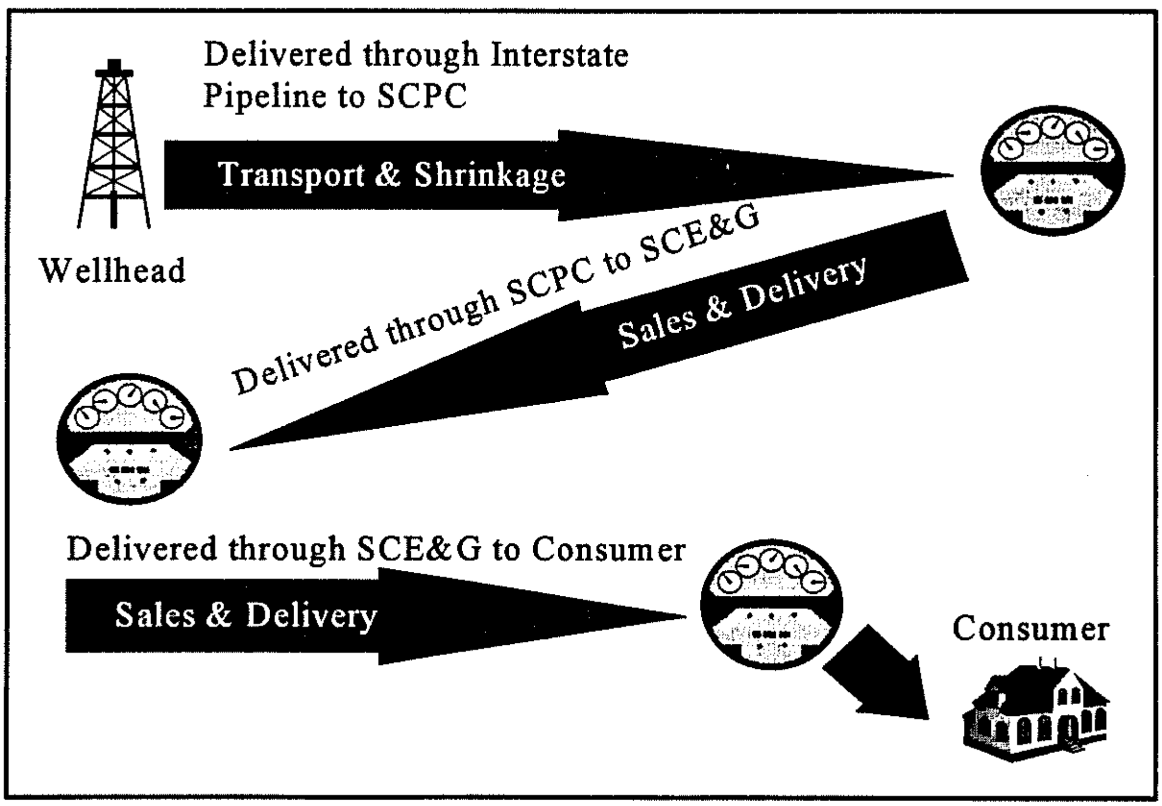
Purchases

Natural gas is purchased from SCPC under SCPSC approved tariffs DS-1 Distributor Service, which includes the Special Market Commodity Industrial Sales Program (i.e., Industrial Sales Program (ISP)), and DISS-1 Distributor Interruptible Supplemental Service. SCE&G's gas purchases are metered and invoiced by SCPC each month.

Purchased Supply Charges

Under these SCPSC approved tariffs, SCPC charges its sale-for-resale customers based on a two part demand/commodity rate structure. The gas cost and SCPC's cost of service revenue requirement are collected using a demand charge to recover fixed costs and a commodity charge to collect variable costs.

Figure 5: SCE&G's Gas Supply



Three Components of SCE&G's Gas Cost

The three components of SCE&G's gas cost are:

1. Costs paid for supplies at the wellhead
2. Costs paid to interstate pipelines to transport the gas to SCPC
3. SCPC's cost of service revenue requirements

With the implementation of FERC Order 636 in November 1993, supply costs (#1 above) are unregulated and determined by market conditions. Interstate pipeline charges (#2 above) continue to be regulated by FERC. The third component (SCPC's cost of service revenue requirement) remains under the SCPSC's jurisdiction.

SCE&G's Purchasing Practices

Since the wellhead supply costs are determined by the market and the charges for the interstate and the intrastate pipeline services are subject to federal and state regulation, there would be little, if any, change to the purchased gas cost if SCE&G were to become the purchaser of gas supplies. Changes to any one of the three basic components of SCE&G's gas cost are dependent on many other factors, and not just on whether SCE&G is the purchaser of gas supplies instead of SCPC. Therefore, at this time, it is felt that customers receive benefits as a result of this relationship.

Future Purchasing Considerations

The gas industry has gone through many changes historically and is still in an evolving state from the implementation of FERC Order 636 about a year ago. The ramifications of this gas industry restructuring are not yet fully known or understood and more changes are likely. In the future, as it has been our practice in the past, SCE&G will continue to monitor and assess changes associated with FERC Order 636 as well as other possible conditions that could affect our purchased gas supply cost and reliability. If changes occur that would affect these two criteria, SCE&G would make the appropriate decision regarding its purchased gas supply practices at that time.

Propane Air Plants

As already mentioned, SCE&G receives natural gas from SCPC with a contract demand of 196,595 DTS (or 191,800 Mcf) per day. In addition, SCE&G operates 4 propane air plants which have a total capacity of 104,550 DTS (or 102,000 Mcf) per day of natural gas equivalent for a total capacity of 301,145 DTS (or 293,800 Mcf) per day. These plants are maintained, professionally staffed and tested on a monthly basis to assure reliability when called upon to provide peaking during times when our firm load exceeds available natural gas supplies. Table 11 displays the output and the storage capacity of each plant. Based on a daily capacity of 102,000 Mcf, these plants can provide 4.2 days of supply.

Table 11: Output and Storage Capacity by Propane Air Plant

Plant	# of 60,000 Gallon Tanks	Available Gallons	Mcf of NG Equivalent	Daily Mcf Capacity in NG Equivalent
Lucias Road	40	2,040,000	181,223	50,000
Faber Place	45	2,295,000	203,876	42,000
N. Augusta	5	255,000	22,653	7,500
Ashley Phosphate	5	255,000	22,653	2,500
Total	95	4,845,000	430,405	102,000

SCE&G's Supply Strategy

SCE&G has estimated the 1994/95 firm peak design day for both typical and extreme weather conditions. The typical peak design day assumes 46.6 HDD based on analysis of daily weather in SCE&G's service area for the past 46 years (see Section 2). Based on the typical firm peak design day supply requirements, SCE&G has increased its contract demand (CD) by 27,675 DTS from its present level of 196,595 DTS per day to 224,270 DTS, effective November 1, 1994. This level of supply from SCPC together with an output of 92,250 DTS from the PAP facilities, would effectively meet the typical peak design day requirement. The extreme peak design day represents the weather profile of the coldest day on record in the 20th century, January 21, 1985. SCE&G's estimated 1994/95 extreme firm peak design day supply requirements could be met with a more stringent curtailment effort and maximum operation of the propane air plants. This is a situation that bears careful monitoring. In the future, as load grows, SCE&G will need to make new provisions to meet system load.

Avoided Costs

Avoided costs for SCE&G can be broken down into two major components: *gas supply avoided cost,* which includes commodity and deliverability from the wellhead by interstate pipelines, as well as the charges from the intrastate transmission pipeline; and the *distribution system avoided cost,* which can include the cost of the mains, services, and meters.

Gas Supply Avoided Cost

Currently for SCE&G, there are two supply options: contract demand service including sales and delivery service from SCPC, and four propane air plants.

The avoided demand supply costs for SCE&G was determined by developing a 12 month gas supply forecast incorporating the latest known and measurable cost changes along with other changes management has considered. The average cost for each dekatherm per year of additional capacity was calculated to be $181.20, or $18.12 per therm per year.

SCE&G's avoided commodity supply cost was based on SCPC's commodity costs for supply transported through Southern Natural Gas (SNG) and Transcontinental Gas Pipeline (Transco) were developed using New York Mercantile Exchange Futures (NYMEX) prices plus shrinkage, non-gas surcharges, and commodity mark-ups. The cost of gas determined by this forecast was calculated to be $2.44/dt. This price was based on SCE&G's current sales load profile, which produces approximately 80% of sales in winter months and 20% sales in summer months. Different usage patterns for different end-use applications produce different annual average prices with each DSM option tested.

Distribution System Avoided Costs

Distribution system avoided costs are estimates of the change in distribution system costs that result from the change in demand. SCE&G believes that these avoided costs are a useful tool for evaluating DSM activities.

System Improvement Projects

System improvement projects can be used to estimate SCE&G's distribution capacity costs. An engineering analysis was performed to estimate the system avoided distribution capacity cost, using projects capitalized in 1993. The approach used in determining the demand-related distribution system avoided costs was to tabulate the total investment of system improvement projects ($87,900) and divide by the 1994 forecast design peak-day growth (60,050 therms). The 1993 demand-related distribution avoided cost was calculated to be $1.46 per therm.

New Customers

Distribution facilities are influenced by two demand components; customers and peak-day design. Generally, services and meters would be installed as new customers are added; mains would also have to be extended to provide service to the customer. Mains are sized to accommodate the design day demands of the customers on that distribution network. Economies of scale are a large factor in the economics of building distribution systems because much of the cost of installing mains is the cost of trenching and not the pipe itself, so the incremental cost of increasing capacity (at the time of construction) can be relatively small. These economies of scale often dictate that local distribution expansions be designed to accommodate future growth.

The methodology used to determine the unit avoided cost of main investment for new business was to estimate the direct investment cost per customer and then calculate the annual carrying cost of the investment. For distribution system customer related facilities, the avoided cost was computed as the annual carrying cost associated with the service and meter. The 1993 cost of adding an average customer (main, service and meter) was $977.

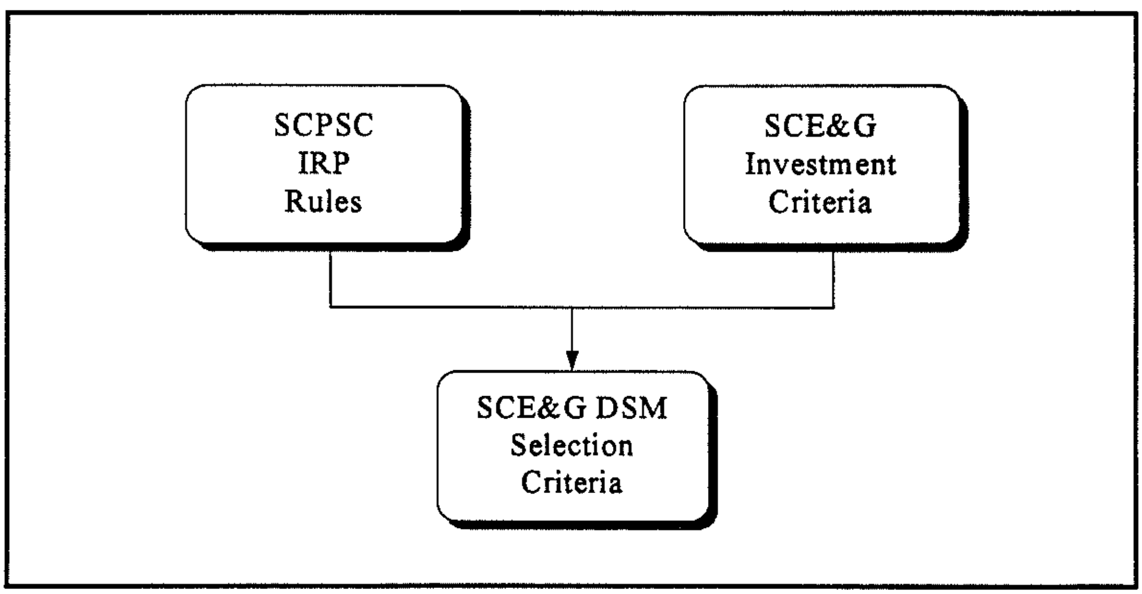
Section 4: DSM Options and Analysis

This section discusses the evaluation criteria and analytical methods used by SCE&G to screen DSM measures and programs.

Selection Criteria for DSM Programs

SCE&G's development of DSM screening and selection criteria focused on two major considerations (Figure 6): consistency with the SCPSC IRP rules as presented in Order 93-145; and consistency with Company criteria for new investment. The selection criteria guided the evaluation of the DSM opportunities.

Figure 6: SCE&G DSM Selection Criteria



Consistency with SCPSC IRP Rules

A uniform standard does not exist for applying the DSM benefit-cost test results in evaluation of DSM programs. However, the SCPSC rules (Order 93-145, Appendix A, dated February 8, 1993) provide guidance regarding the goals of the IRP process and the application of specific tests in specific situations. The IRP Objective Statement included in Order 93-145 gives clear indication that a major goal of the IRP is the minimization of the total costs of the utility's overall system:

The objective of the IRP process is the development of a plan that results in the minimization of the long run total costs of the utility's overall system and produces the least cost to the consumer consistent with the availability of an adequate and reliable supply of gas while maintaining system flexibility and considering environmental impacts. In conjunction with the overall objective, the IRP should contribute toward the outcomes of improved customer service, additional customer options, and improved efficiencies of energy utilization.

Section B.6 supports and further elaborates on the IRP Objective by stating:

The IRP filing must evaluate the cost effectiveness of each supply-side and demand-side option in a manner that considers relevant costs and benefits. To ensure proper evaluation, the screening of DSM resources can be based on more than one test. No single test is always appropriate for all situations. Each option must be evaluated, using the appropriate test or tests, and the analysis should include all appropriate costs.

In addition, section B.21 provides further insight:

The IRP must demonstrate that each utility is pursuing those resource options available for less than the avoided costs of new supply-side alternatives. Demand-side options will be included in the IRP to the extent they are cost effective and are consistent with the Commission objective statement for the IRP. Utility DSM plans shall give attention to capturing lost opportunity resources. These include those cost-effective *energy efficiency savings that can only be realized during a narrow time period, such as in new construction, renovation, and in routine replacement of existing equipment.*

SCE&G Economic Criteria

A second area SCE&G considered in developing the DSM program selection criteria was that all DSM initiatives make good economic sense to both the Company and ratepayers. This is the same criteria SCE&G uses in its day-to-day business decisions.

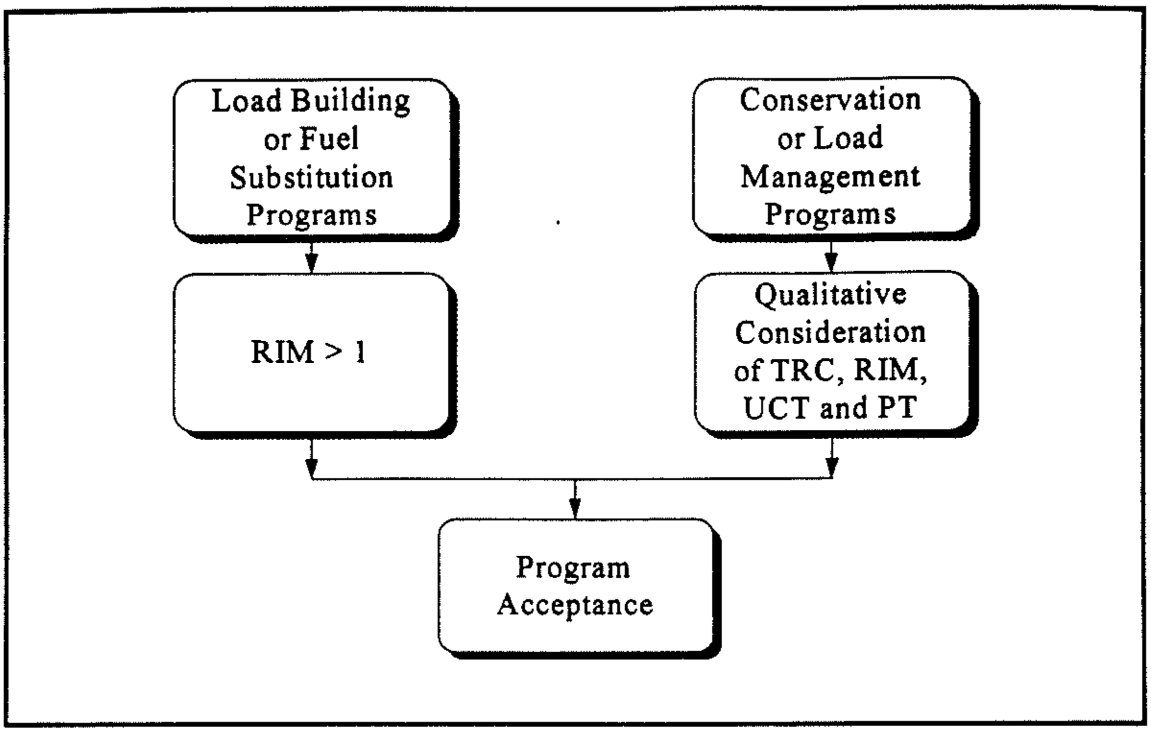
A third, yet related issue regards collecting, through the monthly basic facility charge, the full costs associated with service extensions, meter installations, and customer service related expenses. These non-energy related costs should be collected through the monthly basic facility charge (BFC). Energy related capacity and commodity costs should be collected through the energy charge. Company analyses suggest that on-going carrying charges associated with the fixed costs of connecting a customer plus the monthly customer cost of reading the meter and processing the account are not fully covered by the current $3.00 per month customer charge to residential customers. It is the Company's opinion that by designing rates which collect only energy/capacity related expenses through the energy/capacity component of the rate, DSM programs can be more fairly evaluated.

SCE&G DSM Evaluation and Program Selection Criteria

In consideration of the above, SCE&G has adopted the following criteria for evaluating potential DSM programs (Figure 7):

- *For load building and fuel substitution programs*, the RIM test results will be used to evaluate the program from a benefit-cost perspective.
- *For conservation and load management program*, the TRC, RIM, Utility, and Participant Test results will be used.

Figure 7: DSM Evaluation Criteria



Framework for Analysis

SCE&G's main objective in performing the DSM analysis is to evaluate and enhance DSM programs to better serve its customers. With this in mind, SCE&G utilized an end-use approach in determining the cost-effectiveness of alternative loads and a market segment approach to program implementation. The cost-effectiveness analysis used the standard DSM benefit-cost equations taking into account circumstances specific to SCE&G as discussed below.

DSM Cost-Effectiveness Tests

Four benefit-cost tests have been used to examine the cost-effectiveness of each utility DSM option/program. Each test examines the performance of options/programs from a different perspective. The benefit-cost equations were developed using the concepts embodied in the California Standard Practices Manual, *Economic Analysis of Demand-Side Management Programs*, December 1987. The SCE&G analysis takes into account circumstances particular to SCE&G. Specifically, for new customers this includes costs associated with the new gas service (i.e., mains, services, and meters), as well as revenues from the BFC. The reason these costs and benefits are normally not included is because on a present value basis they should be approximately equal. In South Carolina, however, the current $36.00 per year basic facility charge does not cover the costs of providing basic service and processing the account. Therefore, to compensate, both components were included, as appropriate, in the benefit-cost tests.

The four tests used in these analyses are the Total Resource Cost (TRC) Test, the Ratepayer Impact Measure (RIM) Test, the Utility Cost (UC) Test, and the Participant Test. The RIM Test is also commonly referred to as the Non-Participant Test, and the two terms may be used interchangeably throughout this report.

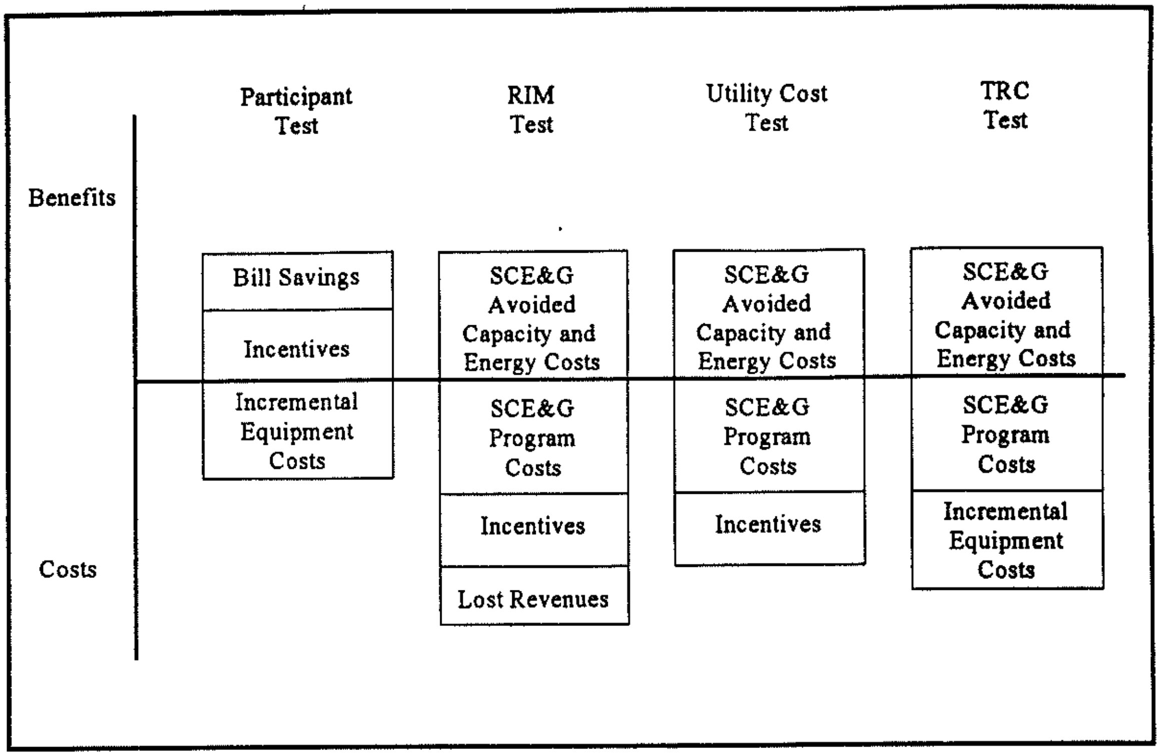
SCE&G also recognizes the specific circumstances in which the different tests should be used. For load-reducing measures, all four tests were applied. For load-increasing measures, only the RIM test was utilized. This is in keeping with our position to evaluate DSM measures based on their gas system impacts only.

Gas Load-Reducing Measures

All four standard benefit-cost tests apply to DSM measures that reduce the consumption of natural gas, such as weatherization and the installation of high-efficient natural gas appliances. The tests for load-reducing DSM measures, which assume no impact on the consumption of electricity, are shown in the Figure 8.

Each benefit-cost test evaluates the DSM measure from a different perspective. All test use life-cycle impacts of the measure, discounted to present value and expressed as a net present value amount and benefit-cost ratio. Net present value amounts greater than zero indicate that the measure has a positive benefit from the perspective of the particular test.

Figure 8: Load-Reducing Benefit-Costs Tests



- The *Participant Test* measures the quantifiable benefits and costs to the customer as a result of participating in a program. Participant benefits include the reduction in the customer's utility bill plus incentives. Participant costs include incremental customer costs incurred as a result of participating in the program. The test indicates whether participants receive a net reduction in the costs of energy service.

- The *Non-Participant Test* (RIM) reflects the change in customer bills or rates due to changes in utility revenues and operating costs caused by the DSM program. Benefits for the RIM test are the avoided supply costs attributed to the energy and capacity savings for each program. Costs for the RIM test are SCE&G's program costs and incentives paid to participants, and reduced revenues collected by SCE&G due to the energy savings. Program costs include all direct and indirect costs incurred by SCE&G to administer and implement the DSM program during the participation year.

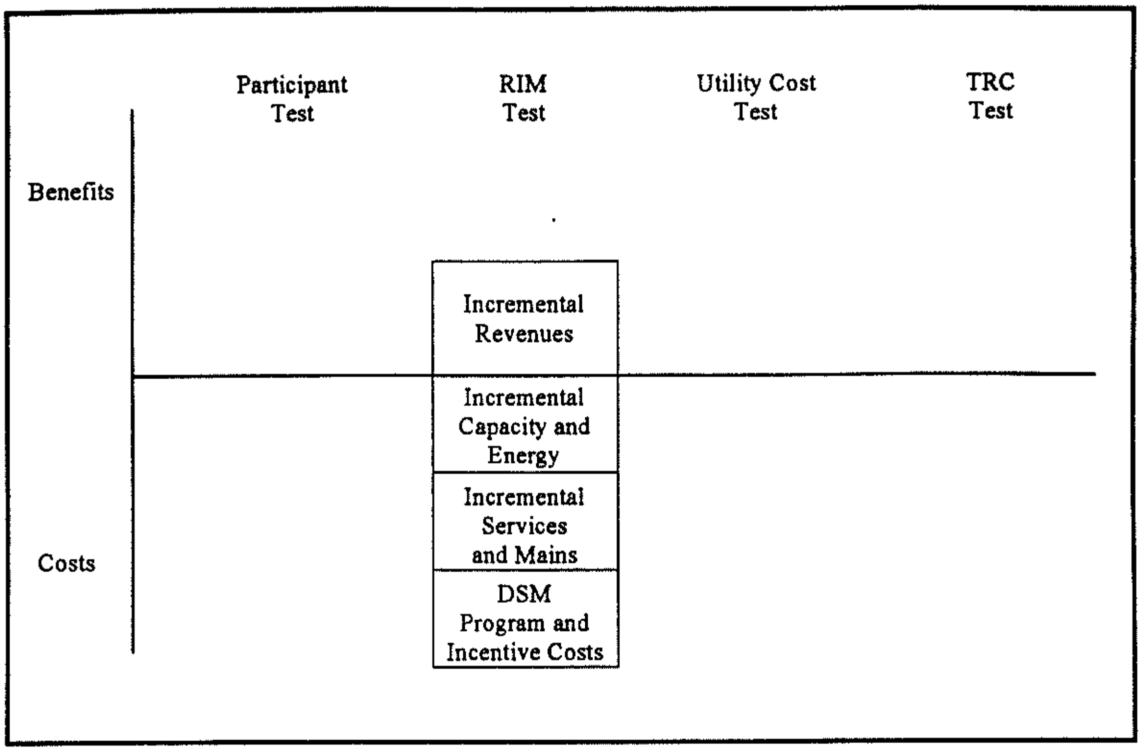
- The *Utility Cost Test* compares the reduction in supply costs with the cost of delivering the program. The Utility Cost Test differs from the RIM Test in that revenue losses are included in the RIM Test, but not included in the Utility Cost Test.

- The *Total Resource Cost Test* (TRC) combines the perspectives of the program participants and the non-participants. The test indicates whether the net value of resources needed to provide energy services is reduced. The test includes ratepayer and utility expenses, but excludes benefits and costs to other utilities, government bodies, and the rest of society.

Gas Load-Increasing Measures

DSM measures that increase the consumption of natural gas are difficult to evaluate with the standard tests. That is because the tangible benefits of such measures are not quantified by avoided cost savings, but rather greater economic activity or a higher standard of living. Thus, it is generally recognized that only the RIM Test is applicable to load-increasing measures. Applying only the RIM Test to load-increasing measures is consistent with SCE&G's position that the DSM evaluation should consider only the impact on the gas system. For load-increasing DSM measures, the RIM Test is defined as in Figure 9.

Figure 9: Load Increasing Benefit-Costs Tests



Analytical Approach

Separate analyses were performed for residential, commercial/industrial, and natural gas vehicle sectors. The following sections discuss the specific process for each sector.

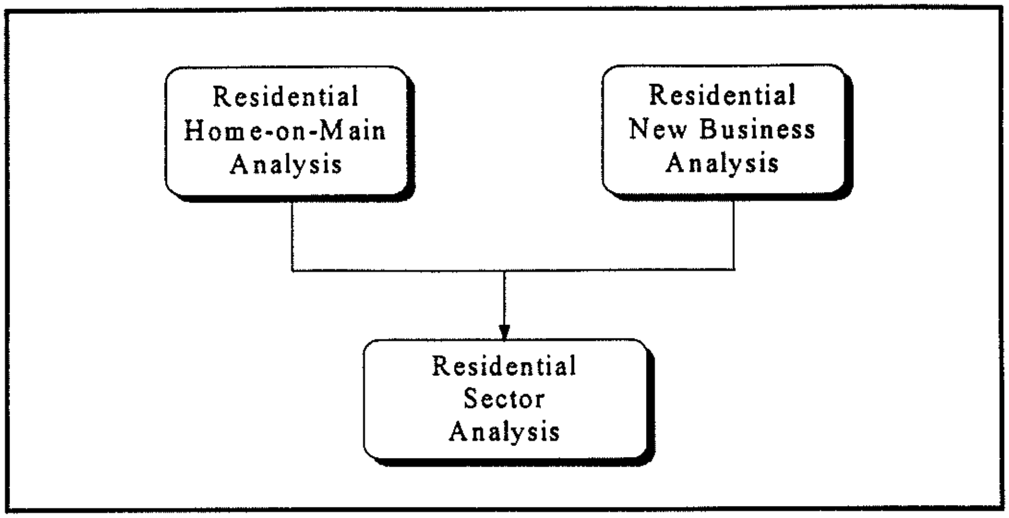
Residential Analysis

The residential analysis focused on the three principal means in which customers impact SCE&G's system:

1. Existing customers add or conserve load.
2. A home located on an existing main (but previously not a customer) installs a gas appliance and requests new service.
3. New customers join the system as a result of the distribution system extending to serve new geographic areas, subdivisions or communities.

One and two above were combined in our analysis because both represent homes on existing mains (Home-on-Main) and do not require SCE&G to make distribution system main capital investments in order to provide service. Item three represents new business requiring capital investments for main, services, and meters (Figure 10).

Figure 10: Residential Sector Analysis

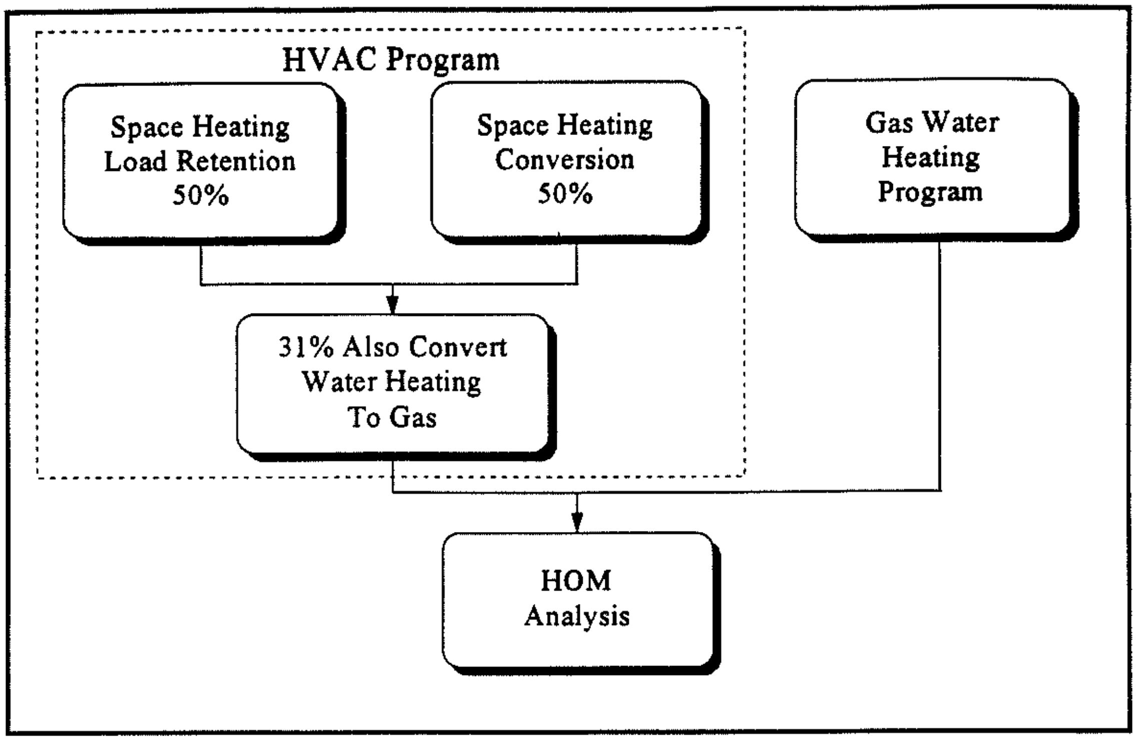


Therefore, the residential analysis was structured to replicate actual circumstances under which customers request and receive gas service from SCE&G.

Residential Home-on-Main (HOM) Analysis

The main thrust of the HOM program has been the water heater conversion program, resulting in over 60,000 conversions since 1988. The gas water heater is a good base load and has an excellent load factor. Approximately 80% of the water heater conversions were completed in homes with existing gas service, minimizing the need for new capital investment.

Figure 11: Residential Home-on-Main Analysis



An analysis of SCE&G's heating and cooling program shows that of those customers located on a gas main (i.e., a SCE&G gas main is located in the street adjacent to their home) who install new gas space heating equipment, half convert from other heating sources and half change-out existing gas-fired equipment. Of the 50% who convert, only about half require new service (i.e., a service connection from the street and a meter). Company records indicate that 95% of the space heating systems being installed are standard efficiency (78% AFUE) units, 1% are medium efficiency (about 84% AFUE) units, and 4% are high efficiency (92% AFUE) units. In addition to installing new space heating equipment, about 31% of those customers also convert their existing electric water heaters to natural gas thereby capturing additional savings in energy costs and additional convenience.

As a part of the HOM analysis, staff examined the cost-effectiveness of prototypical weatherization measures performed in existing dwellings. Two measures were reviewed: increasing ceiling insulation from R11 to R38, and adding storm windows and doors together with weather-stripping. The results shows that both measures fail the RIM test, yet pass the Participant test without the need for financial incentives from the Company. Currently about 75% of all SCE&G gas customers also purchase electricity through SCE&G's Electric Division. The Electric Division offers rebates to its customers for common weatherization measures including ceiling insulation, and storm windows and doors. The issue becomes whether to extend the program to gas-only customers, thereby perhaps duplicating similar programs being offered by those customers' electric suppliers.

Residential New Business Analysis

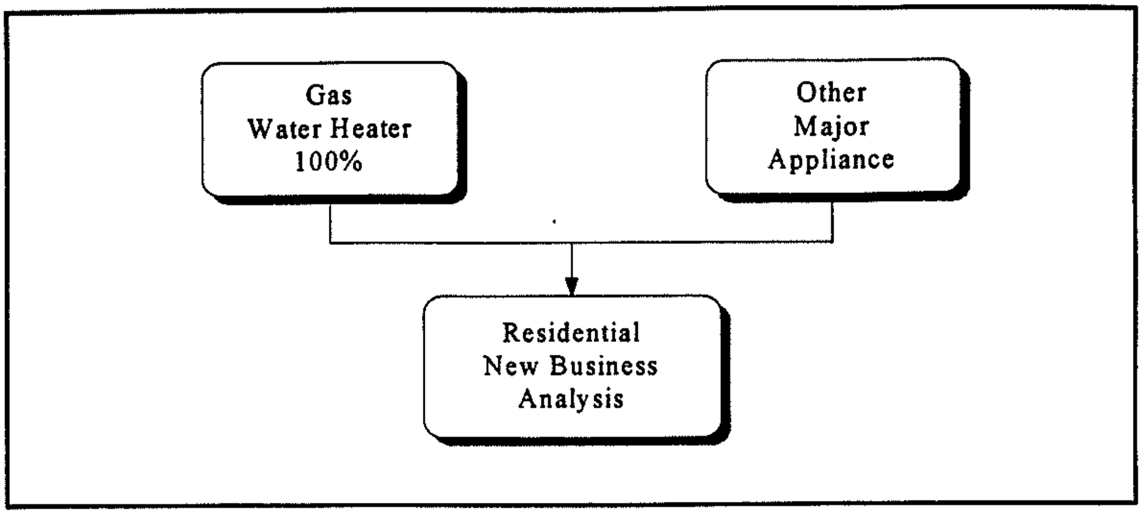
The residential new business analysis similarly reflects actual market circumstances. SCE&G's New Business Program provides an incentive to developers to install natural gas water heating and at least one other major gas appliance in each home. The other major appliances may include a range, clothes dryer, or HVAC. In analyzing the benefits and costs associated with the New Business Program, actual appliance market penetration statistics, as shown in Table 12, were used.

Table 12: New Business Gas Appliance Penetration

Water Heating	100%
HVAC	92%
Range	10%
Clothes Dryer	5%

Other characteristics of the new business analysis included specific recognition of the cost of new mains, services and meters, as well as the benefits associated with the Basic Facility Charge (BFC).

Figure 12: Residential New Business Analysis



Commercial/Industrial Analysis

The primary goal of the commercial/industrial analysis was to determine the cost-effectiveness of typical DSM opportunities. Principal commercial and industrial natural gas end-uses include water heating, food service, cooling, HVAC and industrial processes. The following DSM benefit-cost analysis were performed.

Commercial Water Heating

Four prototypical commercial water heating applications, based on load size, were analyzed:

- Commercial water heating up to 75,000 BTU/hour
- Commercial water heating 75,000 to 200,000 BTU/hour
- Commercial water heating 200,000 to 350,000 BTU/hour
- Commercial water heating greater than 350,000 BTU/hour

Commercial HVAC

- 25 ton gas heat with electric air conditioning

Commercial Food Service

Three major cooking end-uses were analyzed:

- Gas range and oven
- Deep fat fryer
- Convection oven

Commercial/Industrial Large-Scale Cooling/Refrigeration

Two major large-scale cooling/refrigeration application were analyzed:

- 500 ton engine driven chiller
- 500 ton absorption chiller

Natural Gas Vehicle

Growing concern over air quality and national energy security is focusing attention and legislation on emissions reductions through the use of alternative transportation fuels which are domestically abundant and environmentally benign. Natural gas is highly regarded as an alternative fuel because it is the cleanest burning fossil fuel and is in plentiful supply. Legislation requiring stringent emissions standards and decreased dependence on foreign oil are the driving forces instigating vehicle conversions from gasoline to alternative fuels. SCE&G's natural gas vehicle program was initiated in 1992. Initial goals of the program were to gain first-hand knowledge and experience through conversion of Company vehicles, the operation of those vehicles, and the operation of a NGV refueling facility. Another important component of a successful NGV program is the development of an equitable pricing and cost recovery mechanism for natural gas sold for use in non-company vehicles.

Recent legislation passed by the South Carolina General Assembly allows certain new enterprises, such as NGV sales, to be excluded from regulation. This legislation encourages the development of these enterprises and has effectively removed price determination at the compressed natural gas retail pump from SCPSC regulation. However, at the utility meter, the cost of purchased gas will still be subject to SCPSC jurisdiction. This service will be provided on an interruptible basis and the purchased gas cost component will be set monthly at the higher of the simple 12-month average commodity cost of gas or $0.29 per therm. Since the projected commodity cost of gas is $0.25 per therm, this should provide a credit to all firm customers for fixed demand charges. The distribution system markup is set based on the average interruptible markup, and any NGV sales go to offset fixed costs that would be otherwise be borne by firm customers.

SCE&G's DSM Screening and Roll-up Models

The screening of DSM measures was performed using two PC-based spreadsheet models developed at SCE&G for this IRP filing. The first model, the *DSM Screening Model*, performs the DSM benefit-cost analysis described above for each individual DSM measure. The second model, the *DSM Roll-up Model*, aggregates individual DSM measures appropriately to report results at the DSM program level.

DSM Screening Model

The *DSM Screening Model* is a PC-based spreadsheet which performs the life-cycle benefit-cost analysis for each individual DSM measure. Inputs to the model include each individual DSM measure's monthly energy usage, design peak-day demand usage, equipment purchase and installation costs, SCE&G's marginal supply and distribution capacity costs for each year of the study period, program administrative costs and participant incentives, and appropriate retail rate block positioning for marginal revenue calculations.

The model projects future costs and benefits to produce an assessment of the relative value (on a per unit basis) of the measure being evaluated. Future cost and benefit components for each applicable test (TRC, Utility, Participant, and RIM) are discounted to present value dollars using the appropriate discount rate (customer, utility, or societal) to yield net benefits.

DSM Roll-up Model

The *DSM Roll-up Model* combines related DSM measures and calculates present value net benefits at the DSM program level. The spreadsheet combines individual DSM measure per-unit net benefits (from the *DSM Screening Model*) and applies weighting factors based on projected participation rates. Total present value net benefits associated with each DSM program are calculated in order to provide a measure of the value of the DSM activity. The summary results from the DSM benefit-cost tests are displayed in Table 13.

Table 13: RIM Benefit-Cost Test Results

	NPV Per Participant (1993 $)			
	Benefits	Costs	Net Benefit	Benefit-Cost Ratio
Residential Home on Main				
Heating & Cooling	4,838	3,915	923	1.24
Water Heating	1,766	1,215	551	1.45
Total	2,929	2,236	693	1.31
Residential New Business	4,915	4,885	30	1.01
Commercial Water Heating				
Up to 75,000 BTU/hr.	6,813	4,009	2,804	1.70
75,000 - 200,000 BTU/hr.	10,504	5,705	4,798	1.84
200,000 - 350,000 BTU/hr.	26,225	12,414	13,811	2.11
Greater Than 350,000 BTU/hr.	34,623	16,082	19,541	2.15
Commercial Food Service				
Gas Range and Oven	8,733	4,404	4,329	1.98
Deep Fat Fryer	8,644	4,379	4,265	1.97
Convection Oven	3,013	1,956	1,057	1.54
Commercial HVAC				
25 Ton Gas Heat with Electric AC	14,857	14,437	420	1.03
Commercial/Industrial Large-Scale Cooling/Refrigeration				
500 Ton Engine Driven Chiller	315,038	201,111	113,927	1.57
500 Ton Absorption Chiller	471,073	296,268	174,805	1.59

The Residential Home-on-Main Program has two major components: the Gas Advantage Water Heater Program, and the Gas Advantage Heating & Cooling Program (HVAC). The Gas Advantage Water Heater Program was developed to meet customer needs. It is the backbone of SCE&G's residential DSM effort and provides enhanced customer service while building load factor. The success of the program has achieved national recognition. The Gas Advantage Heating and Cooling Program was designed to respond to customer needs, to encourage the use of higher efficiency equipment, and to foster better trade ally relations.

The Residential New Business Program was developed to provide customers the option of gas service in new growth areas. Working with developers and builders allows us to provide facilities so they may offer the comfort and convenience of natural gas and then these same facilities are available when commercial development, following residential development, locates in this growth area. The Gas Advantage New Business Program focuses on the installation of gas water heating coupled with one other major gas appliance.

The Commercial/Industrial DSM Programs (Figure 14) target both existing and new customers. The three commercial/industrial programs are the Commercial Water Heater Program, the Customized Commercial/Industrial Program, and the Natural Gas Vehicle Program. The NGV program is under development and SCE&G intends to file it with the SCPSC at a later date.

All of these programs represent existing, ongoing DSM activities by SCE&G. Table 14 displays five-year DSM program summary information including number of participants, total load impact, and program budgets for years 1994 through 1998.

A detailed description of each program follows.

Figure 14: Commercial/Industrial DSM Programs

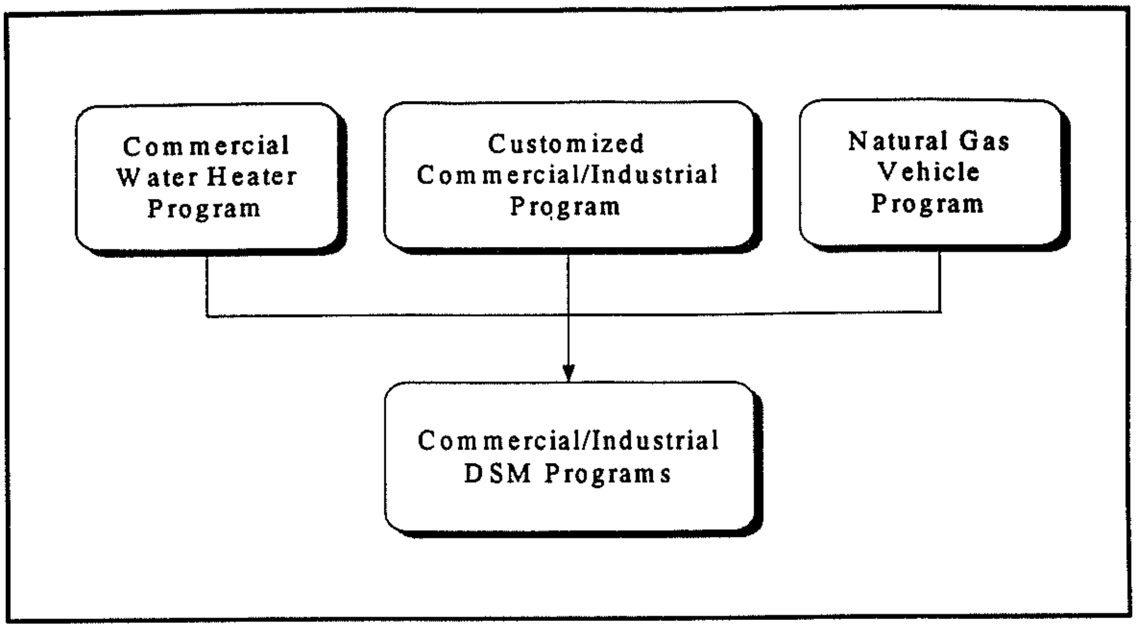


Table 14: Five-Year DSM Program Summary

	1994	1995	1996	1997	1998
Gas Advantage Water Heater					
Number of Participants	4,833	4,236	3,716	3,175	2,508
Total Impact (MThs)	1242.1	1088.7	955.0	816.0	644.6
Program Budget (1993 M$)	952.1	874.5	772.1	665.5	534.1
Gas Advantage Heating & Cooling					
Number of Participants	2,475	2,625	2,850	2,975	3,200
Total Impact (MThs)	1616.2	1714.1	1861.1	1942.7	2089.6
Program Budget (1993 M$)	311.9	360.8	389.1	404.9	433.2
Residential New Business					
Number of Participants	1,895	1,975	2,250	2,300	2,500
Total Impact (MThs)	1252.6	2262.2	1487.3	1520.3	1652.5
Program Budget (1993 M$)	524.9	577.1	653.3	667.1	722.5
Residential Total					
Number of Participants	9,203	8,836	8,816	8,450	8,208
Total Impact (MThs)	4110.9	5065.0	4303.3	4279.0	4386.7
Program Budget (1993 M$)	1788.9	1812.3	1814.4	1737.4	1689.8
Commercial Water Heating					
Number of Participants	575	595	625	630	640
Total Impact (MThs)	678.5	702.1	737.5	743.4	755.2
Program Budget (1993 M$)	278.3	317.9	332.5	334.9	339.7
Customized Commercial/Industrial					
Program Budget (1993 M$)	208.0	243.0	243.0	268.0	268.0
Industrial Process					
Program Budget (1993 M$)	50.0	110.0	110.0	110.0	110.0
Total DSM Program Budget (1993 M$)	2,325.2	2,483.2	2,499.9	2,450.3	2,407.5

Residential Programs

Program Name Gas Advantage Water Heater Program

Description of Program

The Gas Advantage Water Heater Program promotes the installation of energy efficient gas water heaters in homes located on existing gas mains. The water heater program, started in 1988, has accounted for over 60,000 water heater installations resulting in over 15,000,000 therms of additional, high load factor gas sales annually. The program increases customer awareness of the benefits of natural gas for water heating while maximizing the usage of existing gas mains. The program offers same-day service for leakers and includes a money-back guarantee. Water heater parts and labor are guaranteed for two years from the date of installation.

Description of Target Customers

The Gas Advantage Water Heater Program is offered to owners of homes located on existing Company mains who are currently using any alternative non-gas fuel source for water heating.

Incentives

A $200 rebate is available for the replacement of any alternative fuel source water heater to an energy efficient natural gas water heater. If two or more water heaters are installed, the rebate is $250. Property owners, except landlords, are eligible for optional 15% financing for 24 or 36 months.

An option allows the customer to lease the water heater from SCE&G. For a set monthly fee, SCE&G will provide all service and maintenance for the water heater for the duration of the 60 month lease.

Program Name Gas Advantage Water Heater Program (Continued)

Marketing and Implementation Plan

Advertising campaigns through local media are being supplemented by direct mail via bill inserts. Trade ally education and promotions are also being employed. Attractive educational and promotional materials are used to further supplement media efforts. Promotional events, seminars, and demonstrations are used to build awareness and commitment among builders, distributors, and other retail trade allies.

Evaluation Plan (Impact and Process Evaluations)

A detailed evaluation plan will be developed and submitted at a later date.

Impact Per Participant

Average annual gas use for water heating is estimated to be 257 therms. The average contribution to peak-day requirements is estimated to be 0.84 therm.

Number of Participants Per Year

	1994	1995	1996	1997	1998
Participation	4,833	4,236	3,716	3,175	2,508

Measure Life

Water heaters have life expectancy of 15 years.

Annual Program Budget (1993 $)

	1994	1995	1996	1997	1998
Labor	478,467	419,364	367,884	314,325	248,292
Incentives	434,970	381,240	334,440	285,750	225,720
Marketing	38,664	33,888	29,728	25,400	20,064
Evaluation		40,000	40,000	40,000	40,000
Total	952,101	874,492	772,052	665,475	534,076

Program Name Gas Advantage Heating & Cooling Program

Description of Program

The Gas Advantage Heating & Cooling Program promotes the installation of energy efficient gas heating and cooling in homes located on existing gas mains. The program is designed to increase customer awareness of the benefits of natural gas for space conditioning and water heating while maximizing the usage of existing gas mains. The program also strengthens relationships with heating and cooling dealers by providing technical and marketing support.

Another objective of the program is to educate customers on the numerous merits of natural gas cooling and to encourage the installation of gas-fired cooling equipment. New technologies have made this a viable option for many residential customers.

Description of Target Customers

The Gas Advantage Heating & Cooling Program is offered to homeowners located on existing Company mains who are currently using any alternative non-gas fuel source for space conditioning

Program Name Gas Advantage Heating & Cooling Program (Continued)

Financing/Incentives

Equipment and installation costs for gas central HVAC systems of 40,000 BTU and higher can be financed and added to the customer's energy bill as follows:

Maximum amount of financing:	$7,500

Annual percentage rates:

Equipment up to 82% AFUE	12%
Equipment 83%-89% AFUE	9%
Equipment 90% and greater AFUE	6%

The customer can buy down financing to the next lower level if he has an existing gas water heater or by installing a gas water in addition to the HVAC system. Terms are 24, 36, 48 or 60 months. Off-peak retail gas cooling rates are also available for customers.

Marketing and Implementation Plan

Media campaigns through local sources are supplemented by direct mail advertising via bill inserts. Trade ally education and promotions are also employed. Attractive educational and promotional materials are used to further supplement media efforts. Promotional events, seminars, and demonstrations are used to build awareness and commitment among builders, distributors, and retail trade allies.

Evaluation Plan (Impact and Process Evaluations)

A detailed evaluation plan will be developed and submitted at a later date.

Impact Per Participant

Average annual gas use is estimated to be 653 therms[1]. The average contribution to peak-day requirements is estimated to be 8.79 therms[1].

Number of Participants Per Year

	1994	1995	1996	1997	1998
Participation	2,475	2,625	2,850	2,975	3,200

Measure Life

Gas furnaces have life expectancy of 20 years.

Annual Program Budget[1] (1993 $)

	1994	1995	1996	1997	1998
Labor	183,150	194,250	210,900	220,150	236,800
Incentives	108,900	115,500	125,400	130,900	140,800
Marketing	19,800	21,000	22,800	23,800	25,600
Evaluation		30,000	30,000	30,000	30,000
Total	311,850	360,750	389,100	404,850	433,200

(1) Reflects the 31% who also install gas water heating.

Program Name Residential New Business Program

Description of Program

The Gas Advantage New Business Program promotes the installation of energy efficient gas water heaters together with one additional major natural gas appliance in homes being built in new developments. Qualifying major gas appliances include a clothes dryer, range, and HVAC.

Description of Target Customers

The Gas Advantage New Business Program is offered to builders and developers of homes in new subdivisions.

Incentives

A $200 per home piping and venting allowance is given to builders who install a gas water heater and one additional major appliance. The builder can qualify for an additional $100 ($300 total) allowance by installing gas cooling in addition to the water heater and major other appliance. Each home allowance may be redeemed in one of three way:

- Free appliance up to the allowance
- House piping up to the allowance
- Direct payment for allowance amount

In addition, a co-op advertising incentive is accrued in the builder's account. SCE&G pays 50% of the net media cost for all approved advertising, up to the amount in the builder's account.

Program Name Residential New Business Program (Continued)

Marketing and Implementation Plan

Trade ally education and promotional efforts are employed (Home Builder's Association, realtor groups, HVAC contractors, etc.). Attractive educational and promotional materials are used to further supplement co-op media efforts. Promotional events, seminars, and demonstrations are used to build awareness and commitment among builders and developers.

Evaluation Plan (Impact and Process Evaluations)

A detailed evaluation plan will be developed and submitted at a later date.

Impact Per Participant

Average annual therm use by appliance is estimated to be as follows:

Water Heating	257
Space Heating[1] - 78% AFUE	360
Space Heating[1] - 84% AFUE	335
Space Heating[1] - 92% AFUE	307
Dryers	42
Range	82
Cooling	289

(1) Assumes an 1,800 square foot home insulated to South Carolina state standards.

Program Name Residential New Business Program (Continued)

Number of Participants Per Year

	1994	1995	1996	1997	1998
Participation	1,895	1,975	2,250	2,300	2,500

Measure Life (Years)

Water Heating	15
Space Heating - 78% AFUE	20
Space Heating - 84% AFUE	20
Space Heating - 92% AFUE	20
Dryers	10
Range	10
Cooling	20

Annual Program Budget (1993 $)

	1994	1995	1996	1997	1998
Labor	267,195	278,475	317,250	324,300	352,500
Incentives	223,610	233,050	265,500	271,400	295,000
Marketing	34,110	35,550	40,500	41,400	45,000
Evaluation		30,000	30,000	30,000	30,000
Total	524,915	577,075	653,250	667,100	722,500

Commercial/Industrial Programs

Program Name Commercial Water Heater Program

Description of Program

The Commercial Water Heater Program promotes the installation of energy efficient gas water heaters in commercial buildings located on existing gas mains. Incentives are offered for customers to convert to natural gas or to upgrade existing natural gas water heating equipment to new, high-efficient models. The program is designed to increase customer awareness of the benefits of natural gas for water heating while maximizing the usage of existing mains. The program will also strengthen relationships with water heating contractors by providing technical and marketing support. The commercial water heater program, started in 1991, has helped increase our overall system utilization thereby minimizing rates.

Description of Target Customers

The Commercial Water Heater Program is offered to owners of commercial buildings located on existing Company mains. Specific businesses to be targeted include:

- Restaurants
- Hotels/Motels
- Hospitals
- Laundries
- Spas
- Hair Salons
- Nursing Homes
- Schools
- Car Washes

Program Name Commercial Water Heater Program (Continued)

Incentives

For water heating conversions, the customer has the option of 0% financing for two years, or 15% financing for up to five years together with a cash rebate based on the following scale:

Less than 75,000 BTUH	$200
75,001 - 200,000 BTUH	400
200,001 - 350,000 BTUH	600
Greater than 350,000 BTUH	800

Gas-to-gas change outs are not eligible for the rebate but may be financed at 15% interest for 24- or 36-months.

Marketing and Implementation Plan

SCE&G promotes this program in a variety of ways including:

Direct Customer Contact - SCE&G marketing/DSM staff is used to meet with customers to explain the benefits of the program. Company staff participates in necessary training to enhance understanding of potential water heating conversion opportunities.

Trade Ally Involvement - Trade allies represent an extension of the Company's personnel to provide information to customers about the program and assist with the development of the market. The Company encourages the active participation of trade allies, including equipment vendors, manufacturing representatives, and service facilities. Participation in regional association meetings are used to strengthen the Company's contacts in this market segment and for disseminating information.

Program Name Commercial Water Heater Program (Continued)

Media Utilization - SCE&G uses media and marketing information channels, as appropriate, to assure that customers are aware of the benefits from participation in the program.

Evaluation Plan (Impact and Process Evaluations)

A detailed evaluation plan will be developed and submitted at a later date.

Impact Per Participant

Average annual gas use for commercial water heating is estimated to be 1,180 therms. The average contribution to peak-day requirements is estimated to be 3.49 therms.

Number of Participants Per Year

	1994	1995	1996	1997	1998
Participation	575	595	625	630	640

Measure Life

Commercial water heaters are expected to have a life expectancy of 15 years.

Annual Program Budget (1993 $)

	1994	1995	1996	1997	1998
Labor	168,266	174,119	182,898	184,361	187,288
Incentives	110,003	113,829	119,569	120,525	122,438
Marketing		10,000	10,000	10,000	10,000
Evaluation		20,000	20,000	20,000	20,000
Total	278,269	317,948	332,467	334,886	339,726

Program Name Customized Commercial/Industrial Program

Description of Program

The Customized Commercial/Industrial Program is designed to address the energy requirements of C & I customers in the most energy-efficient and cost-effective manner. C & I customers have unique and highly technical needs for energy services. As a result, the program is designed to be flexible in meeting each customer's unique needs.

The DSM measures offered include energy audits, design assistance, cost-effective weatherization measures, and energy-efficient natural gas equipment. The type of equipment covered under this program includes heating, cooling, cooking, and refrigeration.

Due to the large number of customers and the diversity of their end-use requirements, the Customized Commercial/Industrial Program must be flexible to accommodate each customer's unique and special needs. Under this program SCE&G calculates the benefits of each specific energy measure to participants as well as other ratepayers. SCE&G then tailors the incentive plan to meet each participant's specific needs.

Description of Target Customers

The Customized Commercial/Industrial Program targets C & I customers who currently use, or plan to use, alternative fuels for end-use applications where cost-effective gas technologies exist. The principle screening criteria is the RIM test. For a DSM option to qualify under this program, it must have a RIM benefit-cost ratio greater than 1.0.

Program Name Customized Commercial/Industrial Program (Continued)

Incentives

For each qualifying DSM measure, the program offers 9% financing on up to $50,000 for natural gas cooling conversions. For gas change-outs, financing is available at 12% on up to $50,000. Terms are for 2, 3, 4, or 5 year. For cooling conversions from electricity, a $100/kW deferred rebate is also currently available through SCE&G's Electric Department. In addition, incentive rates have also been established for all customer sectors that utilize gas cooling. Additional incentives may be available on a case-by-case basis depending on cost effectiveness. Rebates may be offered to offset the customer's initial capital cost associated with the new equipment. Such rebates would consider actual Company costs to serve and potential future revenues.

Marketing and Implementation Plan

SCE&G promotes this program in a variety of ways including:

Direct Customer Contact - SCE&G marketing/DSM staff is used to meet with customers to explain the benefits of the program. Company staff participates in necessary training to enhance understanding of potential DSM opportunities.

Trade Ally Involvement - Trade allies represent an extension of the Company's personnel to provide information to customers about the program and assist with the development of the market. The Company encourages the active participation of trade allies, including equipment vendors, manufacturing representatives, and service facilities. Participation in regional association meetings are used to strengthen the Company's contacts in this market segment and for disseminating information.

Media Utilization - SCE&G uses media and marketing information channels, as appropriate, to assure that customers are aware of the benefits from participation in the program.

In addition, to ensure a high level of program success, SCE&G performs ongoing quality control including:

- Installation Verification
- Customer Satisfaction Monitoring
- Trade Ally Meetings

Evaluation Plan (Impact and Process Evaluations)

A detailed evaluation plan will be developed and submitted at a later date.

Annual Program Budget (1993 $)

	1994	1995	1996	1997	1998
Labor	183,000	183,000	183,000	183,000	183,000
Incentives	25,000	50,000	50,000	75,000	75,000
Marketing		10,000	10,000	10,000	10,000
Evaluation		10,000	10,000	10,000	10,000
Total	208,000	243,000	243,000	268,000	268,000

Program Name Industrial Process Program

Description of Program

The Industrial Process Program provides technical and financial assistance to industrial customers to make capital improvements to their manufacturing processes which result in productivity improvements for them and gas system utilization improvements for SCE&G.

Description of Target Customers

Industrial gas customers of SCE&G.

Incentives

Incentives are determined on a case by case basis consistent with other SCE&G investment return criteria.

Marketing Plan and Implementation Plan

SCE&G marketing/DSM personnel maintain contact with key personnel in all industries within our service area. We've developed a closer alliance with GRI (Gas Research Institute) and have established incentives for our industrial customers to utilize GRI developed technologies. We promote the use of interruptible natural gas to existing low load factor large firm commercial and industrial customers where beneficial to both the customer and the Company. We aggressively pursue the displacement of coal by our customers.

Evaluation Plan (Impact and Process Evaluations)

A detailed evaluation plan will be developed and submitted at a later date.

Program Name Industrial Process Program (Continued)

Annual Program Budget (1993 $)

	1994	1995	1996	1997	1998
Labor	50,000	75,000	75,000	75,000	75,000
Incentives		25,000	25,000	25,000	25,000
Marketing		5,000	5,000	5,000	5,000
Evaluation		5,000	5,000	5,000	5,000
Total	50,000	110,000	110,000	110,000	110,000

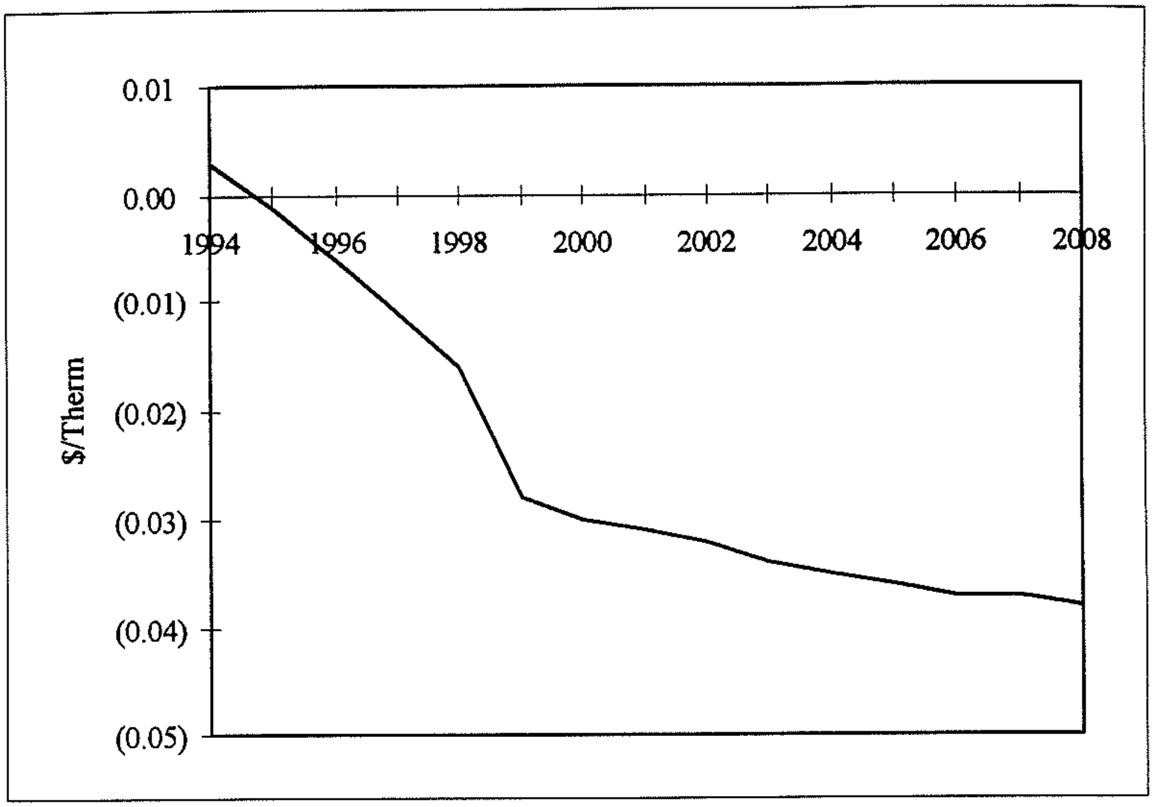
Section 6: Financial/Rate Impact Analysis

For the financial/rate impact analysis, SCE&G staff adjusted the 15 year forecast of revenue requirements and firm sales as a result of the estimated impact from a five year operation of the DSM programs. Table 15 shows the impact the DSM programs are expected to have on average revenue requirements per therm for years 1994 through 2008. Although average revenue requirements increase slightly in year 1994, they are lower during the remainder of the planning period. These results are displayed graphically in Figure 15.

Table 15: Revenue Requirement Impact From DSM Programs ($/Therm)

Year	DSM Impact ($/Therm)
1994	0.003
1995	(0.001)
1996	(0.006)
1997	(0.011)
1998	(0.016)
1999	(0.028)
2000	(0.030)
2001	(0.031)
2002	(0.032)
2003	(0.034)
2004	(0.035)
2005	(0.036)
2006	(0.037)
2007	(0.037)
2008	(0.038)

Figure 15: Incremental Revenue Requirement Impact From DSM Programs



Section 7: Risk Assessment

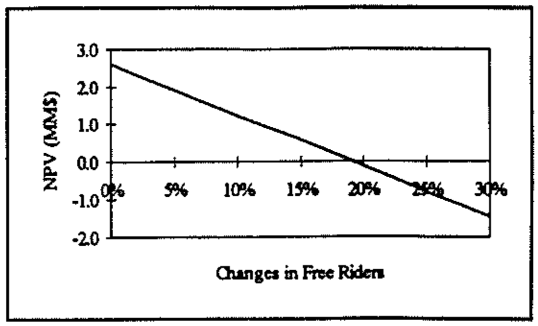
There are many factors which contribute to uncertainty in the IRP process. In an attempt to quantify some of these uncertainties, SCE&G did a detailed sensitivity analysis of the potential impact three specific variables could have on the cost effectiveness of the residential programs. The three variables examined were: free riders, gas avoided costs, and program expenses. Figures 16, 17, and 18 illustrate the results of these analyses.

Figure 16: Free Rider Sensitivity Analysis

Heating & Cooling Program

Benefits - Costs		
% Adjust.	RIM Gas Only	Percent Change
Base = 0%	$2,608,562	-
5%	$1,927,635	-26.10%
10%	$1,246,708	-52.21%
15%	$565,781	-78.31%
20%	($115,146)	-104.41%
25%	($796,073)	-130.52%
30%	($1,476,999)	-156.62%

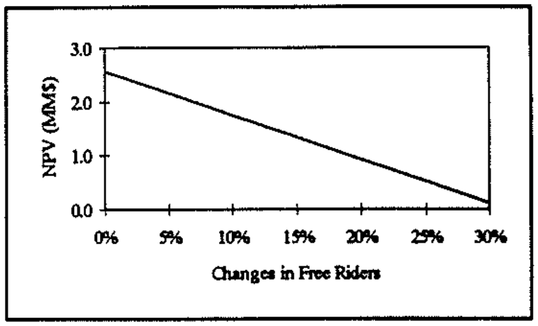
Heating & Cooling Program



Gas Water Heater Program

Benefits - Costs		
% Adjust.	RIM Gas Only	Percent Change
Base = 0%	$2,550,604	-
5%	$2,142,261	-16.01%
10%	$1,733,918	-32.02%
15%	$1,325,576	-48.03%
20%	$917,233	-64.04%
25%	$508,890	-80.05%
30%	$100,547	-96.06%

Gas Water Heater Program



New Business Program

Benefits - Costs		
% Adjust.	RIM Gas Only	Percent Change
Base = 0%	$60,416	-
5%	($418,287)	-0,792.34%
10%	($896,990)	-1,584.69%
15%	($1,375,692)	-2,377.03%
20%	($1,854,395)	-3,169.38%
25%	($2,333,098)	-3,961.72%
30%	($2,811,801)	-4,754.07%

New Business Program

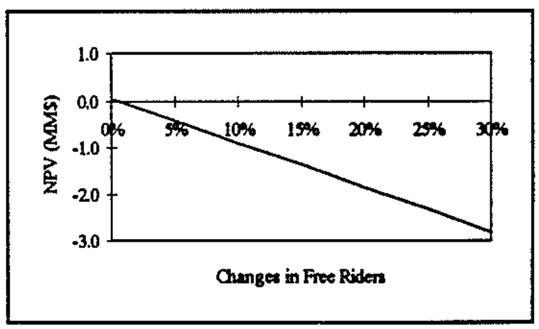
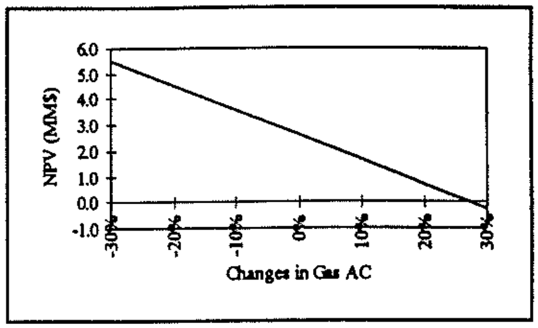


Figure 17: Gas Avoided Cost Sensitivity Analysis

Heating & Cooling Program

	Benefits - Costs	
% Adjust.	RIM Gas Only	Percent Change
Base = 0%	$2,608,562	-
30%	($263,658)	-110.11%
20%	$693,749	-73.40%
10%	$1,651,155	-36.70%
-10%	$3,565,969	36.70%
-20%	$4,523,377	73.41%
-30%	$5,480,782	110.11%

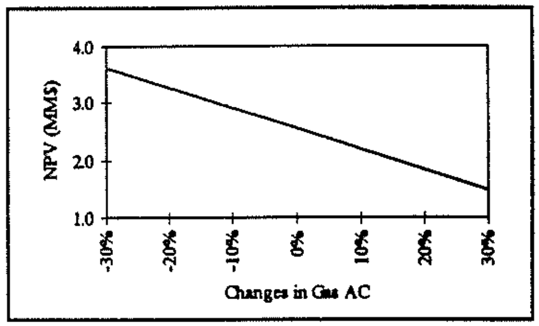
Heating & Cooling Program



Gas Water Heater Program

	Benefits - Costs	
% Adjust.	RIM Gas Only	Percent Change
Base = 0%	$2,550,604	-
30%	$1,480,320	-41.96%
20%	$1,837,082	-27.97%
10%	$2,193,843	-13.99%
-10%	$2,907,366	13.99%
-20%	$3,264,128	27.97%
-30%	$3,620,890	41.96%

Gas Water Heating Program



New Business Program

	Benefits - Costs	
% Adjust.	RIM Gas Only	Percent Change
Base = 0%	$60,416	-
30%	($1,714,470)	-2,937.77%
20%	($1,122,842)	-1,958.52%
10%	($531,214)	-0,979.26%
-10%	$652,043	0,979.26%
-20%	$1,243,671	1,958.51%
-30%	$1,835,299	2,937.77%

New Business Program

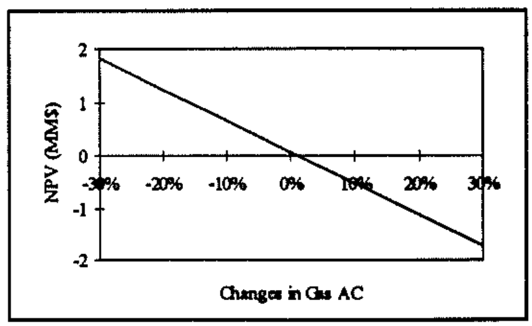
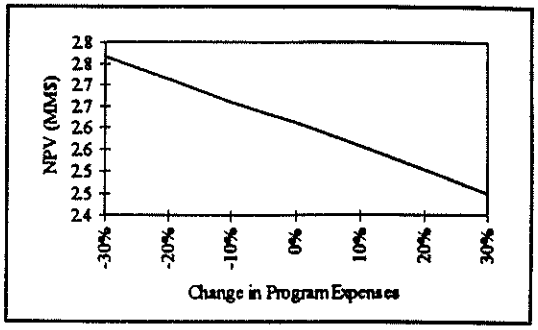


Figure 18: Program Expense Sensitivity Analysis

Heating & Cooling Program

Benefits - Costs		
% Adjust.	RIM Gas Only	Percent Change
Base = 0%	$2,608,562	-
30%	$2,449,538	-6.10%
20%	$2,502,547	-4.06%
10%	$2,555,554	-2.03%
-10%	$2,661,570	2.03%
-20%	$2,714,579	4.06%
-30%	$2,767,587	6.10%

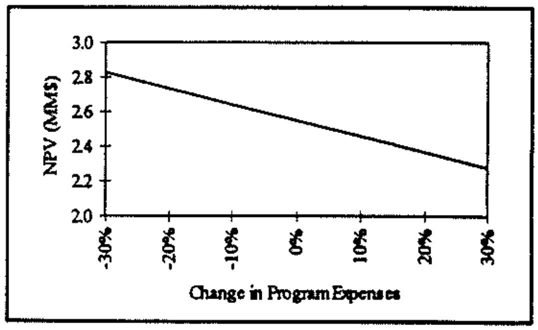
Heating & Cooling Program



Gas Water Heater Program

Benefits - Costs		
% Adjust.	RIM Gas Only	Percent Change
Base = 0%	$2,550,604	-
30%	$2,276,967	-10.73%
20%	$2,368,180	-7.15%
10%	$2,459,392	-3.58%
-10%	$2,641,817	3.58%
-20%	$2,733,030	7.15%
-30%	$2,824,242	10.73%

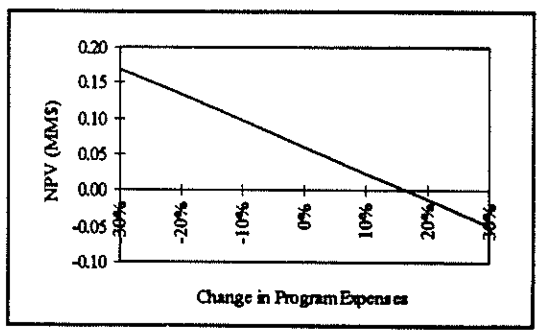
Gas Water Heater Program



New Business Program

Benefits - Costs		
% Adjust.	RIM Gas Only	Percent Change
Base = 0%	$60,416	-
30%	($48,846)	-180.85%
20%	($12,426)	-120.57%
10%	$23,994	-60.29%
-10%	$96,835	60.28%
-20%	$133,255	120.56%
-30%	$169,675	180.84%

New Business Program



Section 8: Regulatory Issues

There are many aspects of this IRP which impact the manner in which SCE&G interacts with its customers and the SCPSC. The DSM activities included in this report are designed to result in financial and lifestyle benefits to SCE&G gas customers. SCE&G feels recovery of costs associated with the IRP related activities (i.e., preparation of the filing and direct costs of the DSM programs) should be addressed in future rate proceedings.

Section 9: Near-Term Action Plan

During 1995, SCE&G will focus its IRP efforts in four major areas:

- Continue implementing existing DSM programs
- Develop and initiate a DSM measurement and evaluation process
- Redesign rates to recover more customer related costs in the BFC
- Seek cost recovery of IRP/DSM activities in future rate proceedings

Continue Implementing Existing DSM Programs

As stated earlier, the DSM programs included in this IRP are programs the Company is already implementing in the marketplace. SCE&G intends to continue implementing these programs until such time that it feels the benefits do not justify the costs. The proposed measurement and evaluation activities, together with market research and other pertinent information, will assist management in making that determination.

Develop and Initiate a DSM Measurement and Evaluation Process

SCE&G will develop an appropriate measurement and evaluation (M&E) plan to further evaluate the cost effectiveness of the DSM programs included in this IRP. The M&E plan will address appropriate impact and process evaluation activities SCE&G intends to perform.

Redesign Rates to Recover More Customer Related Costs in the BFC

For the reasons cited earlier in this report, SCE&G hopes to work with the SCPSC staff in realigning the retail rate structure to more closely match current costs. The issue of specific focus will be to establish a fixed monthly basic facility charge which more closely recovers the costs of service extensions, meter installations, and customer billing related expenses. It is the Company's opinion that by designing rates which collect energy and capacity related costs through the energy/capacity component and fixed monthly charges through the basic facility charge, customers will receive proper price signals and DSM options/programs can be more fairly evaluated.

Seek Cost Recovery of IRP/DSM Activities

In future rate proceedings, SCE&G intends to request cost recovery for all IRP/DSM activities.

Appendices

A: Historic Economic Data

B: Forecast Economic Data

C: Energy Forecast Equations

D: Historic Gas Sales Data

E: Gas Sales Forecast

F: Peak Demand Forecast Equations

G: Peak Demand Forecast Tables

Appendix A: Historic Economic Data

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

HISTORICAL DATA FOR SERVICE AREA ECONOMIC VARIABLES

YEAR	SERVICE EMPLOYMENT (THOUSANDS)	REAL PER CAPITA INCOME (1982 $)	INDUSTRIAL PRODUCTION INDEX	HEATING DEGREE DAYS
1975	43.688	10311.20	0.609	1993.5
1976	47.286	10610.19	0.700	2423.0
1977	49.891	10765.06	0.751	2578.0
1978	54.323	11081.22	0.789	2547.5
1979	58.015	11281.84	0.818	2486.0
1980	61.196	11341.69	0.809	2771.5
1981	64.925	11553.19	0.818	2737.0
1982	68.003	11581.18	0.768	2215.0
1983	72.633	11803.88	0.846	2623.5
1984	80.048	12362.10	0.888	2247.0
1985	87.331	12727.73	0.872	2217.0
1986	94.485	13133.69	0.927	2089.5
1987	101.866	13336.42	1.000	2436.0
1988	108.409	13716.42	1.070	2524.0
1989	114.509	13601.23	1.106	2194.5
1990	124.965	14237.57	1.102	1488.5
1991	126.010	13835.67	1.086	1902.0
1992	129.105	13866.94	1.127	2193.0

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

HISTORIC REAL GAS AND OIL PRICES

YEAR	GAS RESIDENTIAL DOLLARS PER MMBTU	GAS COMMERCIAL FIRM DOLLARS PER MMBTU	GAS INDUSTRIAL FIRM DOLLARS PER MMBTU	GAS COMMERCIAL INTER. DOLLARS PER MMBTU	GAS INDUSTRIAL INTER. DOLLARS PER MMBTU	ALT. FUEL REAL PRICE INDEX (1974=100)
1975	0.47812	0.29478	0.18229	0.17415	0.17188	105.683
1976	0.44332	0.31454	0.22797	0.20786	0.21085	107.281
1977	0.48091	0.36143	0.25947	0.25208	0.25090	112.318
1978	0.51841	0.40650	0.31108	0.29704	0.29832	108.769
1979	0.53958	0.43944	0.37068	0.35820	0.36005	135.448
1980	0.59872	0.49825	0.38966	0.36617	0.37455	180.915
1981	0.62667	0.54[illegible]6	0.46159	0.43733	0.46411	195.664
1982	0.66422	0.58573	0.53220	0.49228	0.49757	173.923
1983	0.74671	0.68181	0.60207	0.52938	0.52764	151.509
1984	0.76554	0.69401	0.58131	0.54092	0.51841	141.060
1985	0.72053	0.65619	0.58976	0.49576	0.48845	129.475
1986	0.70423	0.66039	0.59927	0.43556	0.36695	81.700
1987	0.67194	0.64857	0.58343	0.40580	0.36424	83.906
1988	0.66877	0.61124	0.54317	0.36863	0.31576	76.410
1989	0.62950	0.58233	0.51985	0.34240	0.29906	82.827
1990	0.67054	0.61692	0.53593	0.33236	0.30150	96.107
1991	0.64190	0.59301	0.52707	0.29768	0.24112	82.641
1992	0.59457	0.54303	0.49549	0.27529	0.22519	77.185

Appendix B: Forecast Economic Data

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

FORECAST DATA FOR SERVICE AREA ECONOMIC VARIABLES

YEAR	SERVICE EMPLOYMENT (THOUSANDS)	REAL PER CAPITA INCOME (1982 $)	INDUSTRIAL PRODUCTION INDEX
1993	133.750	14.1519	1.933
1994	136.483	14.4334	2.023
1995	141.532	14.7388	2.058
1996	146.769	14.9065	2.122
1997	151.612	15.0476	2.186
1998	155.706	15.2222	2.232
1999	159.910	15.3698	2.284
2000	164.068	15.5270	2.338
2001	168.169	15.6797	2.392
2002	172.374	15.8141	2.455
2003	175.821	15.9641	2.526
2004	179.338	16.0926	2.588
2005	182.924	16.2382	2.639
2006	186.583	16.3816	2.690
2007	190.314	16.5501	2.755
2008	194.121	16.6888	2.807
2009	198.003	16.8000	2.859
2010	201.963	16.9491	2.916
2011	206.002	17.1086	2.974
2012	210.122	17.2958	3.030
2013	214.325	17.4853	3.084

Appendix C: Energy Forecast Equations

Variable Definitions

<u>Endogenous</u>

LAVGMl0	=	Residential Single Family Average Use
LAVGl3	=	Residential Apartment Average Use
LAVGl4	=	Residential Mobile Home Average Use
LCUST10	=	Residential Customers
ICUST20	=	Commercial Firm Customers
LMTHMS20	=	Commercial Firm Total Use
LMTHMS80	=	Commercial Interruptible Total Use
LMTHMS	=	Combined Industrial (Firm & Interruptible & Transport) Total Use

<u>Exogenous</u>

LSERVEMP	=	Service Area Service Employment
LJQIND	=	Industrial Production Index for South Carolina
LRPCI	=	Service Area Real Per Capita Income
LHDD	=	Annual Heating Degree Days
LREAFUEL	=	Real Price of #2 Fuel Oil
LRBTUG10	=	Real Price (BTU) Residential Gas
LRBTUG20	=	Real Price (BTU) Commercial Firm Gas
LRBTUG90	=	Real Price (BTU) Industrial Interruptible

Note:

(1) T-Statistics are shown in parenthesis under each variable in the equation.

(2) All equations were estimated in log-log form, using the natural logarithm of each variable.

Equations

Residential Average Usage (Single Family Dwellings)

Estimation Period: 1975 - 1992

Equation: $LAVGM10 = \underset{(4.44)}{2.183} - \underset{(-8.40)}{0.539} * LRBTUG10 + \underset{(8.12)}{0.521} * LHDD$

$+ \underset{(3.13)}{0.135} * DUM84$

Where: DUM84 = 1 in 1984; 0 otherwise

Statistics: R^2	=	0.92
Root MSE	=	0.039
Dependent Mean	=	6.48
Durbin-Watson	=	2.73

Equations

Residential Average Usage (Apartments)

Estimation Period: 1975 - 1992

Equation: LAVGM13 = 0.910 - 0.251 * LRBTUG10 + 0.670 * LHDD

(1.13) (-3.11) (6.46)

Statistics: R^2	=	0.77
Root MSE	=	0.065
Dependent Mean	=	6.21
Durbin-Watson	=	1.86

Residential Average Usage (Mobile Homes)

Estimation Period: 1975 - 1992

Equation: LAVGM14 = 2.056 - 0.431 * LRBTUG10 + 0.483 * LHDD

(4.61) (-5.09) (8.30)

+ 0.155 * DUM84

(8.30)

Where: DUM84 = 1 in 1984; 0 otherwise

Statistics: R^2	=	0.86
Root MSE	=	0.002
Dependent Mean	=	5.97
Durbin-Watson	=	2.40

Equations

Commercial Firm Customers

Estimation Period: 1975 - 1992

Equation: LCUST20 = 5.052 + 0.511 * LRPCI - 0.244 * DUMVAR
(3.85) (3.71) (-9.46)

- 0.158 * DUMPNG
(-8.65)

Where: DUMVAR = 1, TIME < 1985; 0 otherwise

Where: DUMPNG = 1, TIME < 1989; 0 otherwise

Statistics: R^2	=	0.99
Root MSE	=	0.024
Dependent Mean	=	9.59
Durbin-Watson	=	1.06

Commercial Firm Total Usage

Estimation Period: 1975 - 1992

Equation: LHTHMS20 = 3.254 - 0.225 * LRBTUG20 + 1.407 * LRPCI
(1.49) (-3.35) (7.72)

+ 0.150 * LHDD + 0.117 * DUM76
(1.82) (2.42)

Where: DUM76 = 1 in 1976; 0 otherwise

Statistics: R^2	=	0.84
Root MSE	=	0.041
Dependent Mean	=	7.81
Durbin-Watson	=	1.70

Equations

Commercial Interruptible Usage

Estimation Period: 1975 - 1992

Equation: LMTHMS80 = 15.400 + 0.107 * LREAFUEL

(28.90) (1.51)

+ 0.216 * LSERVEMP - 0.258 * DUMYR

(4.81) (-4.28)

Where: DUMYR = 1, TIME > 1988; 0 otherwise

Statistics: R^2	=	0.59
Root MSE	=	0.074
Dependent Mean	=	7.40
Durbin-Watson	=	1.44

Combined Industrial Usage (Firm, Interruptible, Transport)

Estimation Period: 1975 - 1992

Equation: LHTHMS = 17.346 - 0.616 * LRBTUG90

(129.22) (-6.78)

+ 0.578 * LJQIND + 1.104 * DUMVAR

(1.59) (8.45)

Where: DUMVAR = 1, TIME , 1987; 0 otherwise

Statistics: R^2	=	0.91
Root MSE	=	0.0147
Dependent Mean	=	18.62
Durbin-Watson	=	1.16

Appendix D: Historic Gas Sales Data

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

ACTUAL SALES DATA BY CLASS

1975 - 1992

THERMS IN THOUSANDS

YEAR	RESIDENTIAL SINGLE FAMILY	RESIDENTIAL APARTMENTS	RESIDENTIAL MOBILE HOMES	COMMERCIAL FIRM	INDUSTRIAL FIRM	COMMERCIAL INTERRUPTIBLE	INDUSTRIAL INTERRUPTIBLE	TRANSPORT
1975	76,603	12,138	2,884	49,390	49,292	35,146	210,074	.
1976	94,693	14,511	3,628	56,011	56,413	32,284	201,829	.
1977	90,251	13,887	3,519	49,836	53,599	28,254	198,969	.
1978	92,570	14,211	3,786	51,389	57,276	30,042	214,216	.
1979	82,292	12,645	3,550	47,260	65,764	36,602	238,135	.
1980	86,628	13,064	3,838	47,992	100,327	38,193	178,276	.
1981	85,722	12,887	4,068	48,507	113,543	37,432	155,450	.
1982	76,974	11,714	3,750	48,614	78,019	39,345	116,315	.
1983	79,517	11,861	4,056	51,025	91,576	39,653	114,088	.
1984	80,889	11,891	4,157	50,137	93,156	39,125	137,681	.
1985	76,062	10,105	3,656	56,808	28,553	37,129	53,783	.
1986	80,741	10,249	3,711	57,366	22,315	38,132	62,080	.
1987	93,721	11,445	4,194	59,149	16,815	44,043	70,824	946
1988	94,429	11,101	4,114	61,814	15,718	42,119	55,095	10,385
1989	90,433	10,747	3,887	57,691	12,925	34,336	58,885	11,959
1990	79,938	9,668	3,347	52,231	12,216	33,302	61,660	26,487
1991	88,657	10,511	3,439	58,689	9,724	34,903	70,744	40,938
1992	102,763	11,954	3,752	64,111	8,160	32,269	64,478	72,054

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

ACTUAL SALES DATA BY CLASS

1975 - 1992

CUSTOMERS

YEAR	RESIDENTIAL SINGLE FAMILY	RESIDENTIAL APARTMENTS	RESIDENTIAL MOBILE HOMES	COMMERCIAL FIRM	INDUSTRIAL FIRM	COMMERCIAL INTERRUPTIBLE	INDUSTRIAL INTERRUPTIBLE	TRANSPORT
1975	113,564	24,048	7,626	12,017	211	52	87	.
1976	115,276	24,025	7,845	12,001	218	56	89	.
1977	115,917	23,571	8,114	11,895	232	57	90	.
1978	116,900	23,550	8,392	11,793	241	54	96	.
1979	118,026	23,332	8,577	11,834	242	51	97	.
1980	119,665	23,033	8,899	12,003	258	46	90	.
1981	121,423	23,453	9,417	12,269	260	46	82	.
1982	122,809	23,421	9,852	12,470	285	48	86	.
1983	123,510	23,267	10,193	12,621	303	50	90	.
1984	124,140	23,189	10,425	12,938	301	54	91	.
1985	138,234	22,661	10,507	16,160	304	56	116	.
1986	139,919	22,565	10,471	16,574	284	57	122	.
1987	141,354	22,717	10,448	17,081	270	61	132	5
1988	144,769	22,701	10,370	17,600	267	83	125	10
1989	148,891	23,488	10,345	18,172	256	93	142	15
1990	152,194	24,641	10,203	18,503	254	94	143	34
1991	162,800	25,808	10,036	20,243	257	91	203	78
1992	168,218	27,212	9,987	21,050	268	106	199	159

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

ACTUAL SALES DATA BY CLASS

1975 - 1992

AVERAGE USE IN THOUSANDS OF THERMS

YEAR	RESIDENTIAL SINGLE FAMILY	RESIDENTIAL APARTMENTS	RESIDENTIAL MOBILE HOMES	COMMERCIAL FIRM	INDUSTRIAL FIRM	COMMERCIAL INTERRUPTIBLE	INDUSTRIAL INTERRUPTIBLE	TRANSPORT
1975	0.68	0.51	0.38	4.11	233.61	675.89	2,414.64	.
1976	0.82	0.60	0.46	4.67	258.78	576.50	2,267.74	.
1977	0.78	0.59	0.43	4.19	231.03	495.68	2,210.77	.
1978	0.79	0.60	0.45	4.36	237.66	556.33	2,231.42	.
1979	0.70	0.54	0.41	3.99	271.75	717.69	2,455.00	.
1980	0.72	0.57	0.43	4.00	388.86	830.28	1,980.84	.
1981	0.71	0.55	0.43	3.95	436.70	813.74	1,895.73	.
1982	0.63	0.50	0.38	3.90	273.75	819.69	1,352.50	.
1983	0.64	0.51	0.40	4.04	302.23	793.06	1,267.64	.
1984	0.65	0.51	0.40	3.88	309.49	724.54	1,512.98	.
1985	0.55	0.45	0.35	3.52	93.92	663.02	463.65	.
1986	0.58	0.45	0.35	3.46	78.57	668.98	508.85	.
1987	0.66	0.50	0.40	3.46	62.28	722.02	536.55	189.20
1988	0.65	0.49	0.40	3.51	58.87	507.46	440.76	1,038.50
1989	0.61	0.46	0.38	3.18	50.49	369.20	414.68	797.27
1990	0.53	0.39	0.33	2.82	48.09	354.28	431.19	779.03
1991	0.55	0.41	0.34	2.90	37.84	383.55	348.49	524.85
1992	0.61	0.44	0.38	3.05	30.45	304.43	324.01	453.17

Appendix E: Gas Sales Forecast

SOUTH CAROLINA ELECTRIC AND GAS COMPANY
LONG RUN GAS FORECAST
THROUGHPUT AND CUSTOMERS
THERMS IN THOUSANDS AND DECEMBER CUSTOMERS
WITH MARKETING ADJUSTMENTS INCLUDED

CUSTOMERS(DEC.)	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
RESIDENTIAL	215,729	217,876	220,753	224,196	228,010	231,265	234,469	237,623	240,725	243,777
COMMERCIAL FIRM	22,229	22,690	23,065	23,429	23,819	24,187	24,562	24,932	25,288	25,657
INDUSTRIAL FIRM	270	270	272	273	274	276	277	279	280	281
COMMERCIAL INT.	111	111	111	112	112	113	113	113	114	114
INDUSTRIAL INT.	196	196	197	198	199	200	201	202	202	203
INTERDEPT.	3	3	3	3	3	3	3	3	3	3
	238,538	241,146	244,401	248,211	252,417	256,044	259,625	263,152	266,612	270,035
TRANSPORT	205	205	209	213	217	221	224	228	232	235
TOTAL CUSTOMERS	238,743	241,351	244,610	248,424	252,634	256,265	259,849	263,380	266,844	270,270

THERMS(THOUSANDS)	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
RESIDENTIAL	131,893	133,899	135,895	138,002	141,114	142,447	143,515	144,478	145,392	146,148
COMMERCIAL FIRM	66,228	67,795	70,194	71,896	74,130	74,940	75,760	76,537	77,200	77,936
INDUSTRIAL FIRM	8,061	8,054	8,085	8,180	8,346	8,301	8,259	8,208	8,196	8,229
COMMERCIAL INT.	29,791	29,787	30,249	30,711	31,114	31,513	31,905	32,294	32,675	32,982
INDUSTRIAL INT.	63,477	64,949	68,991	70,006	71,221	70,869	70,532	70,136	70,041	70,304
INTERDEPT.	1,475	1,450	468	471	359	678	813	1,493	1,751	2,145
TOTAL SALES	300,925	305,934	313,882	319,266	326,284	328,748	330,784	333,146	335,255	337,744
TRANSPORT	80,184	81,234	81,458	81,258	80,677	80,325	79,989	79,593	79,497	79,761
THROUGHPUT	381,109	387,168	395,340	400,524	406,961	409,073	410,773	412,739	414,752	417,505

SOUTH CAROLINA ELECTRIC AND GAS COMPANY
LONG RUN GAS FORECAST
THROUGHPUT AND CUSTOMERS
THERMS IN THOUSANDS AND DECEMBER CUSTOMERS
WITH MARKETING ADJUSTMENTS INCLUDED

CUSTOMERS(DEC.)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
RESIDENTIAL	246,727	249,626	252,423	255,271	258,017	260,662	263,358	266,053	268,800	271,495
COMMERCIAL FIRM	26,007	26,371	26,731	27,111	27,468	27,805	28,168	28,540	28,929	29,321
INDUSTRIAL FIRM	282	284	285	286	287	288	289	290	291	292
COMMERCIAL INT.	114	114	115	115	115	115	116	116	116	116
INDUSTRIAL INT.	204	205	206	206	207	208	209	209	210	211
INTERDEPT.	3	3	3	3	3	3	3	3	3	3
	273,337	276,603	279,763	282,992	286,097	289,081	292,143	295,211	298,349	301,438
TRANSPORT	239	242	245	249	252	255	258	262	265	268
TOTAL CUSTOMERS	273,576	276,845	280,008	283,241	286,349	289,336	292,401	295,473	298,614	301,706

THERMS(THOUSANDS)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
RESIDENTIAL	146,827	147,683	148,636	149,550	150,391	151,394	152,533	153,547	154,523	155,577
COMMERCIAL FIRM	78,524	79,283	80,058	80,988	81,723	82,334	83,219	84,142	85,230	86,373
INDUSTRIAL FIRM	8,213	8,194	8,177	8,186	8,178	8,184	8,208	8,259	8,309	8,365
COMMERCIAL INT.	33,308	33,624	33,940	34,259	34,573	34,880	35,182	35,469	35,754	36,035
INDUSTRIAL INT.	70,179	70,024	69,895	69,966	69,904	69,950	70,136	70,533	70,927	71,368
INTERDEPT.	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
TOTAL SALES	339,051	340,808	342,706	344,949	346,769	348,742	351,278	353,950	356,743	359,718
TRANSPORT	79,635	79,481	79,352	79,423	79,360	79,407	79,593	79,989	80,384	80,824
THROUGHPUT	418,686	420,289	422,058	424,372	426,129	428,149	430,871	433,939	437,127	440,542

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

LONG RUN PROJECTIONS FOR GAS CUSTOMERS AND CONSUMPTION

TOTAL SYSTEM THROUGHPUT

YEAR	SALES IN THERMS
1993	387,313,795.00
1994	381,114,953.00
1995	387,168,678.00
1996	395,339,461.00
1997	400,524,733.00
1998	406,960,529.00
1999	409,073,353.00
2000	410,772,201.00
2001	412,739,278.00
2002	414,751,647.00
2003	417,505,676.00
2004	418,685,386.00
2005	420,288,554.00
2006	422,057,903.00
2007	424,371,643.00
2008	426,129,888.00
2009	428,148,244.00
2010	430,871,116.00
2011	433,938,332.00
2012	437,127,303.00
2013	440,543,265.00
1993-1994 C.G.R.	-1.60
1994-1995 C.G.R.	1.59
1993-1995 C.G.R.	-0.02
1993-2003 C.G.R.	0.75
2003-2013 C.G.R.	0.54
1993-2013 C.G.R.	0.65

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

LONG RUN PROJECTIONS FOR GAS CUSTOMERS AND CONSUMPTION

RESIDENTIAL CLASS SALES

FOR COMBINED DWELLING TYPES

YEAR	SALES IN THERMS
1993	130,387,890.00
1994	131,898,241.00
1995	133,903,619.00
1996	135,894,975.00
1997	138,002,784.00
1998	141,113,337.00
1999	142,446,831.00
2000	143,514,238.00
2001	144,477,783.00
2002	145,392,423.00
2003	146,148,445.00
2004	146,826,035.00
2005	147,682,720.00
2006	148,636,117.00
2007	149,549,753.00
2008	150,391,296.00
2009	151,393,911.00
2010	152,533,120.00
2011	153,547,585.00
2012	154,522,281.00
2013	155,577,649.00
1993-1994 C.G.R.	1.16
1994-1995 C.G.R.	1.52
1993-1995 C.G.R.	1.34
1993-2003 C.G.R.	1.15
2003-2013 C.G.R.	0.63
1993-2013 C.G.R.	0.89

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

LONG RUN PROJECTIONS FOR GAS CUSTOMERS AND CONSUMPTION

RESIDENTIAL CLASS CUSTOMERS

FOR COMBINED DWELLING TYPES

YEAR	ANNUAL AVERAGE CUSTOMERS
1993	209,086.00
1994	212,391.00
1995	214,848.00
1996	217,022.00
1997	220,407.00
1998	224,157.00
1999	227,357.00
2000	230,507.00
2001	233,607.00
2002	236,657.00
2003	239,657.00
2004	242,557.00
2005	245,407.00
2006	248,157.00
2007	250,957.00
2008	253,657.00
2009	256,257.00
2010	258,907.00
2011	261,557.00
2012	264,257.00
2013	266,907.00
1993-1994 C.G.R.	1.58
1994-1995 C.G.R.	1.16
1993-1995 C.G.R.	1.37
1993-2003 C.G.R.	1.37
2003-2013 C.G.R.	1.08
1993-2013 C.G.R.	1.23

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

LONG RUN PROJECTIONS FOR GAS CUSTOMERS AND CONSUMPTION

RESIDENTIAL CLASS CUSTOMERS

FOR COMBINED DWELLING TYPES

YEAR	AVERAGE USE IN THERMS
1993	624.00
1994	621.00
1995	623.00
1996	626.00
1997	626.00
1998	630.00
1999	627.00
2000	623.00
2001	618.00
2002	614.00
2003	610.00
2004	605.00
2005	602.00
2006	599.00
2007	596.00
2008	593.00
2009	591.00
2010	589.00
2011	587.00
2012	585.00
2013	583.00
1993-1994 C.G.R.	-0.48
1994-1995 C.G.R.	0.32
1993-1995 C.G.R.	-0.08
1993-2003 C.G.R.	-0.23
2003-2013 C.G.R.	-0.45
1993-2013 C.G.R.	-0.34

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

LONG RUN PROJECTIONS FOR GAS CUSTOMERS AND CONSUMPTION

RESIDENTIAL CLASS SALES

SINGLE FAMILY DWELLINGS

YEAR	SALES IN THERMS
1993	113,312,062.00
1994	114,671,498.00
1995	116,886,483.00
1996	118,776,191.00
1997	120,739,328.00
1998	123,684,568.00
1999	124,833,976.00
2000	125,737,639.00
2001	126,545,827.00
2002	127,310,007.00
2003	127,927,894.00
2004	128,475,605.00
2005	129,191,123.00
2006	129,999,151.00
2007	130,768,525.00
2008	131,473,665.00
2009	132,331,122.00
2010	133,314,117.00
2011	134,181,175.00
2012	135,009,592.00
2013	135,914,466.00
1993-1994 C.G.R.	1.20
1994-1995 C.G.R.	1.93
1993-1995 C.G.R.	1.57
1993-2003 C.G.R.	1.22
2003-2013 C.G.R.	0.61
1993-2013 C.G.R.	0.91

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

LONG RUN PROJECTIONS FOR GAS CUSTOMERS AND CONSUMPTION

RESIDENTIAL CLASS CUSTOMERS

SINGLE FAMILY DWELLINGS

YEAR	ANNUAL AVERAGE CUSTOMERS
1993	171,422.00
1994	174,717.00
1995	177,766.00
1996	179,686.00
1997	182,621.00
1998	185,884.00
1999	188,604.00
2000	191,282.00
2001	193,917.00
2002	196,510.00
2003	199,060.00
2004	201,525.00
2005	203,948.00
2006	206,286.00
2007	208,666.00
2008	210,961.00
2009	213,171.00
2010	215,424.00
2011	217,677.00
2012	219,972.00
2013	222,225.00
1993-1994 C.G.R.	1.92
1994-1995 C.G.R.	1.75
1993-1995 C.G.R.	1.83
1993-2003 C.G.R.	1.51
2003-2013 C.G.R.	1.11
1993-2013 C.G.R.	1.31

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

LONG RUN PROJECTIONS FOR GAS CUSTOMERS AND CONSUMPTION

RESIDENTIAL CLASS CUSTOMERS

SINGLE FAMILY DWELLINGS

YEAR	AVERAGE USE IN THERMS
1993	661.00
1994	656.00
1995	658.00
1996	657.00
1997	652.00
1998	647.00
1999	644.00
2000	639.00
2001	635.00
2002	630.00
2003	625.00
2004	620.00
2005	617.00
2006	613.00
2007	610.00
2008	607.00
2009	605.00
2010	603.00
2011	601.00
2012	598.00
2013	596.00
1993-1994 C.G.R.	-0.76
1994-1995 C.G.R.	0.31
1993-1995 C.G.R.	-0.23
1993-2003 C.G.R.	-0.56
2003-2013 C.G.R.	-0.47
1993-2013 C.G.R.	-0.52

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

LONG RUN PROJECTIONS FOR GAS CUSTOMERS AND CONSUMPTION

RESIDENTIAL CLASS SALES

APARTMENTS

YEAR	SALES IN THERMS
1993	13,144,194.00
1994	13,521,359.00
1995	13,532,501.00
1996	13,647,566.00
1997	13,826,003.00
1998	14,024,773.00
1999	14,234,853.00
2000	14,428,906.00
2001	14,615,054.00
2002	14,796,063.00
2003	14,966,268.00
2004	15,127,567.00
2005	15,295,623.00
2006	15,464,150.00
2007	15,632,486.00
2008	15,792,458.00
2009	15,956,533.00
2010	16,129,895.00
2011	16,296,435.00
2012	16,462,787.00
2013	16,631,232.00
1993-1994 C.G.R.	2.87
1994-1995 C.G.R.	0.08
1993-1995 C.G.R.	1.47
1993-2003 C.G.R.	1.31
2003-2013 C.G.R.	1.06
1993-2013 C.G.R.	1.18

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

LONG RUN PROJECTIONS FOR GAS CUSTOMERS AND CONSUMPTION

RESIDENTIAL CLASS CUSTOMERS

APARTMENTS

YEAR	ANNUAL AVERAGE CUSTOMERS
1993	27,894.00
1994	28,241.00
1995	28,242.00
1996	28,514.00
1997	28,994.00
1998	29,514.00
1999	30,026.00
2000	30,530.00
2001	31,026.00
2002	31,514.00
2003	31,994.00
2004	32,458.00
2005	32,914.00
2006	33,354.00
2007	33,802.00
2008	34,234.00
2009	34,650.00
2010	35,074.00
2011	35,498.00
2012	35,930.00
2013	36,354.00
1993-1994 C.G.R.	1.24
1994-1995 C.G.R.	0.00
1993-1995 C.G.R.	0.62
1993-2003 C.G.R.	1.38
2003-2013 C.G.R.	1.29
1993-2013 C.G.R.	1.33

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

LONG RUN PROJECTIONS FOR GAS CUSTOMERS AND CONSUMPTION

RESIDENTIAL CLASS CUSTOMERS

APARTMENTS

YEAR	AVERAGE USE IN THERMS
1993	471.00
1994	479.00
1995	479.00
1996	479.00
1997	477.00
1998	475.00
1999	474.00
2000	473.00
2001	471.00
2002	470.00
2003	468.00
2004	466.00
2005	465.00
2006	464.00
2007	462.00
2008	461.00
2009	461.00
2010	460.00
2011	459.00
2012	458.00
2013	457.00
1993-1994 C.G.R.	1.70
1994-1995 C.G.R.	0.00
1993-1995 C.G.R.	0.85
1993-2003 C.G.R.	-0.06
2003-2013 C.G.R.	-0.24
1993-2013 C.G.R.	-0.15

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

LONG RUN PROJECTIONS FOR GAS CUSTOMERS AND CONSUMPTION

RESIDENTIAL CLASS SALES

MOBILE HOMES

YEAR	SALES IN THERMS
1993	3,931,634.00
1994	3,705,384.00
1995	3,484,635.00
1996	3,471,218.00
1997	3,437,453.00
1998	3,403,996.00
1999	3,378,002.00
2000	3,347,693.00
2001	3,316,902.00
2002	3,286,353.00
2003	3,254,283.00
2004	3,222,863.00
2005	3,195,974.00
2006	3,172,816.00
2007	3,148,742.00
2008	3,125,173.00
2009	3,106,256.00
2010	3,089,108.00
2011	3,069,975.00
2012	3,049,902.00
2013	3,031,951.00
1993-1994 C.G.R.	-5.76
1994-1995 C.G.R.	-5.96
1993-1995 C.G.R.	-5.86
1993-2003 C.G.R.	-1.87
2003-2013 C.G.R.	-0.71
1993-2013 C.G.R.	-1.29

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

LONG RUN PROJECTIONS FOR GAS CUSTOMERS AND CONSUMPTION

RESIDENTIAL CLASS CUSTOMERS

MOBILE HOMES

YEAR	ANNUAL AVERAGE CUSTOMERS
1993	9770.00
1994	9433.00
1995	8840.00
1996	8822.00
1997	8792.00
1998	8759.00
1999	8727.00
2000	8695.00
2001	8664.00
2002	8633.00
2003	8603.00
2004	8574.00
2005	8545.00
2006	8517.00
2007	8489.00
2008	8462.00
2009	8436.00
2010	8409.00
2011	8382.00
2012	8355.00
2013	8328.00
1993-1994 C.G.R.	-3.45
1994-1995 C.G.R.	-6.29
1993-1995 C.G.R.	-4.88
1993-2003 C.G.R.	-1.26
2003-2013 C.G.R.	-0.32
1993-2013 C.G.R.	-0.80

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

LONG RUN PROJECTIONS FOR GAS CUSTOMERS AND CONSUMPTION

RESIDENTIAL CLASS CUSTOMERS

MOBILE HOMES

YEAR	AVERAGE USE IN THERMS
1993	402.00
1994	393.00
1995	394.00
1996	393.00
1997	391.00
1998	389.00
1999	387.00
2000	385.00
2001	383.00
2002	381.00
2003	378.00
2004	376.00
2005	374.00
2006	373.00
2007	371.00
2008	369.00
2009	368.00
2010	367.00
2011	366.00
2012	365.00
2013	364.00
1993-1994 C.G.R.	-2.24
1994-1995 C.G.R.	0.25
1993-1995 C.G.R.	-1.00
1993-2003 C.G.R.	-0.61
2003-2013 C.G.R.	-0.38
1993-2013 C.G.R.	-0.50

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

LONG RUN PROJECTIONS FOR GAS CUSTOMERS AND CONSUMPTION

COMMERCIAL FIRM CLASS SALES

YEAR	SALES IN THERMS
1993	67,603,883.00
1994	66,226,632.00
1995	67,794,100.00
1996	70,194,198.00
1997	71,895,511.00
1998	74,130,127.00
1999	74,940,258.00
2000	75,760,246.00
2001	76,536,975.00
2002	77,199,623.00
2003	77,935,926.00
2004	78,523,600.00
2005	79,283,087.00
2006	80,057,797.00
2007	80,987,684.00
2008	81,722,998.00
2009	82,333,601.00
2010	83,218,525.00
2011	84,141,504.00
2012	85,230,146.00
2013	86,373,274.00
1993-1994 C.G.R.	-2.04
1994-1995 C.G.R.	2.37
1993-1995 C.G.R.	0.14
1993-2003 C.G.R.	1.43
2003-2013 C.G.R.	1.03
1993-2013 C.G.R.	1.23

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

LONG RUN PROJECTIONS FOR GAS CUSTOMERS AND CONSUMPTION

TOTAL FIRM SALES

YEAR	SALES IN THERMS
1993	206,614,415.00
1994	206,188,460.00
1995	209,753,928.00
1996	214,174,196.00
1997	218,078,735.00
1998	223,589,873.00
1999	225,688,585.00
2000	227,533,032.00
2001	229,222,717.00
2002	230,787,811.00
2003	232,313,794.00
2004	233,563,041.00
2005	235,159,469.00
2006	236,871,116.00
2007	238,723,739.00
2008	240,292,606.00
2009	241,911,728.00
2010	243,959,645.00
2011	245,947,668.00
2012	248,061,413.00
2013	250,316,132.00
1993-1994 C.G.R.	-0.21
1994-1995 C.G.R.	1.73
1993-1995 C.G.R.	0.76
1993-2003 C.G.R.	1.18
2003-2013 C.G.R.	0.75
1993-2013 C.G.R.	0.96

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

LONG RUN PROJECTIONS FOR GAS CUSTOMERS AND CONSUMPTION

COMMERCIAL INTERRUPTIBLE CLASS SALES

YEAR	SALES IN THERMS
1993	29,190,730.00
1994	29,783,000.00
1995	29,779,000.00
1996	30,248,513.00
1997	30,710,504.00
1998	31,113,744.00
1999	31,512,524.00
2000	31,905,099.00
2001	32,294,399.00
2002	32,675,122.00
2003	32,981,798.00
2004	33,308,337.00
2005	33,624,387.00
2006	33,939,973.00
2007	34,258,522.00
2008	34,573,072.00
2009	34,879,818.00
2010	35,182,147.00
2011	35,468,946.00
2012	35,754,454.00
2013	36,034,875.00
1993-1994 C.G.R.	2.03
1994-1995 C.G.R.	-0.01
1993-1995 C.G.R.	1.00
1993-2003 C.G.R.	1.23
2003-2013 C.G.R.	0.89
1993-2013 C.G.R.	1.06

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

LONG RUN PROJECTIONS FOR GAS CUSTOMERS AND CONSUMPTION

INDUSTRIAL INTERRUPTIBLE CLASS SALES

YEAR	SALES IN THERMS
1993	63,711,480.00
1994	63,481,750.00
1995	64,953,800.00
1996	68,991,461.00
1997	70,006,392.00
1998	71,220,616.00
1999	70,868,792.00
2000	70,532,370.00
2001	70,136,086.00
2002	70,040,572.00
2003	70,304,227.00
2004	70,178,754.00
2005	70,024,099.00
2006	69,895,157.00
2007	69,966,441.00
2008	69,903,855.00
2009	69,950,099.00
2010	70,136,412.00
2011	70,532,609.00
2012	70,927,468.00
2013	71,367,879.00
1993-1994 C.G.R.	-0.36
1994-1995 C.G.R.	2.32
1993-1995 C.G.R.	0.97
1993-2003 C.G.R.	0.99
2003-2013 C.G.R.	0.15
1993-2013 C.G.R.	0.57

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

LONG RUN PROJECTIONS FOR GAS CUSTOMERS AND CONSUMPTION

TRANSPORT VOLUMES

YEAR	SALES IN THERMS
1993	84,090,750.00
1994	80,186,803.00
1995	81,231,800.00
1996	81,457,511.00
1997	81,258,442.00
1998	80,677,116.00
1999	80,325,292.00
2000	79,988,870.00
2001	79,592,586.00
2002	79,497,072.00
2003	79,760,727.00
2004	79,635,254.00
2005	79,480,599.00
2006	79,351,657.00
2007	79,422,941.00
2008	79,360,355.00
2009	79,406,599.00
2010	79,592,912.00
2011	79,989,109.00
2012	80,383,968.00
2013	80,824,379.00
1993-1994 C.G.R.	-4.64
1994-1995 C.G.R.	1.30
1993-1995 C.G.R.	-1.72
1993-2003 C.G.R.	-0.53
2003-2013 C.G.R.	0.13
1993-2013 C.G.R.	-0.20

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

LONG RUN PROJECTIONS FOR GAS CUSTOMERS AND CONSUMPTION

TOTAL INTERRUPTIBLE SALES

INCLUDING TRANSPORT AND INTERDEPARTMENTAL SALES

YEAR	SALES IN THERMS
1993	180,699,380.00
1994	174,926,493.00
1995	177,414,750.00
1996	181,165,265.00
1997	182,445,998.00
1998	183,370,656.00
1999	183,384,768.00
2000	183,239,169.00
2001	183,516,561.00
2002	183,963,836.00
2003	185,191,882.00
2004	185,122,345.00
2005	185,129,085.00
2006	185,186,787.00
2007	185,647,904.00
2008	185,837,282.00
2009	186,236,516.00
2010	186,911,471.00
2011	187,990,664.00
2012	189,065,890.00
2013	190,227,133.00
1993-1994 C.G.R.	-3.20
1994-1995 C.G.R.	1.42
1993-1995 C.G.R.	-0.91
1993-2003 C.G.R.	0.25
2003-2013 C.G.R.	0.27
1993-2013 C.G.R.	0.26

Appendix F: Peak Demand Forecast Equations

Models For Daily Average Use

SCE&G Residential Models - Rate 32 (Single Family Dwellings)

Where: DAVGT = Daily Average Use Per Customer
DHDD = Daily HDD

Estimation Period = January 1988 - March 1994
(Months of January - March, November and December)

Equation: $DAVGT = 0.347 + 0.228 * DHDD$
(3.54) (30.20)

Statistics: $R^2 = 0.97$

Root MSE = 0.17

Dependent Mean = 3.14

Durbin-Watson = 2.22

SCE&G Residential Models - Rate 32 (Apartments)

Equation: $DAVGT = 0.298 + 0.151 * DHDD$
(4.63) (30.54)

Statistics: $R^2 = 0.97$

Root MSE = 0.12

Dependent Mean = 2.16

Durbin-Watson = 2.06

SCE&G Residential Models - Rate 32 (Mobile Homes)

Equation: $$\underset{(7.31)}{DAVGT = 0.35} + \underset{(32.68)}{0.12} * DHDD$$

Statistics: $R^2 = 0.97$

Root MSE = 0.99

Dependent Mean = 1.84

Durbin-Watson = 1.99

SCE&G Commercial Models - Rate 31

Equation: $$\underset{(8.50)}{DAVGT = 3.466} + \underset{(18.25)}{0.571} * DHDD$$

Statistics: $R^2 = 0.91$

Root MSE = 0.78

Dependent Mean = 10.48

Durbin-Watson = 1.89

SCE&G Commercial Models - Rate 34

Equation: $$\underset{(14.77)}{DAVGT = 271.654} + \underset{(10.69)}{21.810} * DHDD$$

Statistics: $R^2 = 0.83$

Root MSE = 39.87

Dependent Mean = 448.97

Durbin-Watson = 1.31

SCE&G Industrial Models - Rate 31

Equation: $$\underset{(4.37)}{\text{DAVGT} = 12.308} + \underset{(12.88)}{2.804} * \text{DHDD} + \underset{(4.07)}{22.398} * \text{D9402}$$

$$+ \underset{(3.55)}{19.236} * \text{D9012}$$

Where: D9012 = 1 in December 1990, 0 otherwise

D9402 = 1 in February 1994, 0 otherwise

Statistics: $R^2 = 0.87$

Root MSE = 5.31

Dependent Mean = 47.97

Durbin-Watson = 2.26

SCE&G Industrial Models - Rate 34

Equation: $$\text{DAVGT} = \underset{(14.41)}{395.606} + \underset{(10.61)}{32.285} * \text{DHDD}$$

Statistics: $R^2 = 0.82$

Root MSE = 59.47

Dependent Mean = 658.09

Durbin-Watson = 1.49

Models For Winter 1993-1994 Daily Gas Sendout

Small Gas Users - Rates 31 and 32

Estimation Period: December 1993, January-February 1994, for days with small user sendout greater than 160,000 MCF (N=24)

Equation: SENDOUT = 101,997 - 157,895 * HDDADDER + 2214.450 * HDD
(10.67) (-1.90) (7.44)

+ 4654.995 * HDDPLUS + 582.287 * LHDD
(2.24) (3.72)

Statistics: $R^2 = 0.95$

Root MSE = 5,110.54

Dependent Mean = 184,766.57

Durbin-Watson = 1.48

Where: SENDOUT = Daily small user sendout

HDDADDER = 1 on all days with HDD greater than 35, 0 otherwise

HDD = daily HDD

HDDPLUS = HDDADDER * HDD

LHDD = Prior day HDD

Large Gas Users - Rates 34 and 35

Estimation Period: December 1993, January-February 1994, for days with large user sendout greater than 8,000 MCF (N=17)

Equation: SENDOUT = 518.797 - 157.895 * HDD + 94.449 * LHDD
(0.33) (5.75) (2.62)

- 4523.503 * WEEKEND
(-5.05)

Statistics: $R^2 = 0.75$

Root MSE = 1,210.09

Dependent Mean = 10,466.41

Durbin-Watson = 2.26

Where: SENDOUT = Daily large user sendout

HDD = daily HDD

LHDD = prior day HDD
WEEKEND = 1 if day is Saturday or Sunday, 0 otherwise

Appendix G: Peak Demand Forecast Tables

Table 2:
Calculation of Contribution to Gas Peak Demand by Rate
Using Models Developed May 1994

CATEGORY	CUSTOMERS	MODEL AVG DT/CUST	PEAK DAY HDD	MCF CATEGORY DEMAND	ADJUSTED DEMAND	% WEIGHTS
single-family	174931	1.00675	42.25	171816.3749	169779.7941	66.95816553
multi-family	28444	0.66375		18419.22439	18200.8969	7.178113707
mobile homes	9749	0.542		5155.080976	5093.976562	2.008974788
small commercial	21876	2.75525		58803.75512	58106.74008	22.91627659
small industrial	189	13.06		2408.136585	2379.592364	0.938469388
			model peak	256602.572	253561	100

actual peak 253561
wednesday jan. 19, 1994

ratio= 0.98814676

CATEGORY	WEIGHTED AVG DT/CUST
single-family	0.970552927
multi-family	0.63988528
mobile homes	0.522512726
small commercial	2.656186692
small industrial	12.59043579

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Table 3:
Creation of Weighted Peak Day Use Per Customer Equations For Use in Forecast

DAILY MODEL EQUATION COEFFICIENTS
(IN MCFs)

	intercept	hddsq	hdd	hddlagged
	158008	117.082	-3208.572	636.478

WEIGHTED DAILY EQUATION COEFFICIENTS
ON A PER CUSTOMER BASIS

CATEGORY					ADJ. DEMAND WEIGHT	JAN. 94 CUSTOMERS
single-family	0.604822226	0.000448166	-0.012281756	0.002436307	0.6696	174931
multi-family	0.398852988	0.000295545	-0.008099264	0.001606635	0.0718	28444
mobile homes	0.325772982	0.000241394	-0.006615273	0.001312258	0.0201	9749
small commercial	1.655486999	0.001226696	-0.033616964	0.00666853	0.2292	21876
small industrial	7.858598942	0.005823126	-0.159579771	0.03165552	0.0094	189

DAILY MODEL EQUATION COEFFICIENTS
(IN MCFs)

	intercept	hdd	hddlagged	weekend
	519	286.877	94.449	-4524

WEIGHTED DAILY EQUATION COEFFICIENTS
ON A PER CUSTOMER BASIS

CATEGORY					ADJ. DEMAND WEIGHT	JAN. 94 CUSTOMERS
large commercial	3.749775	2.072686325	0.682394025	-32.6859	0.3757	52
large industrial	5.452095	3.013642885	0.992186745	-47.52462	0.4202	40
omm. firm transport	3.749775	2.072686325	0.682394025	-32.6859	0.1734	24
ind. firm transport	0.407215385	0.225088108	0.074106138	-3.5496	0.0306	39

Table 4:
Residential Furnace Efficiency Impacts

Single-Family

	10.95	Total therm use on 46.6 HDD peak day
-	0.84	Less water heater use
=	10.11	Equals space-heat use
	10.11	
x	0.64	Assume current furnace is 64% efficient
=	6.47	Input heat to single-family residence
	6.47	
/	0.78	Assume new furnace is 78% efficient
=	8.30	
	8.30	Space-heat with 78% efficient furnace
	1.81	Decrease in load due to new furnace

Multi-Family

	7.35	Total therm use on 46.6 HDD peak day
-	0.56	Less water heater use
=	6.79	Equals space-heat use
	6.79	
x	0.64	Assume current furnace is 64% efficient
=	4.34	Input heat to single-family residence
	4.34	
/	0.78	Assume new furnace is 78% efficient
=	5.57	
	5.57	Space-heat with 78% efficient furnace
	1.22	Decrease in load due to new furnace

Note: Water heater use reduced in proportion to reduction in total therm use.

ile Home

	6.00	Total therm use on 46.6 HDD peak day
-	0.46	Less water heater use
=	5.54	Equals space-heat use
	5.54	
x	0.64	Assume current furnace is 64% efficient
=	3.55	Input heat to single-family residence
	3.55	
/	0.78	Assume new furnace is 78% efficient
=	4.55	
	4.55	Space-heat with 78% efficient furnace
	0.99	Decrease in load due to new furnace

Note: Water heater use reduced in proportion to reduction in total therm use.

Chart 1:
Firm Gas Loads and HDD
For Winter 1993 – 1994